

12-16-2013

Relationship Between the Experience of Perceived and Physician Diagnosed Arthritis and the Presence of DSM-IV Criteria-based Major Depression (MDD) Among Older

Ryan Neil Schmidt

University of South Carolina - Columbia

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Relationship Between the Experience of Perceived and Physician Diagnosed Arthritis and
the Presence of DSM-IV Criteria-based Major Depression (MDD) Among Older Adults.

by

Ryan Neil Schmidt

Bachelor of Arts
Montana State University – Bozeman, 2002

Master of Arts
Louisiana Tech University, 2007

Master of Science
Texas Tech University Health Sciences Center, 2010

Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Philosophy in

Health Services Policy and Management

The Norman J. Arnold School of Public Health

University of South Carolina

2013

Accepted by:

Janice C. Probst, Major Professor

Sandra Glover, Committee Member

Sudha Xirasagar, Committee Member

James Hardin, Committee Member

Lacy Ford, Vice Provost and Dean of Graduate Studies

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DEDICATION

First and foremost, I thank God for giving me the strength and determination to complete such a project. Our journey together has been great and I am thankful for the mindfulness to push me towards your divine end; whatever that may be.

In honor of my mother (Verlayne); thank you for your love and compassion for your children. Although your time with us here was cut short of our expectations, you taught me much and your life lives on through your children.

To my father (Robert); thank you for taking the hard road and raising me through circumstances of challenge. I fully understand what you have done for me and I am forever thankful for you and your leadership.

To my wife (Serap); we have been through much and you stayed strong through it all when things seemed to be in a constant state of uncertainty. I love you for that and will be with you forever; my partner and best friend.

To my children; (Cole, Sierra, and Kenan); you sacrificed much during my periods of work and study; you are the best children I could have ever asked for and I am truly a blessed man.

To all those persons who mentored me both in and out of military service; your investment in me has paid dividends; keep doing what you do to better others.

ACKNOWLEDGEMENTS

Special thanks to Dr. Jan Probst; your mentorship and service on my dissertation committee and as my dissertation chair was much appreciated.

I would also like to thank the other members of my committee: Dr. Sandra Glover, Dr. Sudha Xirasagar, and Dr. James Hardin. Your continual support throughout the dissertation process was outstanding and I certainly could not have done it without your timely comments and feedback.

The words of encouragement from Dr. Sarah Laditka need to be recognized. Every single time I was discouraged or distracted, the words of “keep going” continued to create circular direction towards completion.

Much appreciation to Dr. JD Baek; you were always there when I needed a quality assurance check and review. I appreciate both our professional relationship and our friendship throughout the course of doctoral studies and beyond.

To the faculty within the Department of Philosophy at Montana State University – Bozeman; thank you for preparing such a strong undergraduate foundational education equipping me to succeed at the highest level and reach goals beyond imagination.

ABSTRACT

BACKGROUND: The purpose of this study was to explore both positive screened MDD and the perception of being depressed (P) and the likelihood of either increasing if the patient suffered from arthritis (P/E), either perceived or evaluated by a physician. The study explored the univariate, bivariate, and multivariate relationships between MDD and depression (P) to better describe influencing characteristics and their prevalence, as related to MDD and depression (P).

METHODS: The study examined a cross section of patients 65 years and older (n=8,205) within the National Epidemiologic Survey on Alcohol Abuse and Alcoholism (NESARC) [2001-02] sponsored by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). A multivariate analysis was conducted using SAS Callable SUDAAN to account for the complex design of the study and adjusted odds ratios (ORs) of modeling were computed to account for Models 1-4.

RESULTS: Those persons age 65 and older who report having arthritis (P/E) were significantly more likely to be suffering from MDD than those who have not reported having an arthritic condition (P/E) [results were positive within Models 2-4]. Those persons age 65 and older who report having arthritis (P/E) were not significantly more likely to be suffering from depression (P) than those who have not reported having an arthritic condition (P/E) [results were negative within Models 2-4].

This creates significant concern, given that each of the multivariate models (2-4) examined arthritis (P/E) while utilizing the same control variables throughout. Further,

many of the relationally significant variables in the MDD versus depression (P) models were not the same (Table 4.4 /4.5).

CONCLUSION: This study demonstrated a significant difference within the senior population between those with arthritis (P/E) and those who have positively screened MDD and depression (P). Seniors with arthritis (P/E) seem to respond differently with regards to positively screened MDD and depression (P). The results demonstrated conclusive evidence that one cannot count on an elderly patient to have a positive perception of depression as it relates to being positively screened for MDD. Further, it would appear that older persons may not disclose whether or not they are depressed in a clinical environment. This becomes important to clinicians and further demonstrated the need for clinically valid assessment measures to ensure preventative measures are being taken to address elderly depression.

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CHAPTER ONE: INTRODUCTION

1.1 PROBLEM STATEMENT

Depression extends its reach to both the social and economic impact with disregard to geographic boundaries. The World Health Organization (WHO) reports that depression is the leading cause of disability as measured by Years Lived with Disability (YLDs) and the fourth leading contributor to the global burden of disease in 2000 ("Report on Mental Illness" 2001). Additionally, in 2012, the WHO identified that depression impacts 350 million persons worldwide. By the year 2020, depression is projected to reach second place of the ranking of Disability Adjusted Life Years (DALYs) calculated for all ages and for both sexes ("Report on Mental Illness" 2001). Economically, depression displays similar crippling statistics as it relates to businesses and their ability to sustain productive employees. Depression results in more absenteeism than almost any other physical disorder and costs the U.S. employers more than \$51 billion per year in absenteeism and lost productivity, not including high medical and pharmaceutical bills ("The Societal Promise of Improving Care for Depression" 2004).

The critical combination encompassing disability and cost stimulates the focus of my concern on the elderly population and its growing numbers within the United States. Since 1900, the percentage of Americans 65+ has tripled (from 4.1 percent in 1900 to 12.8 percent in 2008), and the absolute number of older persons has increased twelve times (from 3.1 million to 38.9 million) ("A Profile of Older Americans: 2009" 2009).

The elderly population's massive growth is a tribute to technological and medical advances, however the increases in age allow for longer periods of chronic and disabling diseases. Some type of disability (sensory disability, physical disability, or mental disability) was reported by 52 percent of older persons in 2002 ("A Profile of Older Americans: 2007" 2007).

Moreover, the elderly adult also has an increased likelihood to suffer from arthritis and other rheumatic conditions (AORC) due to the processes of aging. According to the Centers of Disease Control and Prevention (CDC), arthritis is the leading cause of disability in the U.S. and is associated with substantial activity limitation, work disability, reduced quality of life, and high healthcare costs. Arthritis is expected to affect an estimated 67 million adults in the U.S. by 2030 (Hootman & Helmick 2006), and a 2003 report generated by the CDC suggests total cost of AORC to be \$128 billion, 1.2 percent of the gross domestic product (GDP) during that year (Yelin et al. 2007). The CDC also suggests the prevalence of doctor-diagnosed arthritis among adults was estimated at 21.6 percent, or 46.4 million persons. Prevalence was higher among women (25.4 percent) compared with men (17.6 percent), older age groups (50 percent for persons aged ≥ 65 years and 29.3 percent for persons aged 45 to 64 years) compared with younger age groups (7.9 percent for persons aged 18 to 44 years).

In 2004, 36.7 percent of noninstitutionalized persons age 65 and older claimed their health was good or excellent (Chop 2009). The majority (80 percent) of elderly persons have at least one chronic condition (Chop 2009). In 2002-2003, the most frequently occurring conditions among older adults were hypertension (51 percent),

diagnosed arthritis (48 percent), heart disease (31 percent), cancer of any type (21 percent), diabetes (16 percent), and sinusitis (14 percent) (Chop 2009).

As the population of the U.S. ages, the portion of that population with AORC and MDD will increase. Appropriate treatment methods are needed to focus both on physiologic care as well as palliative care for those suffering from AORC. My hypothesis suggests an increased likelihood for those elderly who suffer from AORC to also suffer from major depressive disorder (MDD) if appropriate preventative treatment and/or palliative care are not administered. If treatment is overlooked, the combined societal costs to treat elderly persons suffering from both AORC and MDD will be significant.

1.1.1 AGING POPULATION

Demographics:

In 1900, only 4 percent, or 1 in 25, of Americans were older than 65 years of age (Chop 2009). In 2008, the older population numbers 38.9 million and represented 12.8 percent of the U.S. population (over one in every eight Americans). The number of older Americans has increased by 4.5 million or 13.0 percent since 1998, compared to an increase of 12.4 percent for the under-65 population. However, the number of Americans aged 45-64 – who will reach 65 over the next two decades – increased by 31 percent during this period ("A Profile of Older Americans: 2009," 2009). The population of those older than 65 years has increased by more than 2 million people (7 percent of the population) since 1990, while the younger-than-65 age group increased by only 4 percent (Chop 2009). A child born in 2007 could expect to live 77.9 years, about 30 years longer than a child born in 1900. Life expectancy at age 65 increased by only 2.5 years between

1900 and 1960, but has increased by 4.2 years from 1960 to 2007 ("A Profile of Older Americans: 2009" 2009). Projections for the year 2030 estimate that 22 percent, or 70.2 million, of Americans will be older than the age of 65. An even more dramatic aging trend exists among those older than 85 years of age, often referred to as the old-old. This age cohort is expected to double – from 4.7 million in 2003 to 9.6 million in 2030 – and double again to 20.9 million in 2050 (Chop 2009). The percentage of persons age 85 and over is growing faster than any other age group (Haber 2010) while the average life expectancy for an infant born in the United States (U.S.) today is 77 years, a dramatic increase from 1900, when life expectancy was 47 years (Hetzl & Leeder 2001).

1.1.2 DEPRESSION

Prevalence:

It is estimated that by 2030, more than 15 million older adults will experience a mental illness. That is nearly double the current number (Jeste et al. 1999). One-quarter of today's older adults experience some mental disorder, including dementia. About 16 percent have psychiatric disorders, and about 10 percent have dementia. A third of those with dementia exhibit psychosis and/or depression, and they represent about 3 percent of the total elderly population (Jeste et al. 1999). An estimated 46.4 percent of Americans will experience some form of mental illness in their lifetime (Kessler et al. 2005). Given a current U.S. population of more than 305 million, that figure represents an estimated 141 million Americans.

Lifetime prevalence of depressive disorders range from 5 percent to 17 percent (Williams et al. 2002) and depression is projected to become the second leading cause of disability worldwide by the year 2020. Prevalence estimates of depression vary based on

the particular dataset, control variables, and the analysis/impact of comorbid relationships. The risk of depression in the elderly increases with other illnesses and when the ability to function becomes limited. Estimates of major depression in older people living in the community range from less than 1 percent to about 5 percent, but rises to 13.5 percent in those who require home healthcare and to 11.5 percent in elderly hospital patients (Hybels & Blazer 2003). A lifetime prevalence rate for major depression of 16 percent was identified for those in age ranges between 18 and above (Kessler et al. 2003). It was also determined that all age ranges below 60 years of age were more likely to experience lifetime major depression than those 60 years and above (Kessler et al. 2003). Moreover, another study also suggested the lifetime prevalence of major depression was 17 percent, however, the age ranges used were 15-54 years of age (Blazer 1994). A separate study focused on nursing home patients while producing a major depression prevalence rate of 17 percent. (Davison et al. 2007). While other studies identify point estimates, 30-day prevalence rates, and 12-month instances of major depression, the focus of this study is on the older population, and the lifetime prevalence rates of major depression as it related the DSM-IV criteria-based measurements.

Chronic Conditions/Comorbidity:

The most likely causes of depression in later life are the loss of a spouse or other family support, chronic medical conditions and pain, loss of functional independence; and difficulty adapting to changing circumstances within the home, family, or living situation (Lantz 2002). These emotional and physical losses not only can lead to depression, but depression in turn can lead to disease, physical decline, and disability

(Brenes et al. 2008). Social phobia was the most common comorbid disorder among elderly with depression, and depression was the most common comorbid disorder among the elderly with any of the anxiety disorders (Cairney et al. 2008). Although comorbid relationships exist and are well documented between depression and physical health conditions and dementia, comorbid relationships also exist with regards to anxiety in the elderly population (Cairney et al. 2008). Comorbid anxiety disorder diagnoses were present in nearly 51 percent of patients with major depression (Fava et al. 2000). Comorbid anxiety disorders both precede and follow major depression while their influence on depression remains apparent (Fava et al. 2000). Causality, from an epidemiological standpoint, is difficult to identify given the subjective diagnosis within psychological evaluation. It is important to recognize that comorbid psychological effects exist within diagnosis without particular understanding of causality.

1.1.3 ARTHRITIS

Prevalence:

Arthritis is the nation's most common cause of disability and comprises more than 100 different rheumatic diseases and conditions, the most common of which is osteoarthritis. Arthritis affects all race and ethnic groups: 36 million whites, 4.6 million blacks, 2.9 million Hispanics, 280,000 American Indians/Alaska Natives, 667,000 Asian/Pacific Islanders, and 469,000 multiracial/others (Bolen et al. 2010). According to the CDC, 46 million (22 percent) of adults have self-reported doctor-diagnosed arthritis and 19 million (9 percent of all adults) have arthritis and arthritis-attributable activity limitation. By 2030, 67 million (25 percent) adults aged 18 years and older will have doctor-diagnosed arthritis and estimated 25 million adults (37 percent) of those with

arthritis will report arthritis-attributable activity limitations. These results were analyzed by the CDC in review of the National Health Interview Survey (NHIS) from data collected between 2007-2009 (Health Data Interactive 2011).

Costs/Impact:

In 2003, the total cost of arthritis was \$128 billion, including \$81 billion in direct costs (medical) and \$47 billion in indirect costs (lost earnings) [Yelin et al. 2007]. This total is equal to 1.2 percent of the 2003 U.S. gross domestic product. Each year, arthritis results in 992,100 hospitalizations and 44 million outpatient visits. 8.2 million working aged U.S. adults (about 1 in 20) report work limitations due to arthritis or joint symptoms while Blacks and Hispanics with arthritis have almost twice the prevalence of work limitation and severe pain compared to Whites (Theis et al. 2007).

1.1.4 PURPOSE OF THE STUDY

The purpose of this study is to identify those positively screened for major depression within the older population (> 64 years of age) and identify whether or not the older population are more susceptible to major depression (MDD) if they acknowledge being diagnosed for arthritis (E) by a physician in the past twelve months or perceive themselves to have some form of arthritis(P). The dissertation will also suggest the unique sense of its contribution with regards to the identification of practitioner-based concerns and the particular variance from clinical diagnosis through differential diagnose (DSM-IV requirement) by substituting instead of complementing treatment decisions by utilizing assessment tools. The study will also identify the differences between those who report being told they have been diagnosed arthritis from a physician and those who perceive they suffer from the condition of arthritis. Additionally, the study will control

for factors which are correlated to or may influence the results while attempting to secure both validity and reliability within the study design.

1.1.5 SIGNIFICANCE OF THE STUDY

The proposed research makes the following contributions: First, the study follows a medical model approach by utilizing the exact criteria from the DSM-IV to identify those elderly persons who suffer from major depression. This is quite different from the subjective questioning of the patient given that the exact diagnostic criteria determine the patient's diagnosis and not the subjective response of the patient. Secondly, the sample size is large enough to be representative of the entire U.S. population. This provides a representative outcome-based study that can be generalized across the population of the nation for which the sample was drawn. The study will also provide clarity regarding a descriptive account and variance between an individual's perception (P) of feeling depressed and meeting the actual DSM-IV criteria for MDD. Finally, the NESARC dataset provided many control variables which nearly match the alternate risk factors for the interaction between major depression and arthritis. These variables will be controlled for in order to best represent the "true relationship" between major depression and arthritis.

CHAPTER TWO: LITERATURE REVIEW

2.1 CONTRIBUTIONS OF THE STUDY

This dissertation will attempt to examine the intended elements within the DSM-IV (APA 2000), as it relates to Major Depressive Disorder (MDD) and express concerns for the field given the current standardized assessments and their reliance with regarding to evaluation, treatment, and referral. Additionally, as technological advances in pharmacological dependency in treatment has increased, the impact regarding drug interactions, as well as specificity of psychotropic medications, has created a systemic concern for both patient safety as well as overall effective treatment within the mental health community. A focus on technological innovation and clinical management in mental health practice and policy would provide an improvement in overall treatment effects. This is dependent on both clinical adherence (appropriate diagnosis/treatment recommendations), as well as patient adherence (particularly in pharmacological interventions). Both should be measured and accounted for, while clinical interventions should utilize similar technologically managed care systems to prevent any future medical errors to include lack of treatment, under-treatment, mistreatment, and overtreatment in mental health clinical practice settings, as described by the American Psychiatric Association (APA).

Moreover, this dissertation selected a specific nationalized dataset (NESARC) including those >64 years of age to evaluate MDD (descriptively), as it relates to the perception (P) of being “depressed” (self-reported) and those who positively screen by

DSM-IV criteria (E) for MDD. This dissertation is attempting to establish the case through a nationalized sample that perhaps a perception of being “depressed” in primary care may be enough of an indicator to establish rationale to begin the evaluation, treatment and referral process review given that much relies on the “diagnostic” processes (differential diagnosis as suggested by the DSM-IV) and the need for “screening” and not reluctant tendencies to “assess” in primary care and ensure that the clinical standards and DSM-IV standards are being met and not the sub-categorical categorization of an assessment created from the DSM-IV standards itself.

The study will attempt to provide detailed results between the perception of being depressed (P) and positively screened MDD diagnosis of the DSM-IV. Additionally, those either perceived to be suffering from arthritis (P) or those self-reporting to have been diagnosed by a physician for arthritis (E) will be studied providing data regarding the comorbid conditions between MDD and arthritis and their correlation along with the need to establish collaboration in evaluation, treatment, and referral (particularly focus on the diagnosis and psychopharmacologic recommendations [between and within]) in order to ensure that the right care, at the right time, at the right cost (Triple Aim) is done; ensuring patient safety and quality.

In 2011, the American Psychiatric Association updated their “Practice Guidelines for Treating Major Depressive Disorder (MDD)” (APA 2011) for which much of the substantive support of the literary response and recommendations will be added within. However, the “gold standard” for treatment guidelines and the need for clinical training and competent decision-making (to include differential diagnosis) originates and follows the recommendations of the DSM-IV (APA 2000). It is important to note that the DSM-

V (APA 2013) was officially publishing in 2013; following a review of MDD and mood disorders, no significant changes impacting evidence-based decision making or differential diagnosis requirements were made concerning MDD or the categorization of mood disorders.

The study research question (Q1) and hypotheses (H1 – H3) can be found in Section 2.14.

2.2 THE EPIDEMIOLOGY OF MDD

Early on, depression was viewed as a deficiency involving neurotransmitters, particularly the “monoamines” serotonin, norepinephrine, and dopamine (Julien et al. 2011). There is also evidence of alterations of several neuropeptides, including corticotropin-releasing hormone (DSM-IV 2000). In some depressed individuals, hormonal disturbances have been observed, including elevated glucocorticoid secretion (e.g., elevated urinary free cortisol levels or dexamethasone nonsuppression of plasma cortisol) and blunted growth hormone, thyroid-stimulating hormone, and prolactin responses to various challenge tests (DSM-IV 2000). Attention has now shifted on intracellular processes, such as second messengers, and their function in the neuron. Two of these second messenger functions are (1) to protect neurons from damage due to injury or trauma and (2) to promote and maintain the health and stability of newly formed neurons (Julien et al. 2011). This new way of “second messenger” thinking is referred to as neurogenic theory of depression (Julien et al. 2011). Neurogenic theory believes (1) existing neurons are able to “repair” or “remodel” themselves and (2) the brain is capable of making new neurons. The hippocampus is where attention, concentration, and memory is formed and the repair or creation of new neurons adds to the field of

neuroscience theory (Julien et al. 2011). Stressful situations can reduce hippocampal function and damage existing neurons (Julien et al. 2011). Antidepressants are known to repair neurons and increase neuron creation (Julien et al. 2011). The second messenger system targets the cAMP response-element-binding protein (CREB) [Julien et al. 2011]. CREBs protein increases in the hippocampus during chronic antidepressant treatment further support the second messenger generation of new neurons (Julien et al. 2011). Depression beginning in late life is associated with alterations in brain structure, including periventricular vascular changes (DSM-IV 2000).

2.3 THE DSM-IV CRITERIA FOR MDD (IN CONTEXT)

The DSM-III (1983) was introduced to provide an evidence-based categorization of mental illness in which highly trained clinicians could have a standardized method of communicative collaboration and diagnostic criteria. The practical purpose for this development was to bridge mental health with physical health for which physicians utilized objective evidence (medical modeling) to diagnose the physical ailments of persons and the overall combined health (physical and mental) were becoming important as the development of treatment methods (pharmacology) could provide effective interventions for medical and psychological patients alike. The DSM-IV (2000) was then expanded upon to meet the growing body of evidence within mental health treatment along with the rapidly expanding technological interventions (pharmacology) available to those health practitioners for which whom would have more treatment choices and selections to make and determine (diagnose/treatment) including a collaborative approach to both physical and mental health treatment. With the latest version of the DSM series arriving this year (DSM V 2013), it would seem that there are relative concerns regarding

both the utilization of all practitioners and the DSM standards and practices, as it relates to the diagnosis (specificity) and its impact on treatment (pharmacology) with an ever-increasing focus pharmacologically on specificity and intensity of drug selection and its interactions with other physical and mental health medications selected for treatment.

Since the NESARC dataset utilized the DSM-IV, I will discuss the interpretive intentions of the DSM authors to best describe my dataset. It is important to note that the DSM-IV cautions the use of categorization for diagnosis, however, it does not caution against its use to utilize for research and educational purposes. The DSM-IV authors express their sincere acknowledgement that the manual is to be utilized by highly skilled clinicians in order to be understood as a diagnostic tool; this is given to its “ruling out” etiology based on phenomenological ordering and the need to fully understand its intention to review and fully consider the concept of differential diagnosis. Additionally, the DSM-IV requires the understanding of specificity in diagnostic decision-making, requiring the coding to extend past the differential diagnostic process into adding “subtypes” and “specifiers”. This is most important, as later pharmacological recommendations are not only made based on the diagnosis (most assessments test), however, it must be differentially diagnosed, sub-typed, and have inclusion of specifiers (where needed). The DSM-IV states, “subtypes define mutually exclusive and jointly exhaustive phenomenological subgroupings within a diagnosis” and “specifiers are not intended to be mutually exclusive or jointly exhaustive” (DSM-IV 2000). This fact will be important, as I fully explain the diagnostic intentions of the manual and utilize MDD and the “ruling out” process of differential diagnosis.

From a larger perspective, from beginning to end, the classification of a patient would be evaluated using a multiaxial assessment (Axis I – IV). The following are the categorical alignment of each axis a clinician is to review in order to conduct a full and proper assessment: (1) Axis I – Clinical Disorders (2) Axis II – Personality Disorders (3) Axis III – General Medical Conditions (4) Psychosocial and Environmental Problems (5) Global Assessment of Functioning [GAF]. The primary diagnosis typically reviewed is clinical and the Axis III-IV are usually viewed as co-occurring or secondary diagnoses. However, it is important, as in physiological conditions, to understand how each condition may interact along with the treatment modality considered or previously administered (therapeutic or drug interactions). It is also critical to understand that each one of these conditions and its diagnosis must be *clinically* reliable and valid in order to effectively administer and monitor pharmacological treatment. Traditional assessments suggest that if the assessment “measures what it is supposed to measure” it is “valid” and if it “consistently measures what it says it is going to measure” it is “reliable”. This is dependent that the instrumentation has accounted for the *clinical* elements, particularly when *specificity* is so critical for both diagnosis and treatment considerations (see Sections 2.4 and 2.5).

During this review of the DSM-IV, I am simply going to review the complexities of the category of “mood disorders” and the specific diagnosis of “MDD” (subcategory within “mood disorders”). This is appropriate given our study question and hypotheses, as well as a case review depicting the need for a “screening” tool (DSM-IV) in context instead of the clinically used assessments tools (see Section 2.4).

“Mood disorders” consist of the following sub-categorized “depressive disorders”: (1) Major Depressive Disorder (MDD); (a) Single episode (b) Recurrent; (2) Dysthymic Disorder (3) Depressive Disorder Not Otherwise Specified (NOS). “Mood disorders” also consist of subcategorized “bipolar disorders”: (1) Bipolar I Disorder; (a) single manic episode (b) most recent episode hypomanic (c) most recent episode manic (d) most recent episode mixed (e) most recent episode depressed (f) most recent episode unspecified; (2) Bipolar II Disorder (3) Cyclothymic Disorder (4) Bipolar NOS (5) Mood Disorder Due to General Medical Condition (6) Substance Induced Mood Disorder (7) Mood Disorder NOS. It is important to note the following three issues: (1) each of these sub-conditions could have a detailed listing of specifiers to review (2) particular medical conditions (neurological such as Parkinson’s Disease, Huntington’s Disease, Multiple Sclerosis, Stroke, and Alzheimer’s Disease) have been linked to these particular diagnoses [coded on Axis I and III] (3) differential diagnosis needs to take place to include a collaborative review of all medications prior to treating with pharmacological intervention(s).

Within the MDD diagnosis, all of the following diagnoses need to be “ruled out” prior to reviewing criteria for the diagnosis of MDD: (1) mood disorder due to general medical condition (2) substance-induced mood disorder (3) dementia (4) manic episodes with irritable mood or mixed episodes (5) attention-deficit/hyperactivity disorder [ADHD] (6) adjustment disorder with depressed mood (7) bereavement (8) depressive disorder NOS [for those who do not meet criteria for duration or severity]. Again, each suggested diagnosis needs to be expanded upon by sub-type and specifier in order to truly “rule out” all DSM differential priorities indicated. Additionally, given the elderly cross-

sectional sample within the study, “due to general medical condition”, “substance induced mood disorder” (to include prescribed medical interactions) and “bereavement” may be of particular interest for consideration. Next, five of nine categories would need to be “met” (see Table 3.1) to include the following conditions: (1) symptoms do not meet criteria for “mixed episode” (2) symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning [GAF] (3) symptoms are not due to direct physiological effects of a substance [drug of abuse or medication] or general medical condition [link to MDD] (4) symptoms are not better accounted for by bereavement [loss of a loved one, symptoms persisting longer than two months or characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation] (DSM-IV 2000).

The DSM-IV also identifies the need for most mood disorders to provide both episodic and course specifiers. This is particularly important to know when attempting to prescribe medications considering that an accurate diagnosis identifying both a cross-sectional identification of the particular issue and its severity as well as a longitudinal (cyclical) history of stated diagnosis is needed. The DSM-IV provides “decision trees” for clinical assistance for each category of disorders. These are added as appendixes near the end of the manual in order to assist clinicians in proper diagnostic decision-making (both clinical and family practice) and care planning.

2.4 QUALITY PROBLEMS IN COMMONLY USED ASSESSMENTS

A review of both the American Psychiatric Association (APA), “Practice Guidelines for Treating Major Depressive Disorder (MDD)” [2010] and the American

Academy of Family Physicians' (AAFP) subsection regarding "Depression and Bipolar" [2012] treatment and diagnostic recommendations leave much concern within regard to the absence of both highly skilled clinical diagnostic review (partnered psychiatrist) and the criteria-based assessment tools currently being accepted into practice. Many of these assessment tools have been adapted to meet the ever-growing prevalence in mental health concerns and the additive treatment modalities (pharmacology). Additionally, ever-increasing documentation requirements have reduced the amount of time physicians have with each patient, chronic care and treatment options (both physically, mentally, and a combination of both) have expanded the complexities of treatment, and the expansive relationship within drug interactions and their "specificity" lead to much concern for both patient safety and the streamlining of "standards of practice" to "realities of care". Specificity and drug toxicity are alarming; for which drug developers have reviewed the exact dosage, time release, toxicity, and specificity recommendations (which diagnosis and subtyping receive what drug) for which abbreviated assessments do not meet the recommendations of both the drug developer, the "standards of practice"; leaving concerns within the realities of care (lack of treatment, under-treatment, mistreatment, or over-treatment).

This study provides a differential diagnostic review of assessment tools (section on the DSM-IV) while questioning abbreviated assessment tools and their interaction with the rapid changes in psychopharmacology. Additionally, this study will attempt to show that the perception (P) of either depression, and more specifically, arthritis (P) or arthritis (E) evaluated with MDD, is an important difference from previous studies in that the focus will be on the "standards of practice" (recognition and screening in a timely

fashion for specificity in diagnosis) instead of the realities of care (focused on an abbreviated assessment that disregards differential diagnosis and the partnering of a highly skilled clinician to review [psychiatrist] or the recognition accountability to address the need for highly skilled training at all levels below or the need to refer for treatment).

The remainder of this section will address several of the current abbreviated assessment tools being utilized to identify MDD in clinical practice. It is important understand that the instruments (as written) cannot replace the highly skilled clinician, as they do not account for either physical health (comorbid concerns or drug interactions) or other mental health conditions (the “ruling out” process required in the DSM-IV). Moreover, the percentiles expressed regarding “sensitivity” and “specificity” do not represent the similar terminology described in the DSM-IV (specificity), as the assessment is being reviewed for “sensitivity” and “specificity” based on the particular questions within the assessment (limited) as they relate to MDD and not the depth of diagnosis. The measurements do not account for inter-relationships within comorbid treatment and drug selection, as well as drug “specificity” needed for appropriate treatment selection; this is based on the “specificity” of the diagnosis as well as the appropriate selection of the “sub-type” and the “specifier” from the DSM-IV.

The AAFP suggests the first instrument utilized in assessing a patient is the Patient Health Questionnaire - 2 (PHQ-2). Their report and findings suggest that it is as effective as the Beck Depression Inventory (BDI) and the Zung Depression Scale (ZDS). The reported rate of specificity on this particular assessment tool is 67 percent with a sensitivity rating of 97 percent. The PHQ-2 simply asks the following two questions

(related to the two criteria discrediting the diagnosis of MDD in the DSM-IV [must have either to have MDD]): (1) little interest (2) feeling down. There is some variance from direct context within the DSM-IV regarding these two questions as the DSM-IV suggests content specific to the following two categories: (1) depressed mood [sad/empty] and (2) loss of interest or pleasure.

The AAFP then recommends, if positive, to utilize the PHQ-9. If the patient's age is >64 years, then administer the Geriatric Depression Scale (GDS) [15 item scale] as well; this comes both recommended by the AAFP and the American Geriatric Association (AGA). The PHQ-9 is reported to have a rating of 94 percent sensitivity and 61 percent specificity. Following a review of 18 studies (AAFP 2012), the GDS [15 item scale] had a sensitivity rating between 74 and 100 while having a specificity rating between 53 and 98. The particular questions within the PHQ-9 had those similar to the criteria within the DSM-IV for MDD, however, they divided the responses into four sub-categories: (1) not at all (2) several days (3) more than half days (3) nearly every day. Additionally, the totals of the responses are added to create a final result attempting to "detail" the severity of MDD: (1) 1-4 [minimal], (2) 5-9 [mild], (3) 10-14 [moderate], (4) 15-19 [moderately severe], and (5) [severe]. The GDS [15 item scale] has 15 questions in which "yes/no" responses are given; the assessor understands which "yes/no" response suggests a positive assessment towards MDD in which > 5 positive responses are "suggestive of depression" and > 10 positive responses are "almost always depression". The AAFP then suggests that if either of these assessments are "positive" they should be confirmed utilizing the DSM-IV and its criteria. However, we are making the distinction that, given the environment of collaborative and quality care, meeting the "criteria" is not

the standard of the DSM-IV. The standard of the DSM-IV is met through differential diagnosis “above and beyond” the standard and the standard requires “sub-typing” and “specifiers” for accurate diagnosis. However, it is important to understand that both the assessment options and the AAFP recognize the DSM-IV as the final authority in diagnostic care.

The APA focuses primarily on the four assessments: (1) PHQ-9, (2) Beck’s Depression Inventory [BDI], the Hamilton Rating Scale for Depression [HAMD], and the GDS. Given the AAFP recognized both the PHQ-9 and the GDS, we will not duplicate a descriptor or the elements needed to understand both sensitivity/specificity and the scoring of these assessments. The BDI is a 21 item assessment, quite detailed [scaling 0-3], with an overall scoring system as follows: (1) 1-10 [ups/downs considered normal], 11-16 [mild mood disturbances], 17-20 [borderline clinical depression], 21-30 [moderate depression], 31-40 [severe depression], and over 40 [extreme depression]. The BDI was the most comprehensive assessment reviewed, however, it did not account for “differential diagnosis” within the instrument nor “rule out” the requirement to utilize the DSM-IV for this purpose following a positive assessment. The HAMD is a 21 item assessment tool that includes similar scales as the BDI. Conversely, the HAMD includes some stratification to account for things such as personality disorder, somatic conditions, and anxiety. However, it is important to note that none of the additional generalized itemization is enough or conclusive to include diagnosis in these areas. The scales included vary from smaller scales, such as 0-2 responses generally around secondary diagnoses (such as personality disorders, somatic conditions, and anxiety) to more details responses, such as 0-4, representing those characteristics surrounding MDD.

The most compatible assessment (highly detailed) for clinicians and relative to the comorbid complexities to include the review of DSM-IV criteria (including differential diagnosis) is the Composite International Diagnostic Interview (CIDI 3.0) developed by Dr. Ronald Kessler as supported by the World Health Organization (WHO). This sectional reporting tool was developed for researchers in order to administer DSM-IV appropriately reviewed diagnosis criteria to provide an actual account of validity in a large researched population sample (later reviewed within the European Study of the Epidemiology of Mental Disorders [ESEMED 2007]). Although comprehensive in nature, it was primarily constructed from research conditions or administered by highly trained interviewers in sections. Additionally, the administration of sectional assessments are time consuming making it difficult to clinically administer in a primary care setting or one in which practitioners are assessing patients within a limited window of time.

2.5 QUALITY IN PSYCHOPHARMACOLOGY AND THE DIAGNOSIS

The purpose of this section of the dissertation is to identify the solutions, challenges, and side effects of psychotropic and antidepressant drugs used in the treatment of MDD. The brief review of psychopharmacology (science of how drugs affect the body) [Julien et al. 2011] is needed in order to fully understand that particular drugs and their effects in “intensity”, “release”, and “specificity” are relative to those overall positive and negative effects in treatment.

“Pharmacokinetics” is the understanding of the basic principles of drug absorption, distribution, metabolism, and excretion (Julien et al. 2011).

“Pharmacodynamics” examines the interactions between drugs and receptors to which the drug attach as well as how the attachment results in alterations in cell function and

behavior (Julien et al. 2011). Pharmacokinetics is made up of the four basic processes: (1) absorption (2) distribution (3) metabolism (4) elimination (ADME) [Julien et al. 2011]. Concepts related to the four basic processes are: drug tolerance, drug dependence, dosage, intensity and half-life. These terms have much to do with “time” and the impact (effect) of the drug on the cellular processes and the body’s response to such interventions. Drug absorption refers to processes and mechanisms by which drugs pass from the external world into the bloodstream (Julien et al. 2011). Drug distribution is the passing across various barriers in the bloodstream to reach its site of action (receptors) [Julien et al. 2011]. The processes involved between the kidney and liver within drug metabolism and elimination are complex; the important element is to understand that they both are involved in metabolism and elimination and their rates of absorption and excretion have an impact on overall drug effect.

Tricyclic antidepressants (TCAs) block the presynaptic transporter; commonly referred to in its impact on chemical structures, as newer antidepressants are defined by their mechanism of action (Julien et al. 2011). Some side effects of TCAs are as follows: confusion, memory and cognitive impairment, dry mouth, blurred vision, increased heart rate, dizziness and urinary retention (Julien et al. 2011). Monoamine oxidase inhibitors (MAOIs) bind to and block the enzyme monoamine oxidase; this enzyme metabolizes and regulates the amount of the biogenic amine transmitters in the presynaptic nerve terminal (Julien et al. 2011). TCAs and MAOIs are referred to as first-generation antidepressants. In the late 1980s, selective serotonin reuptake inhibitors (SSRIs) were developed, the first being fluoxetine (Prozac) [Julien et al. 2011]. Newer drugs have only altered side effects and improvements are still needed in the following ways: (1) superior

efficacy (2) faster onset of action (3) improved side effect profile (Julien et al. 2011). It is most important to understand that antidepressant medications have a variety of side effects that combined with other medications can be significant or dangerous.

Additionally, the Federal Drug Administration (FDA) has approved specific drugs for specific purposes and clinicians should be fully aware of their impact on patients along with recommended dosages. The following drugs are approved by the FDA for the treatment of MDD: (1) SSRIs (a) fluoxetine [20-60mg/day] (b) sertraline [50-200 mg/day] (c) paroxetine [20-60 mg/day] (d) citalopram [20-60 mg/day] (e) escitalopram [10-20 mg/day] (2) SSNRI (a) duloxetine [60-120 day] (b) venlafaxine [75-375 mg/day] (c) mirtazepine [15-45 mg/day] (d) desvenlafaxine [50 mg/day] (3) NDRI (a) bupropion [300-450 mg/day]. The “mg/day” were recommendations made from the APA practice guidelines; combined with the FDA approved antidepressant listing. The practice guidelines from the APA (2010) also provides a detailed listing of side effects and the numerous antidepressants associated with that particular side effect and treatment of each specific side effect. Lastly, elderly patients are particularly prone to orthostatic hypotension and cholinergic blockade; for this reason, SSRIs, SNRIs, and other antidepressants should be considered over MAOIs or TCAs (APA 2010); chronic conditions in the elderly typically include the need to closely manage comorbid and treatment conditions involving both physical and psychological drug interactions.

2.6 QUALITY STANDARDS IN EVALUATION, TREATMENT AND REFERRAL

This dissertation attempts to make a clear distinction between the current practices of mental health diagnoses and those described as a “standard of care” within the DSM-IV and the practice guidelines (2010) outlined by the APA. Within each

assessment previously evaluated, each instrument identified that the DSM-IV standards were the overall “standard of care” prescribed by the APA and others alike and act as if the overall consensus on evaluations for treatment and referral. Within the health care system, a referral is commonly known as “needed” if the health provider or practitioner is uncertain as to what form of treatment is needed to protect both the patient from harm (malfeasance) and for the provider to not administer something that is not clinically known to add benefit to the patient (beneficence).

Both the AAFP (2012) and the APA (2010) guidelines suggest the clinician administer some form of an accepted assessment in order to validate the diagnosis. This dissertation questions the validity of such assessments and their instrumentation towards diagnosis and its impact on the patient if psychopharmacology and prescriptive services are needed. Kessler also expressed concerns later justified with the CIDI results (2007) within the ESEMeD sample population (Section 2.7). The following are the treatment recommendations by the APA (psychiatrist management) with regards to MDD: (1) establish and maintain a therapeutic alliance [assuming this would include a clinically competent referral network based on the DSM-IV and differential diagnosis requirements] (2) complete the psychiatric assessment [important that differential diagnosis and cognition of comorbid and drug interaction effects] (3) establish the appropriate setting for treatment (5) evaluate functional impairment and quality of life (6) coordinate the patient’s care with other clinicians (7) monitor the patient’s psychiatric status (8) integrate measurements into psychiatric management [review of side effects and therapeutic benefits] (9) enhance treatment adherence [suggestion to monitor clinical adherence to the DSM-IV standards and differential diagnosis] (10) provide education to

the patient and the family [suggest clinical education as well]. Below are the treatment recommendations by the APA (acute phase) with regards to MDD: (1) chose an initial treatment modality (a) pharmacotherapy (b) other somatic therapies (electroconvulsive therapy) [ECT] (c) psychotherapy (d) psychotherapy plus antidepressant medication (2) assessing the adequacy of treatment response (3) strategies to address nonresponse. The final treatment phases of recommendation for evaluation and monitoring are the continuation phase, maintenance phase, discontinuation of treatment. The APA recommendations also outline details regarding the clinical factors influencing treatment as follows: (1) psychiatric factors [types of psychotropic medication and dosage], (2) demographic and psychosocial factors [Andersen/House blended framework], and (3) co-occurring general medical conditions (APA 2010).

2.7 PRIMARY CARE PHYSICIANS' ROLE IN MDD

The details regarding the holistic treatment (physical/mental) is a complex one for each of the providers, practitioners, and clinician selected to work together towards the overall health of a patient. Moreover, the task of managing those with chronic and comorbid conditions/multiple modalities of treatment is even more challenging for all involved. The primary care physician (PCP) is often the gatekeeper to their patient's care and often is found to be the care provider even in complex circumstances of treatment those with mental illnesses. During the CIDI review of the ESEMeD (2007), only the following proportions of those surveyed (N=514) were receiving adequate treatment by severity of MDD: (1) mild [12 percent], (2) Moderate [16 percent], (3) Severe [26 percent], (4) Very Severe [39 percent] (5) Total [22 percent] (Kessler 2007). Within the Psychological Problems in General Health Care (PPGHC) [primary care], 17 percent had

depression; within the ESEMeD population sampled, 13.4 percent had major depression in primary care (Tylee et al. 2007). The PPGHC recognized that 49 percent of those identified being recognized by the assessment tool criteria as having MDD were not recognized by their primary care provider (PCP) [Tylee et al. 2007]. The ESEMed identified that 15 percent with mood disorders and 23 percent with anxiety disorders (within previous 12 months of a visit to their PCP) did not receive either psychotropic medications or psychological treatment (Tylee et al. 2007). Either collaborative care or further extensive training has worked to improve both appropriate diagnosis and recognition of mental health conditions in the primary care setting (Tylee et al. 2007). In two studies, the National de la Sante et de la Recherche Medicale (INSERM] (26,422 PCPs), and the ESEMed review, only 54 percent and 58 percent respectively, of those meeting the criteria of MDD were considered “psychiatric cases” and only 15 percent and 26 percent respectively received a diagnosis of MDD (Lucrubier 2007). It is important to note that 63 percent of patients with mood disorders and 79 percent of patients with anxiety disorders did not seek help over the previous 12 months from their PCP (ESEMed) [Nutt et al. 2007].

2.8 THEORETICAL FRAMEWORK

2.8.1 FOUNDATIONAL ELEMENTS OF THE FRAMEWORK

A review of several reports/documents was conducted in determining the best overall theoretical framework considering the integration of behavioral and mental health services with the current physiological standards of care. The purpose of this section of the dissertation is to outline the reports/documents reviewed chronologically while establishing a precedent for integrative care. Integrative care will be defined as the

collaborative care standard consisting of the combination of the following types of care and the most optimal referral of such care as determined by both the primary care physician and the patient: behavioral, mental, spiritual, and physiological.

The first portion of this review will come from a health services policy creation vantage point, reviewing both the policies of interest concerning integrative care and those most related to the NESARC dataset utilized in the dissertation research. The purpose of this section is to demonstrate that the U.S. makes a major shift in policy implications regarding integrative health policy and its' intended national practices towards combining mental health as a standard treatment, evaluation, and practice of care in the primary setting. It will also demonstrate its prevalence in prevention services as well as a “national call” towards equity in treatment and payment methods which impact accessibility of treatment.

Policy evolution regarding mental health care:

In 1996, the “Mental Health Parity Act” (MHPA) was established, intending to create equality and accessibility (parity) towards treatment for those with mental health issues (Department of Labor, Fact Sheet on MHPA 1996). The law also established that financial concerns (insurance) would treat reimbursement for such mental health services in an equivalent manner to that of physical health. In 1999, the U.S. Surgeon General established a report entitled, “Mental Health, A Report of the Surgeon General”, which outlines the national level concerns of mental health in the U.S. and its impact to both the population as well as its financial impacts and trends towards overall financial burden to the population. The collaborative care model (CCM) was then outlined as a national standard of care (2002). Additionally, in 2002, the Substance Abuse and Mental Health

Services Administration (SAMHSA) published a report to identifying the comorbid correlation between substance abuse disorders and mental health disorders.

In 2003, the President of the U.S. established a Commission on Mental Health which published a report called, “Achieving the Promise: Transforming Mental Health Care in America”. This report outlined specific administrative goals which it hoped to achieve while outlining particular steps towards achieving such mental health goals. The President’s report outlined the need for “better coordination between mental health and primary health care”, calling for the “treatment for co-occurring disorder to be integrated” and to “expand screening and collaborative care in primary care settings”. The report also recognized the finding from the World Health Organization (WHO) which identified mental illnesses as the leading causes of disability worldwide.

In 2008, the “Mental Health Parity and Addiction Equity Act” (MHPAEA) was passed to limit insurance companies from establishing excessive deductibles, copays, and coinsurance in order to exclude mental health services in practice and ensure elements of coverage were covered, more specifically, to include addiction services (Department of Labor, Fact Sheet on MHPAEA 2008). In 2011, the “National Prevention Strategy” for public health and health services was authored by the U.S. Surgeon General outlining a specified framework inclusive of integrative care and strategies to improve overall health care services (HHS, National Prevention Strategy 2011). Lastly, in 2012, a “Report to Congress” regarding the “Compliance with MHPAEA” was conducted to assure policymakers that adherence was being given to the law and its added elements from the MHPA (1996).

Although policy concerns were addressed, practical applications to the implementation of collaborative and integrative care were also being established. In 1967, the American Academy of Pediatrics (AAP) established the first “medical home” model featured around children and those children with “special needs”, later adding elements to the “medical home” concept to include all medical services (2002). In 2007, the “Joint Principles” of the patient-centered medical home (PCMH) were established by a joint venture lead by AAP, the American College of Physicians (ACP), the American Osteopathic Association (AOA) and the American Academy of Family Physicians (AAFP) [AAP 2007]. They would include the following principles related to the overall care of patients and their health care needs: (1) personal physician (2) physician directed medical practice (3) whole person orientation (4) coordinated/integrated (5) quality/safety. Integrative care will be the primary focus regarding the establishment of a synthesized conceptual framework between all levels of care.

In 2008, a study including the concept of the “Triple Aim”, made up of the following goals [(1) better care, (2) better health (3) reduced costs] identified that 30% or \$700 billion of health services were “unnecessary” and further categorized these services as “wasteful” (Berwick, D. M., Thomas, T. W., & Whittington, T. 2008). Berwick’s outline of the “Triple Aim” added another perspective that “better care” would include both collaborative and integrative health services in order to “reduce costs” while adding the elements of “better care” for the population being served. The “Triple Aim” then synthesized its findings with the PCMH model further stimulating the call for “Accountable Care Organizations” (ACOs) to produce organizations that (1) increase quality through per capita primary care cost monitoring over a continuum of care (2)

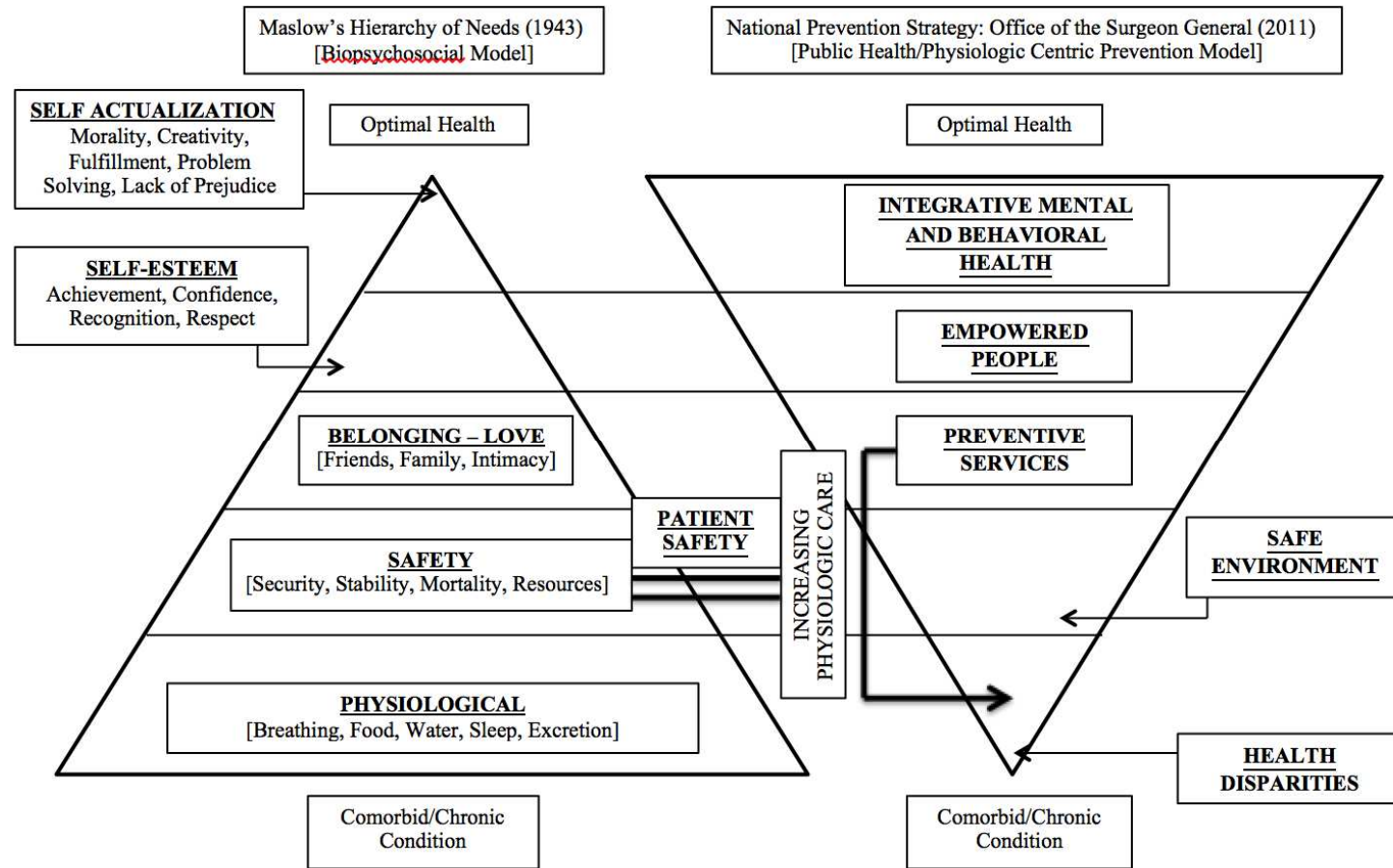
payments linked to quality improvement (3) more sophisticated performance measurement (McClellan M., et al. 2010). ACOs were formally established in 2006 and took national precedence in 2010, as it became a part of the national health care law, the Patient Protection and Affordable Care Act (ACA).

Theories relevant to mental health and mental health care:

The following is the primary review regarding the theorized conceptual framework and its originations. In 1943, Abraham Maslow developed “Maslow’s Hierarchy of Needs” and published his explanation of human motivation within five categorical areas: (1) physiological [food, water, shelter, and warmth], (2) safety [security, stability, freedom from fear], (3) belonging – love [friends, family, spouse, lover], (4) self-esteem [achievement, mastery, recognition, respect], and (5) self-actualization [pursue inner talent, creativity, fulfillment] (Maslow 1943). This was a sentinel article within the areas of behavioral and psychological behavior, adding initial framework depth to the development of human motivation and choices concerning integrative health. In 2011, the Surgeon General’s office published a report called the “National Prevention Strategy” (NPS), outlining key strategies going forward in addressing the public health concerns. Collectively, the identified areas within the NPS were categorized into the following groups (Figure 2.1): (1) health disparities (2) safe environment (3) preventive services (4) empowered people (5) integrative mental and behavioral health. Figure 2.1 (next page) depicts an inverse inter-relationship between Maslow’s “Hierarchy of Needs” (1943) and its impact concerning the elements within the NPS (2011). The purpose of Figure 2.1 is to demonstrate a “connection” between previously established psychological and behavioral models (Maslow 1943) and current

prevention strategies and/or the national prevention strategies of the nation (NPS 2011). Within the model, “optimal health” is associated with “self-actualization” (Maslow 1943) and “integrative mental and behavioral health” (NPS 2011). “Co-morbid and chronic conditions” are associated with “physiological” elements [such as breathing, food, water, excretion] (Maslow 1943) and with “health disparities” in the NPS. The model suggests an improved level of physiological care could exist between “preventive services” and “health disparities” (NPS 2011) while the established of physiological care between the two categories suggests an increase in quality and “patient safety” (Figure 2.1).

Figure 2.1 Maslow's Hierarchy of Needs (1943) Comparison Surgeon General's National Prevention Strategy (2011)



Note: "Patient Safety" becomes the link between Maslow's Hierarchy of Needs (1943) and Surgeon General's National Prevention Strategy (2011) when Integrative Health Frameworks are evaluated and compare

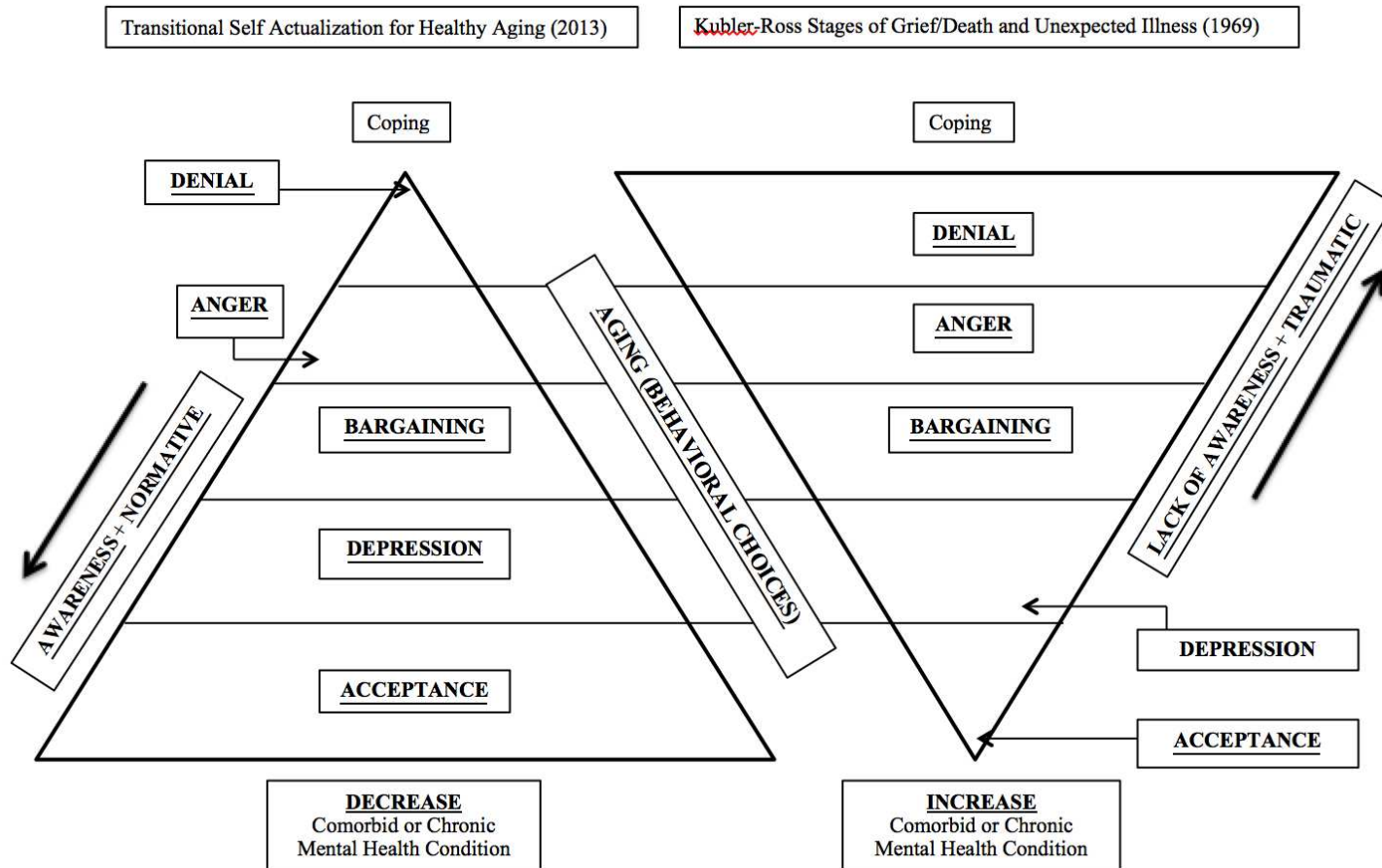
In 1969, Elisabeth Kubler-Ross developed another psychological and behavioral pivotal theory called, “The Five Stages of Death/Grief”. The rationale for the evaluation of this theory, like Maslow’s, “Hierarchy of Needs”, is two-fold: (1) established as a sentinel finding in the field of psychology and behavioral theory (2) indicates an established leveling of “health” comparative to psychological elements such as “coping”. Additionally, unlike Maslow’s “Hierarchy of Needs”, Kubler-Ross addresses elements of “death/grief” which are more centralized to the aging population. A review of both the best practices in death/grieving “coping” and the overall improved (optimal) health status of the aging population would seem relevant, as one attempts to frame the correlations between mental/behavioral health and physiological elements of health in what national policy seems to demand in collaborative and integrative health. These findings were previously discussed and demonstrated to be valid with the review in policy to include, but is not limited to, the following: CCM, Triple Aim PCMH, and ACOs.

Kubler-Ross identifies “The Five Stages of Grief” from beginning to end as such: (1) Denial (2) Anger (3) Bargaining (4) Depression (5) Acceptance [Figure 2.2]. The process begins with the concept of “coping” through a period of time in “denial” of the event itself. Experience regarding the frequency of death and loss and the preparation for the event (trauma) seem to be most likely experientially impacted by the age of the person involved. The more time it takes to navigate through the “five stages” the more likely the person impacted will experience an increase in comorbid or chronic elements of mental health. Inclusively, as one “travels” through the five periods, experience by experience, the “build up” of one event, toppled upon another, would also increase the likelihood of comorbid chronic mental health resulting from multi-level experiences of

both unexpected/expectant death through multiple unresolved grief-based events.

Likewise, the reciprocal version of “The Five Stages of Grief” can be experienced by the recently created, “Transitional Self Actualization of Healthy Aging” (2013), in which the impact of health on the aging population can be viewed quite differently regarding their “transitional” ability to “cope” with death and loss. First, seniors are more used to experiencing death and loss of their friends and close family members, so as their experiences “normalize” (more aware) [Figure 2.2, next page], the quicker they adapt to the initial stages (given their shortened comparative period of mortality) of “The Five Stages of Grief”, the most optimal health they can have for the finite time period of life remaining. Additionally, the expeditious movement through the five stages would seem to product a decrease in comorbid or chronic mental health conditions. As one ages, it would appear that the reciprocal elements of the five stages would be dependent on “awareness” and “normative” responses to the aging processes and the decisions being made through the processes of aging.

Figure 2.2 Kubler-Ross Stages of Grief/Death and Unexpected Illness / Transitional Self Actualization for Healthy Aging



2.8.2 FRAMING THE FRAMEWORK (ANDERSEN AND HOUSE)

Abraham Maslow (1943) and Elisabeth Kubler-Ross (1969) framed the psychological and behavioral rationale behind a need for the collaborative and integrative (blended) framework in primary care and preventive health delivery, even if that was not their initial intentions when developing their theories. Figure 2.1 demonstrated the need for integrative mental and behavioral health in modern day medical treatment, given the inverse relationship between Maslow and NPS while Figure 2.2 demonstrated another inverse mental and behavioral health relationship as it related to the aging process, in Kubler-Ross and the “Transitional Self Actualization in Healthy Aging” model. The term “Self Actualization” was attributed to the model established by Abraham Maslow and his final stage of human motivation.

Ronald Andersen (1995) and James House (1981, 2001) were the two theoretical frameworks selected to “blend” both a “health services” model (Andersen 1995) [Figure 2.3] and a social/behavioral model (House 1981 & 2001) [Figures 2.4 & Figures 2.5]. Andersen’s model focused on four categorical areas in his identification of health services utilization: (1) Environment (2) Population Characteristics (3) Health Behavior (4) Outcomes (Andersen, 1995). Under the “environment” category, two subcategories emerged: (1) health care system (2) external environment. The “population characteristics” consisted of the following three subcategories: (1) predisposing characteristics (2) enabling resources (3) need. The “health behavior” category was made up of the following two subcategories: (1) personal health practices (2) use of health services. Lastly, the “outcomes” category consisted of the following three subcategories: (1) perceived health

status (2) evaluated health status (3) consumer satisfaction (Andersen, 1995) [Figure 2.3].

House's, "Paradigm of Stress Research" (1981)

Figure 2.3 Andersen's Health Services Conceptual Framework Model (1995)

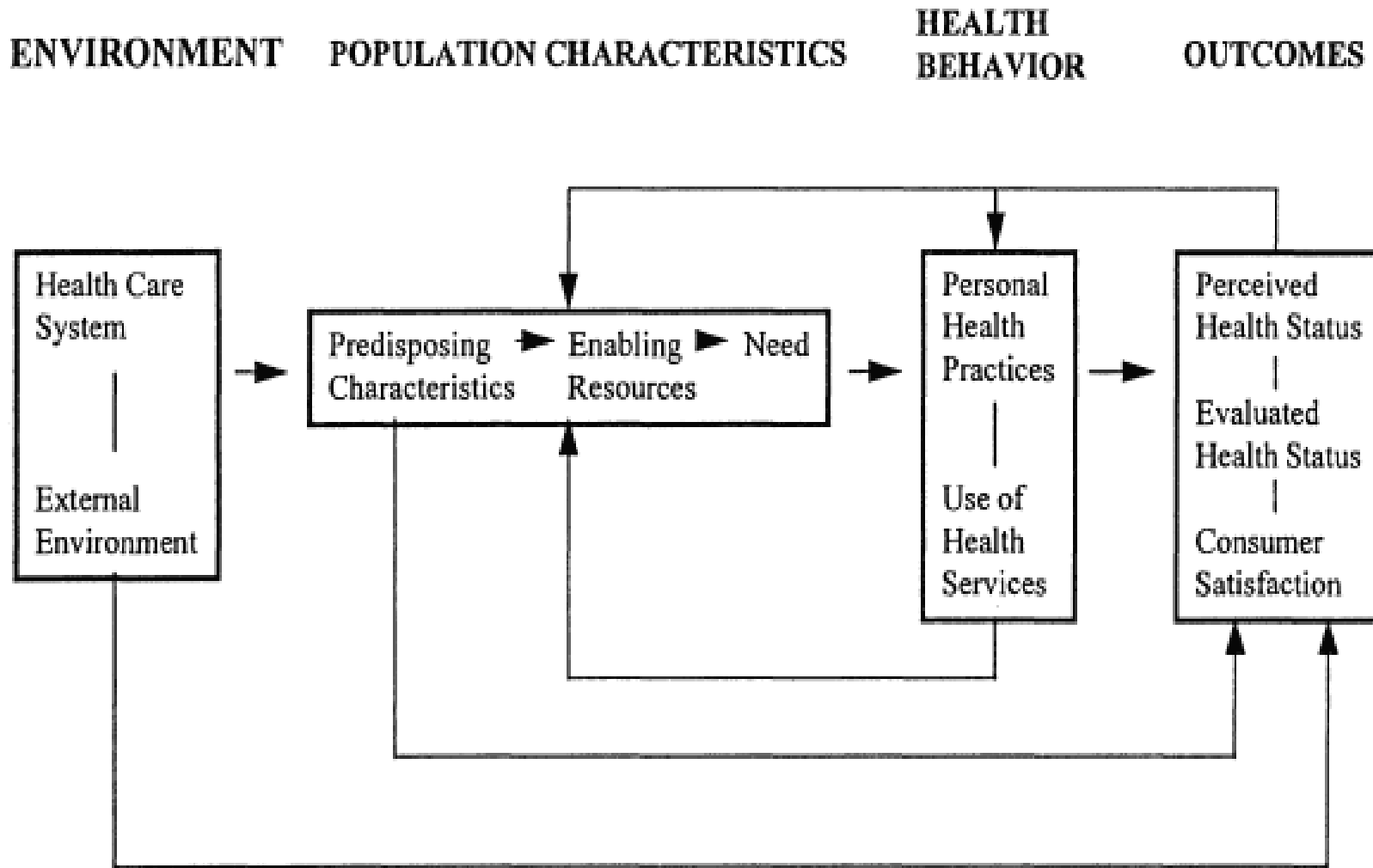
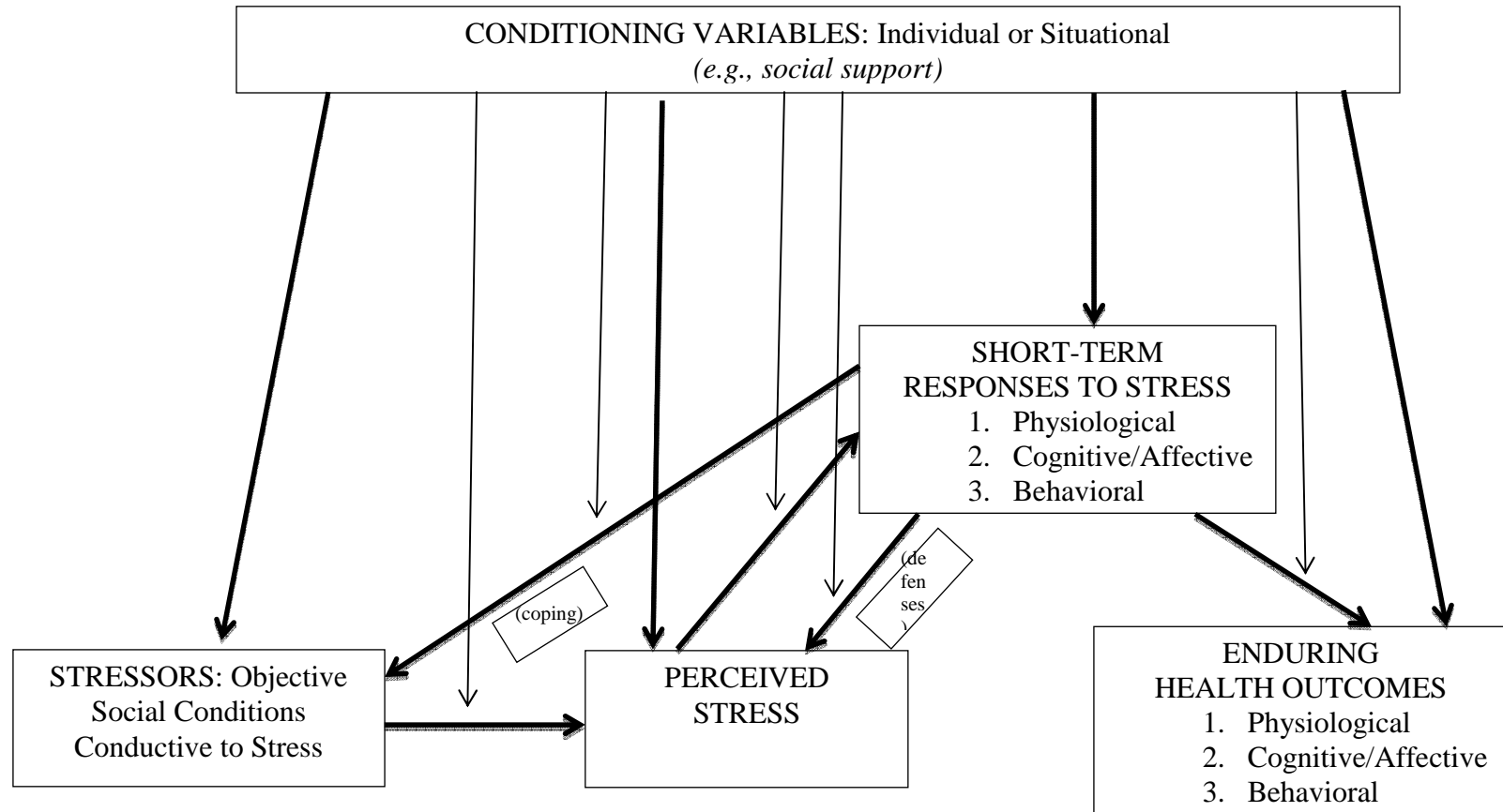
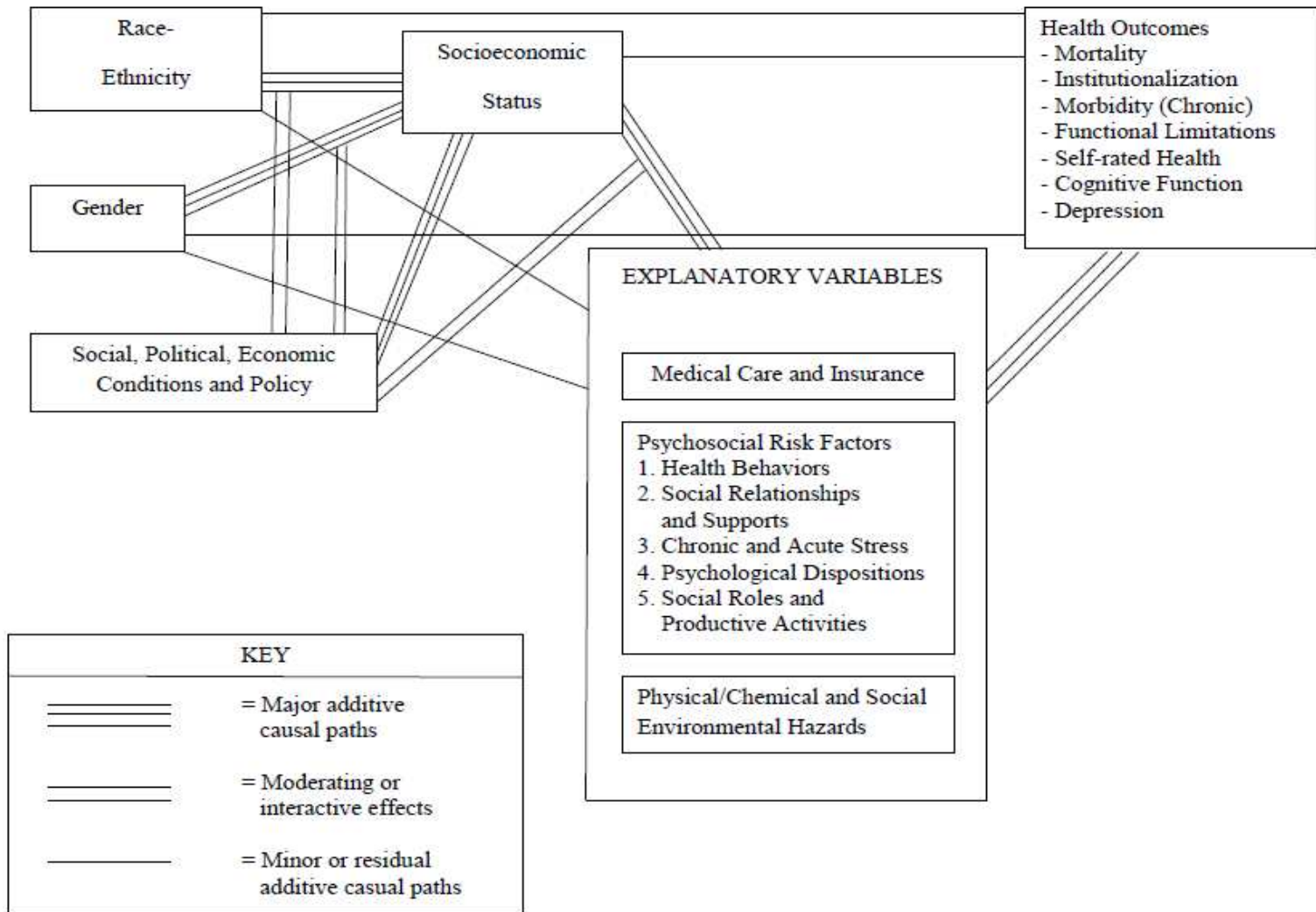


Figure 2.4 House's Conceptual Framework: Paradigm of Stress Research (1981)



Note: Solid arrows between boxes indicate presumed casual relationships among variables. Lighter arrows from the box labeled “conditioning variables” intersect solid arrows, indicating an interaction between the conditioning variables in the box at the beginning of the solid arrow in predicting variables in the box at the head of the solid arrow as published in House (1981:36).

Figure 2.5 House's Conceptual Framework for Understanding Social Inequities in Health and Aging (2001)



[Figure 2.4] may focus on “stress”, however, the blended framework with utilize his thorough flowchart review of both individual and situational conditioning variables and their relationship to overall “health” versus “stress”. Our research would suggest a correlational assumption that overall “stress” accounts for a similar relational response to the overall “health” of an individual. The key conceptual components considered within House’s model (1981) to create our blended framework are the following: (1) conditioning variables, both individual and situational, have an impact on objective social conditions impacting overall health (2) both perceived and objective (evaluated) events both positive and negative impact short-term level responses to health (3) coping and defense mechanisms relative to both objective and perceived events have an impact on both short-term response mechanisms and long-term health outcomes (4) short-term responses and long-term elements consider of the following subcategorical elements of health: physiological, cognitive/affective, and behavioral (House, 1981) [Figure 2.4]. Additionally, House’s (2001) [Figure 2.5] further contribution to the blended framework comes within the following three areas of original contribution: (1) the identification of specific explanatory variables accounting for psychosocial risk factors such as: health behaviors, social relationships/support, chronic/acute stress, psychological dispositions and social roles/productive activities (2) an increased focus of definitive subcategories of health outcome to include the following: mortality, institutionalization, morbidity (chronic), functional limitations, self-rated health, cognitive function, and depression (3) the inclusion of physical/chemical and social environmental hazards (House 2001).

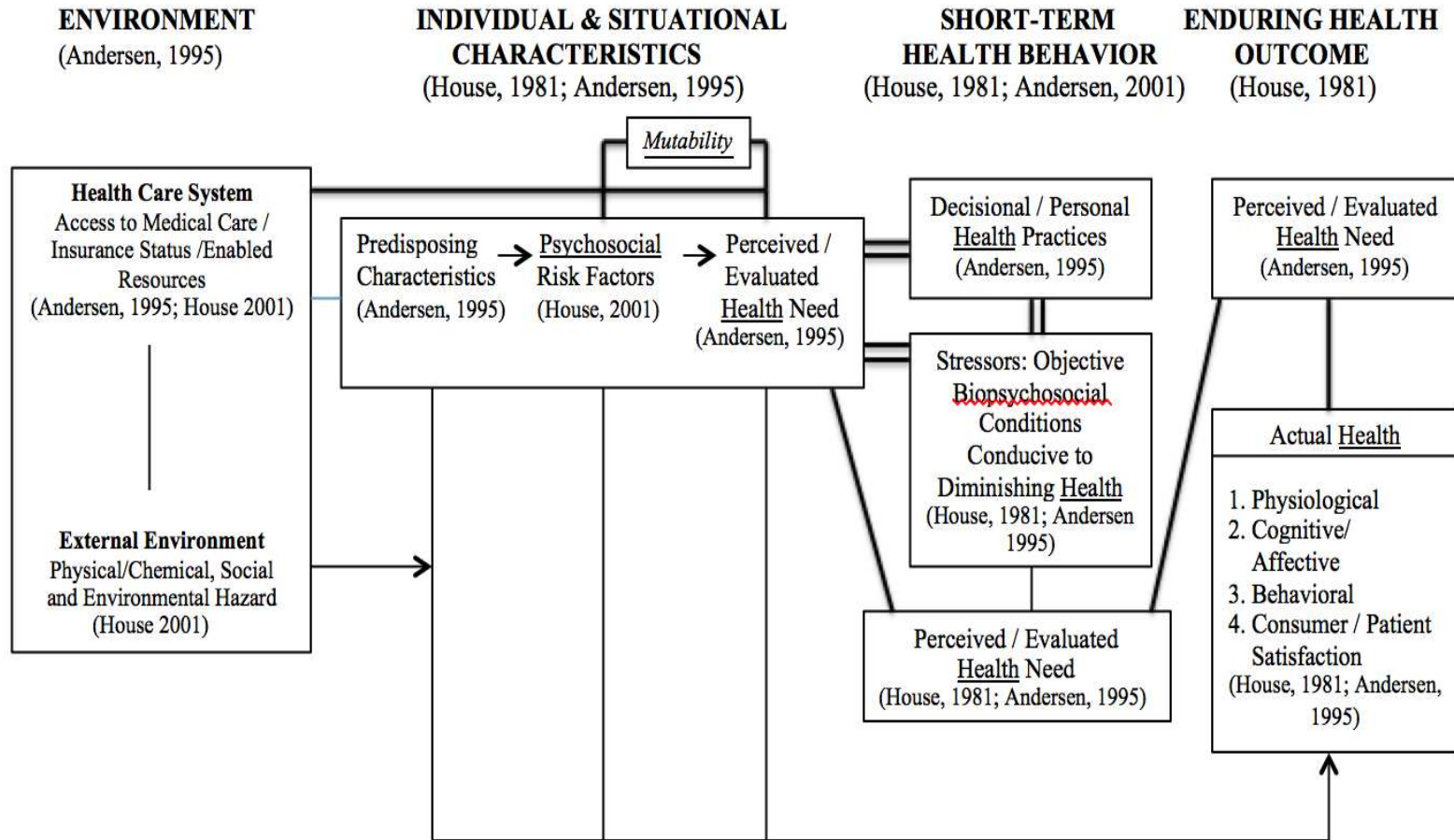
2.8.3 FINAL BLENDED FRAMEWORK (ANDERSEN AND HOUSE)

The final blended framework [Figure 2.6, next page] centers on the Andersen's (1995) formation of categorization (environment, population characteristics, health behavior, and outcomes), however, expands them into a more comprehensive and integrative heading consisting of the following: (environment, individual/situational characteristics [House 1981], short-term health behaviors [House 1981 & Andersen 1995], enduring health outcome [House 1981 & Andersen 1995]. The category labeled "environment" maintained Andersen's original two categories (health care system and external environment), however, the following subcategories were added: (1) under health care system (a) access to medical care (b) insurance status (c) enabled resources (2) under external environment (a) physical/chemical, social and environmental hazard (House 2001). "Enabled resources" were originally sectioned as a subcategory under Andersen's category of "population characteristics" (Figure 2.3), however, given its importance to the blended model, "enabled resources" was placed as a subcategory of consideration earlier in the blended model under the category of the "health care system" (Andersen 1995). In "enabled resources" previous place, "psychosocial risk factors" were considered to be the psychological and behavioral element most needed, as it was referenced as important by House in 2001. The elements under "psychosocial risk factors" (health behaviors, social relationships/support, chronic/acute stress, psychological dispositions, and social roles/productive activities) add needed depth to the model attempting to create a most collaborative and integrative model of health to include health services research and psychological and behavioral health (House 2001). Andersen's model then has a subcategory of "need" under "population characteristics".

This appeared to be quite broad so the blended model depicted “need” as “perceived/evaluated health need”, focusing on physiological need, since “psychosocial risk factors” would address the psychological, behavioral, and mental health conditions and status (Figure 2.6).

Andersen’s previously listed category, “health behavior”, was utilized, however, given the collaborative and integrated intention of the blended framework, adjusted to “short-term health behavior” (Figure 2.6). Andersen’s subcategory of “personal health practices” was comprehensively altered to “decisional / personal health practices”, ensuring the inclusion of decision-making and choice reflecting back to address both the perception of needed health services. The next subcategory was entitled, “stressors: objective biopsychosocial conditions conducive to diminishing health” given its account for the elements associated with the “biopsychosocial” areas of health (House 1981). Figure 2.6 depicts the present and short-term health inner-relationships between three areas: (1) perceived/evaluated health need (2) decisional/personal health practices (3) stressors: objective biopsychosocial conditions conducive to diminishing health. This circular relationship would indicate that the “need” is more than the utilization of health services but the preventative understanding (awareness) of multi-faceted conditions (social, physiological psychological, biological, behavioral, mental, etc...) and a timely response to addressing the collective of those needs (Figure 2.6). Much of this is due to the perceived and evaluated health from multiple sources characterized by the categorical heading of “individual and situational characteristics”. It is vitally important for both the individual and the health professional to comprehend, understand, and address these multi-faceted health concerns in a comprehensively, communicated, collaborative, and

Figure 2.6 Andersen (1995) / House's (1981, 2001) Blended Conceptual Framework Model



integrated way to prevent short-term and long-term negative health outcomes and/or comorbid/chronic health conditions.

“Perceived / Evaluated Health Need” is a subcategory of both the “short-term health behavior” category as well as the final category, the “enduring health outcome” category developed through an influence by House (1981). The continuation of “perceived /evaluated health need” demonstrates the short-term to long-term anticipated decline in health outcome if the “need” is not perceived by the individual and evaluated by the collective of health professionals. The final category under “enduring health outcome” is “actual health” with multiple sub-components taken from both House (1981) and Andersen (1995): (1) physiological (2) cognitive/affective (3) behavioral (4) consumer/patient satisfaction [Figure 2.6].

Most importantly, health is outlined as the integration of elements 1-4 and a pathway is drawn best describing prevention and wellness around the awareness of “actual health”. When categories of “environment” and “individual and situational characteristics” are collectively understood, the individual can reduce the elements impacting their “actual health”. The model seems to also demonstrate the timely dependence on self and health professionals to identify the “perceived/evaluated need”. As Andersen projects in his health services research model, the discovery of “perceived/evaluated need” can explain the gaps between access, quality, and value in health services utilization while House’s contributions can preventatively demonstrate the “need” for social, psychological, and behavioral impacts to include physiological utilization of health services and link “awareness” to both the individuals seeking care and the professionals delivering such care (Figure 2.6).

Arthritis (independent variable of interest) is more physiological and seems more appropriately represented by a medical model approach. Regarding arthritis, Andersen's (1995) Health Services Model was selected for review, given its collective account for the following categories: health care system, external environment, population characteristics, health behavior, and outcomes focus. However, with concerns to overall "outcome", it would seem that of the three subcategories, (perceived health status, evaluated health status, and consumer satisfaction) there were psychological elements within an integrated methodology that is needed to fully account for overall health outcome in the model.

House's (1981 & 2001) models account for the psychological elements (psychosocial risk factors) and appeared more comprehensive. MDD (dependent variable) is a psychological disorder for which an appropriate model must be considered. The blending of both a physiological, health services model (Andersen 1995) and a psychological/behavioral model for which House demonstrated creates a blended framework which both match current health policy initiatives and collaborative/integrative health care initiatives. Additionally, the blended framework and model will add value in explaining the inter-relationship between those with depression and the arthritic condition.

2.9 CHARACTERISTICS OF THE POPULATION AGED 65 AND OLDER

This portion of the dissertation will focus on an overall demographic description of the older population (to include spending), as well as describing key identified descriptive variables to include the following: "age", "gender" and "health status".

Focus on "spending" and its relationship to the blended framework:

It is important to focus on several Medicare cross-sectional analyses of “cost”, given the selected blended framework (Andersen/House) and the inclusion of “mutability” (Andersen, 1995). Previously, the health policy trends were outlined to describe concepts such as “the Triple Aim” (population health, per capita costs, and the experience of care), “PCMH” and “ACOs”. Additionally, the push for collaborative and integrative care models (including behavioral health) impacts the overall medical home model, as providers seek to increase services while decreasing costs associated with untreated, mistreated, or non-treatment. This is particularly true with the chronic care model and conditions which are most prevalent in this particular population. As the “Triple Aim” suggests, population health must account for “quality” (right treatment, at the right cost, at the right time) in order to optimize the “health outcome” while minimizing the overall societal impact (scarcity and limited amount of health resources). Andersen’s model regarding utilization and health services suggest that “cost” be considered first (preventative) under the “health care system” in which “access” provides a level of preventative care suggesting that proactive accounts for “cost” become not only imperative in current health policy affairs but vital and could even account for many “patient safety” issues (Figure 2.1). If a descriptive account of “cost” by “condition” or other primary subset (gender, age, etc...) can provide both preventative (mutable) strategies for intervention and/or new and improved methods of assessment (early detection) and treatment, now is the time for “cost containment” measures to implemented in an effort to redirect health resources while optimizing health outcomes.

Grouping the older population (most costly group/per capita) and cross-sectionalizing them by categories is a necessary element for discovery aligned with

intervention strategies towards health improvement. Within the blended framework, the focus on both the “perceived” and “evaluated” health of someone more likely to be suffering from “depression” (psychological condition) while having “arthritis” (physiological condition) both suggests the importance of the integrated care model (prevent chronic/costly conditions) while demonstrating that “perceived” health is potentially a “call” for required “assessment tools” for those displaying particular psychological and physical responses/characteristics in the primary healthcare setting.

Medicare Demographics and Spending:

The following information was derived from the CMS National Health Expenditure (NHE) report (2011). The elderly population consisted of more than 42 million persons over the age of 65. The per capita spending per enrollee (2011) was \$10,900 for which the national budget for Medicare was \$554 billion. \$231 billion were consumed by hospitals (in-patient services), \$124 billion were utilized for physician/clinical services, and nearly \$64 billion were spent on prescription drugs. Additionally, the overall budget for Medicaid during this period was \$407 billion given that over 5 million seniors are dual eligible (utilize both Medicare/Medicaid) [CMS, National Health Expenditures 2011].

Age: (Subcategories of 65-74, 75-84, and 85+):

According to the US Census (2010), there are over 40 million persons in the US aged 65 and over. Of those, over 21 million persons were between the ages of 65-74 (youngest old), 13 million were between the ages of 75-84 (middle old), and 5.5 million were of an age greater than 85 years (US Census 2011). Between the periods of 2000 – 2010, the US population grew by 27 million persons, those 65 and older grew by 5.2

million during that period (US Census 2011). During this same period, those categorized as the youngest old grew by 3.3 million person, those middle old persons grew by 700,000 persons, and the oldest old grew by 1.2 million persons (US Census 2011).

Gender/Age: (Subcategories of 65-74, 75-84, and 85+):

The total population of males in the US over 65 years in 2010 was 17.3 million persons, a 3 million person increase over that in 2000 (US Census 2011). Of those, 10 million were 65-74 (1.8 million increase), 5.5 million were 75-84 (600,000 person increase), and 1.8 million were over 85 years of age; a 550,000 person increase from 2000 (US Census 2011).

The total population of females over 65 years of age in 2010 was 22.9 million, a 2.3 million person increase over 2000 (US Census 2011). Those women in the age group of 65-74 (in 2010) was 11.6 million (increase of 1.5 million persons), the number of women between 75-84 was 7.6 million (100,000 increase), and 85+ women numbered 3.7 million (700,000 increase) [US Census 2011).

Health Status (Respondent Reported) by Age [65-74, 75-84, and 85+]:

The following statistical information regarding health status and age categorization was provided by the CDC's "Health Data Interactive" with sourcing information retrieved from the longitudinal collection (1997-2011) of the National Health Interview Survey (NHIS).

Of those older persons 65-74, nearly 42 percent reported having "excellent/very good" health, 34 percent had "good" health, however, nearly 21 percent of those 65-74 report "fair/poor" health. Seniors in the age group of 75-85 have the following self-reported health status: 38 percent have an "excellent/very good" health status, 35 percent

report having “good” health, while 27 percent disclose having “fair/poor” health. Lastly, those persons 85+ self-report the following: 30 percent have “excellent/very good” health, 36 percent report having “good” health, while 34 percent disclose having “fair/poor” health.

2.10 CHRONIC CONDITIONS OF THE US POPULATION AGED 65 AND OLDER

Nationally:

Elderly beneficiaries, 65-74, are most likely to experience the following chronic conditions: 52 percent will have hypertension, 47 percent will also have hyperlipidemia, 27 percent will have diabetes, 26 percent will have heart disease, 27 percent will have diabetes, 25 percent will have RA, 11 percent will have depression and 5 percent will have OA (CMS Chronic Conditions Dashboard 2011). Additionally, those seniors, 75-84, will experience the following prevalence rates a chronic effects: 66 percent will have hypertension, 53 percent will have hyperlipidemia, 38 percent will have heart disease, 34 percent will suffer from RA, 30 percent will have diabetes, 12 percent will have depression, and 9 percent will have OA (CMS Chronic Conditions Dashboard 2011). Lastly, for those 85+, the following prevalence rates and chronic medical issues will occur: 70 percent will have hypertension, 43 percent will have heart disease, 42 percent will have hyperlipidemia, 39 percent will have RA, 16 percent will depression, and 13 percent will have OA (CMS Chronic Conditions Dashboard 2011).

By Age, Gender, and Type (All/Dual/Non-Dual):

Per the remainder of the dissertation, “dual” will be defined as having both Medicare and Medicaid insurance while Non-Dual is in reference to those only having Medicare as their primary form of insurance. This will be categorized by the following:

dual, non-dual, and “all” (a combination of dual/non-dual). The population of elderly Americans is about 43 million, with approximately 9 million (25 percent) being dual eligible and 36 remaining solely provided for under Medicare (US Census 2010).

Elderly female beneficiaries (all), 65-74, are most likely to experience the following chronic conditions: 57 percent will have hypertension, 45 percent will also have hyperlipidemia, 26 percent will have diabetes, 29 percent will have heart disease, 26 percent will have diabetes, 29 percent will have RA, 15 percent will have depression, 15 percent chronic kidney disease and 7 percent will have OA (CMS Chronic Conditions Dashboard 2011). Comparatively, elderly male beneficiaries (all), 65-74, are most likely to experience the following chronic conditions: 51 percent will have hypertension, 46 percent will also have hyperlipidemia, 29 percent will have diabetes, 32 percent will have heart disease, 26 percent will have diabetes, 20 percent will have RA, 7 percent will have depression, 12 percent chronic kidney disease and 1 percent will have OA (CMS Chronic Conditions Dashboard 2011). This same group of female beneficiaries (dual) are most likely to experience these heightened rates of chronic disease prevalence: 70 percent will have hypertension, 52 percent will also have hyperlipidemia, 45 percent will have diabetes, 34 percent will have heart disease, 26 percent will have diabetes, 40 percent will have RA, 25 percent will have depression, 19 percent chronic kidney disease and 11 percent will have OA (CMS Chronic Conditions Dashboard 2011). This same group of male beneficiaries (dual) are most likely to experience these heightened rates of chronic disease prevalence: 63 percent will have hypertension, 45 percent will also have hyperlipidemia, 45 percent will have diabetes, 40 percent will have heart disease, 26 percent will have diabetes, 26 percent will have RA, 16 percent will have depression, 22

percent chronic kidney disease and 2 percent will have OA (CMS Chronic Conditions Dashboard 2011). Within this same group of younger old (65-74) women (non-dual), they are most likely to experience the following chronic conditions: 51 percent will have hypertension, 47 percent will also have hyperlipidemia, 22 percent will have diabetes, 18 percent will have heart disease, 26 percent will have diabetes, 28 percent will have RA, 12 percent will have depression, 8 percent chronic kidney disease and 8 percent will have OA (CMS Chronic Conditions Dashboard 2011). Within the same group of younger old (65-74) male (non-dual), they are most likely to experience the following chronic conditions: 49 percent will have hypertension, 46 percent will also have hyperlipidemia, 27 percent will have diabetes, 31 percent will have heart disease, 26 percent will have diabetes, 19 percent will have RA, 6 percent will have depression, 11 percent chronic kidney disease and 1 percent will have OA (CMS Chronic Conditions Dashboard 2011).

The middle oldest group (all) of females (74-85) are most likely to experience the following chronic conditions: 68 percent will have hypertension, 53 percent will also have hyperlipidemia, 26 percent will have diabetes, 32 percent will have heart disease, 29 percent will have diabetes, 39 percent will have RA, 15 percent will have depression, 16 percent chronic kidney disease and 14 percent will have OA (CMS Chronic Conditions Dashboard 2011). The middle oldest group (all) of males (74-85) are most likely to experience the following chronic conditions: 62 percent will have hypertension, 53 percent will also have hyperlipidemia, 33 percent will have diabetes, 46 percent will have heart disease, 29 percent will have diabetes, 27 percent will have RA, 9 percent will have depression, 21 percent chronic kidney disease and 2 percent will have OA (CMS Chronic Conditions Dashboard 2011). The “dual” group of middle-oldest women presented with

the following chronic conditions: are most likely to experience the following chronic conditions: 78 percent will have hypertension, 52 percent will also have hyperlipidemia, 45 percent will have diabetes, 43 percent will have heart disease, 26 percent will have diabetes, 46 percent will have RA, 24 percent will have depression, 25 percent chronic kidney disease and 15 percent will have OA (CMS Chronic Conditions Dashboard 2011).

The “dual” group of middle-oldest men presented with the following chronic conditions: 70 percent will have hypertension, 47 percent will also have hyperlipidemia, 45 percent will have diabetes, 49 percent will have heart disease, 43 percent will have diabetes, 32 percent will have RA, 18 percent will have depression, 30 percent chronic kidney disease and 4 percent will have OA (CMS Chronic Conditions Dashboard 2011).

The “non-dual” group of 75-84 women, presented with the following conditions: are most likely to experience the following chronic conditions: 66 percent will have hypertension, 53 percent will also have hyperlipidemia, 26 percent will have diabetes, 29 percent will have heart disease, 25 percent will have diabetes, 37 percent will have RA, 13 percent will have depression, 14 percent chronic kidney disease and 13 percent will have OA (CMS Chronic Conditions Dashboard 2011).

The “non-dual” group of 75-84 men, presented with the following conditions: 61 percent will have hypertension, 53 percent will also have hyperlipidemia, 26 percent will have diabetes, 46 percent will have heart disease, 31 percent will have diabetes, 27 percent will have RA, 7 percent will have depression, 20 percent chronic kidney disease and 2 percent will have OA (CMS Chronic Conditions Dashboard 2011).

The oldest age women (85+) [all] had these chronic conditions: 73 percent will have hypertension, 41 percent will also have hyperlipidemia, 26 percent will have

diabetes, 39 percent will have heart disease, 25 percent will have diabetes, 43 percent will have RA, 18 percent will have depression, 23 percent chronic kidney disease and 17 percent will have OA (CMS Chronic Conditions Dashboard 2011). The oldest age men (85+) [all] had these chronic conditions: 66 percent will have hypertension, 45 percent will also have hyperlipidemia, 29 percent will have diabetes, 53 percent will have heart disease, 25 percent will have diabetes, 31 percent will have RA, 12 percent will have depression, 31 percent chronic kidney disease and 4 percent will have OA (CMS Chronic Conditions Dashboard 2011). Those 85+ women who were considered dual also had these listed conditions: 77 percent will have hypertension, 37 percent will also have hyperlipidemia, 35 percent will have diabetes, 46 percent will have heart disease, 26 percent will have diabetes, 49 percent will have RA, 28 percent will have depression, 29 percent chronic kidney disease and 18 percent will have OA (CMS Chronic Conditions Dashboard 2011). Those 85+ men who were considered dual also had these listed conditions: 73 percent will have hypertension, 39 percent will also have hyperlipidemia, 35 percent will have diabetes, 55 percent will have heart disease, 38 percent will have diabetes, 38 percent will have RA, 23 percent will have depression, 39 percent chronic kidney disease and 5 percent will have OA (CMS Chronic Conditions Dashboard 2011). Lastly, those women 85+ considered non-dual also had these diagnosed medical conditions: 71 percent will have hypertension, 43 percent will also have hyperlipidemia, 22 percent will have diabetes, 36 percent will have heart disease, 26 percent will have diabetes, 41 percent will have RA, 15 percent will have depression, 21 percent chronic kidney disease and 17 percent will have OA (CMS Chronic Conditions Dashboard 2011). Lastly, those men 85+ considered non-dual also had these diagnosed medical conditions:

65 percent will have hypertension, 46 percent will also have hyperlipidemia, 27 percent will have diabetes, 29 percent will have heart disease, 26 percent will have diabetes, 31 percent will have RA, 10 percent will have depression, 29 percent chronic kidney disease and 3 percent will have OA (CMS Chronic Conditions Dashboard 2011).

2.11 COSTS ASSOCIATED WITH THE OLDER POPULATION

Nationally, total members by age 65+ dual enrollment (Medicare/Medicaid) and non-dual (Medicare only) were accounted for in a cross-sectional analysis (CMS, Chronic Conditions Dashboard 2011). One limitation of the analysis is that it did not include an account for “all” members (by age group) to compare between “dual” and “non-dual” members. Those dual members who had 0-1 chronic conditions cost \$3,023/annually versus non-dual enrollees annual fee of \$1,871. Dual members having 2-3 chronic conditions utilized \$7,687/annually while non-dual members used \$5,202 of the CMS budget. Dual members having 4-5 chronic issues utilized \$14,337/annually while non-dual members used \$10,817/annually. Lastly, dual members with 6+ chronic conditions utilized \$36,047/annually and non-dual members used \$29,312/annually.

Those older persons 65-74, having 0-1 chronic issue, the dual member utilized \$1,944/annually while the non-dual used \$1,621. Of this group, they represent 33 percent of its members and 7 percent of overall spending with the group. Those older persons 65-74 with 2-3 chronic issues, the dual member utilizes \$5,847/annually while the non-dual represents \$4,712 of annual CMS spending per capita. Of this group, they represent 31 percent of its members while spending 19 percent of their overall budgetary costs. Those older persons 65-74 with 4-5 chronic conditions, the dual member utilizes \$12,629/annually while the non-dual represents \$10,131/annually. Of this group, they

represent 22 percent of its members while spending 27 percent of its overall annual budget. Lastly, of those members 65-74 with 6+ chronic conditions, the dual members spend \$37,236/annually and the non-dual spends \$29,176/annually. Of this group, the 6+ chronic conditions members represent 14 percent of the total group, however, consume 47 percent of all sub-group spending (CMS, Chronic Conditions Dashboard 2011).

Of those older persons 75-84 (0-1 chronic issue), the dual member utilized \$2,084/annually, while the non-dual used \$2,103. Of this group, they represent 23 percent of its members and 5 percent of overall spending with the group. Those older persons 75-84 with 2-3 chronic issues, the dual member utilizes \$5,881/annually while the non-dual represents \$5,084 of annual CMS spending per capita. Of this group, they represent 33 percent of its members while spending 16 percent of their overall budgetary costs. Those older persons 75-84 with 4-5 chronic conditions, the dual member utilizes \$12,036/annually while the non-dual represents \$10,378/annually. Of this group, they represent 26 percent of its members while spending 27 percent of its overall annual budget. Lastly, of those members 75-84 with 6+ chronic conditions, the dual members spend \$33,911/annually and the non-dual spends \$28,650/annually. Of this group, the 6+ chronic conditions members represent 18 percent of the total group, however, consume 52 percent of all sub-group spending (CMS Chronic Conditions Dashboard 2011).

Those older persons 85+ having 0-1 chronic issue, the dual member utilized \$3,573/annually while the non-dual used \$2,712/annually. Of this group, they represent 17 percent of its members and 4 percent of overall spending with the group. Those older

persons 85+ with 2-3 chronic issues, the dual member utilizes \$7,471/annually while the non-dual represents \$6,101 of annual CMS spending per capita. Of this group, they represent 29 percent of its members while spending 14 percent of their overall budgetary costs. Those older persons 85+ with 4-5 chronic conditions, the dual member utilizes \$13,119/annually while the non-dual represents \$11,993/annually. Of this group, they represent 28 percent of its members while spending 26 percent of its overall annual budget. Lastly, of those members 85+ with 6+ chronic conditions, the dual members spend \$30,547/annually and the non-dual spends \$29,293/annually. Of this group, the 6+ chronic conditions members represent 26 percent of the total group, however, consume 57 percent of all sub-group spending (CMS Chronic Conditions Dashboard 2011).

2.12 INTRODUCTION TO DEPRESSION

Depression is an *affective disorder*, characterized by alterations in emotion or mood. The diagnosis of “major depressive episode” (MDD) is based on the following criteria, of which five must be evident daily or almost every day for at least two weeks (American Psychiatric Association 1994): depressed or irritable mood, decreased interest in pleasurable activities and in the ability to experience pleasure, significant weight gain or loss (>5 percent change in a month), insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive guilt, diminished ability to think or concentrate, and recurrent thoughts of death or suicide (Julien et al. 2011) [Table 3.1].

Of those ages 65+, nearly 5 million persons are reported to have depression (CMS, Chronic Conditions Warehouse 2010). Depression affects 6 percent to 10 percent of older adults in primary care settings and 20 percent to 40 percent of those with chronic

medical conditions (Donahue et al. 2011). In 2000, 9.2 percent of the older population was receiving some form of treatment for depression; comparatively, 14.3 percent are receiving treatment in 2010 (CMS). According to the CMS, 15 percent of all persons over the age of 65 have depression (Chronic Conditions Dashboard 2011). Of those, 18 percent are female and 11 percent are male.

2.12.1 PREVALENCE RATES

Depression is the most common affective or mood disorder of old age. About 15 percent Americans who are 65 years or greater suffer from increased depression, and, of those, 3 percent to 26 percent are elderly people residing in the community (Cloninger 2002). The prevalence level of depression is higher among the hospitalized elderly of 65 years and over at about 23 percent, and ranges from 16 percent to 30 percent among nursing home residents. Depression among the elderly can follow a major precipitant event or loss and is often related to chronic illness or pain (Boslaugh 2010).

Of those 65-74, 11 percent have depression, 6 percent only have depression, 27 percent have 1-2 conditions, 32 percent have 3-4 conditions, and 34 percent have 5+ conditions. Of those 75-84, 12 percent have depression, 2 percent only have depression, 17 percent have 1-2 conditions, 30 percent have 3-4 conditions, and 51 percent have 5+ conditions. Lastly, those 85+, 16 percent have depression, 1 percent only have depression, 13 percent have 1-2 conditions, 29 percent have 3-4 conditions, and 58 percent have 5+ conditions. 14 percent of women 65-74 suffered from depression, 15 percent of women 75-84 also had depression, and 18 percent of women 85+ were diagnosed with depression. 7 percent of men ages 65-74 had depression, 9 percent of men 75-84 suffered from depression, and 12 percent of men ages 85+ had depression (CMS, Chronic Conditions

Dashboard 2011).

2.12.2 COSTS OF DEPRESSION

According to a recent study regarding depression in the elderly population, 11.5 percent of this population has depression (Schneider et al. 2009). Of the conditions measured within the study, the prevalence rate reported was less than only diabetes (24.3 percent) and heart failure (17.7 percent) [Schneider 2009]. Regarding all mental health conditions, the US spent \$73 billion of which \$19.6 billion dollars was spending within Medicare (AHRQ, Medical Expenditure Survey 2010). Additionally, \$24.1 billion were for out-patient services, 15.1 billion were spent on in-patient services and \$45.3 billion on prescriptive medications (AHRQ, Medical Expenditure Survey 2010). The total expenditures for depression by Medicare (2005) were slightly more than \$3.2 billion dollars and spent nearly \$17,000 per year (2005) on those diagnosed seeking treatment for depression (Schneider 2009). An overall budgetary concern for depression must be given the population (42 million older persons) [US Census 2010] and the prevalence of elderly depression (11.5 percent or 4.8 million) and the overall current annual cost reported by Medicare for per capita treatment (\$10,900 per enrollee) [CMS, National Health Expenditures 2011]; the real projection of cost for depression treatment (point prevalence) is \$50 billion. This realized projection of depression under-treatment to actual treatment need is 15 times less than of the actualized budgetary commitment of \$3.2 billion. Of the conditions measured within the previous study, the overall per capita cost for depression treatment was only less than that for chronic kidney disease (\$26,671), chronic obstructive pulmonary disease [COPD] (\$21,409) and heart failure (\$20,525) [Schneider 2009].

2.13 INTRODUCTION TO ARTHRITIS

AORC is the most common cause of disability in the US (CDC; MMWR 2007). Arthritis affects 50 million Americans (Murphy et al. 2009) and approximately one in five adults in the US reported doctor-diagnosed arthritis between the periods of 2007-2009 (Flegal et al. 2010); 22% of adults in the US population have arthritis (Cheng et al. 2009). By 2030, an estimated 67 million Americans ages 18 years or older are projected to have doctor-diagnosed arthritis (Hootman & Helmick 2006). Of those ages 65+, nearly 10 million persons are reported to have RA and 2.3 million to have OA (CMS, Chronic Conditions Warehouse 2010). In 2030, >50% of arthritis cases will be among adults older than age 65 years. However, working-age adults (45–64 years) will account for almost one-third of cases (Hootman & Helmick 2006) Additionally, 25.9% of women and 18.3% men report doctor-diagnosed arthritis (Hootman & Helmick 2006).

2.13.1 TYPES OF ARTHRITIS

Osteoarthritis (OA), also known as degenerative arthritis or the wear and tear arthritis is a chronic disease that affects the synovial joints. It affects the joint capsule containing bone, cartilage and joint fluid. It is a wide spread type of arthritis and Conservative estimates indicate that in 2005, over 26.9 million adults in the US suffered osteoarthritis (Lawrence, Felson, & Helmick 2008).

Osteoarthritis targets the smooth cartilage that covers the end of bones to facilitate significant movement seen in the joint and hip. One is said to be suffering from OA when this smooth cartilage starts to break down. The disease causes the cartilage to wear off quicker than the body can repair it leading to bones rubbing on each other hence swelling and pain and the hyaluronic acid found in the joint is decreased.

Signs and symptoms of osteoarthritis manifest themselves with time. Joint pain can be experienced after an activity but goes away with rest; in advancing cases one can experience pain during rest. This form of arthritis can appear in two forms idiopathic and secondary forms. Idiopathic osteoarthritis is more prevalent in elderly people and seems to appear with age and not from a definitive cause. Secondary osteoarthritis is more prevalent in young adults and can be as a result of trauma to the joint.

There are no definitive ways to prevent osteoarthritis but physicians have given guidelines to help reduce the progression of the disease through weight loss, aerobic exercises, using therapy, glucosamine and increased vitamin B5 intake. This form of arthritis mostly affects the hips, spine and knees. According to Meisser (2005), weight loss is a must for patients suffering from osteoarthritis as it reduces loads on affected joints especially in obese and overweight elderly people.

Rheumatoid arthritis (RA) is an autoimmune chronic disease that is characterized by inflammation of joints and sometimes other body tissues. Autoimmune infections are as a result of the body's immune system failing to recognize a body tissue. It then attacks it as foreign. In rheumatoid arthritis, the body's immune system targets the synovial membrane which releases synovial fluid that lubricates the joints. This attack causes the membrane to inflame, thicken and erode leading to joint deformities. Although the synovial membrane is the primary target, other surrounding tissues or organs can be affected by rheumatoid arthritis.

Rheumatoid arthritis is more common in women than men and affects about 1% of the population. Scientist cannot definitively pin point the cause of autoimmune conditions like rheumatoid arthritis. Symptoms of rheumatoid arthritis can appear with

time but are usually prevalent between the ages of 20-60 years. The severity depends on individuals and the earlier the onset of the disease the more harsh and severe it will be. Research studies have shown that patients with rheumatoid arthritis are highly prone to depression.

Confusion can arise as to what form of arthritis one suffers from with the many symptoms like pain present in both rheumatoid and osteoarthritis. One of the main differences is that osteoarthritis is the wear and tear form of arthritis and tends to affect the knees and hips; these are large joints bearing a lot of weight. On the other hand rheumatoid arthritis tends to affect smaller joints like wrists, feet and hands.

Another difference is the duration of pain symptoms. In osteoarthritis pain more brief lasting a few minutes and sometimes goes away with rest. In rheumatoid arthritis, pain and stiffness is more intense and aggravates with rest like in the morning and may last for more than half an hour. Age is a factor concerning both forms of arthritis when identifying the duration of pain and its relative intensity.

2.13.2 PREVALENCE OF RHEUMATOID ARTHRITIS (RA)

Arthritis is the most common cause of disability in the US (CDC, MMWR 2007). According to the CMS, 29 percent of all seniors (65+) have AORC (CMS, Chronic Conditions Dashboard 2011) and specific diagnosis of RA impacts more than 1.3 million adults (Druss et al. 2000). Of those within the Chronic Conditions Dashboard (2011), 35 percent are female and 22 percent are male. Furthermore, 23 percent are <65, 25 percent are between 65-74, 34 percent are between 75-84, and 39 percent are 85+. Of those 65-74, 25 percent have RA, 10 percent only have RA, 35 percent have 1-2 conditions, 33 percent have 3-4 conditions, and 22 percent have 5+ conditions (CMS, Chronic

Conditions Dashboard 2011). Of those 75-84, 34 percent have RA, 6 percent only have RA, 27 percent have 1-2 conditions, 35 percent have 3-4 conditions, and 32 percent have 5+ conditions (CMS, Chronic Conditions Dashboard 2011). Lastly, those 85+, 39 percent have RA, 3 percent only have RA, 22 percent have 1-2 conditions, 33 percent have 3-4 conditions, and 42 percent have 5+ conditions (CMS, Chronic Conditions Dashboard 2011). 30 percent of women 65-74 suffered from RA, 39 percent of women 75-84 also had RA, and 43 percent of women 85+ were diagnosed with RA (CMS, Chronic Conditions Dashboard 2011). 20 percent of men ages 65-74 had RA, 27 percent of men 75-84 suffered from RA, and 31 percent of men ages 85+ had RA (CMS, Chronic Conditions Dashboard 2011).

2.13.3 COSTS OF ARTHRITIS

In 2006, the United States (U.S.) government spent approximately \$128 billion (\$80.8 billion in direct costs/\$47.3 billion in indirect costs) in expenditures related to AORC (Yelin et al. 2007). For OA and other non-traumatic joint disorders, the US spent \$62 billion of which \$27.4 billion were spent on services rendered to those 65+ in years (AHRQ, Medical Expenditure Survey 2010). Additionally, \$40.3 billion were for out-patient services, 31.4 billion were spent on in-patient services and \$17.4 billion on prescriptive medications (AHRQ, Medical Expenditure Survey 2010).

2.13.4 PREVALENCE OF CO-OCCURRING ARTHRITIS AND MDD

Arthritis is strongly associated with major depression (attributable risk of 18.1%), probably through its role in creating functional limitation (Dunlop et al. 2004). Depression and RA prevalence research results range from 13 percent to 20 percent (Morris et al. 2011). Within a similar study (n=1,793), of those having RA, 18 percent

had depression; additionally, 83 percent of those with depression also had anxiety (Murphy et al. 2012). Anxiety was more common in those with RA, as it presented in 31 percent of those with RA (Murphy et al. 2012). Only half of the respondents with RA and depression or anxiety sought help for their condition over the past year (Murphy et al. 2012).

Among adults with arthritis, depression or anxiety, 14.7 percent (5.5 million) reported both. Most respondents with depression also had anxiety (84 percent), whereas half of those with anxiety also had depression (49.5 percent) [Murphy et al. 2012]. 48 percent of those persons with RA reporting having “a lot” of difficulties dressing or bathing themselves were most likely to be suffering from depression (Murphy et al. 2012). Those persons with “low” confidence in managing their arthritis or joint symptoms were 3.9 times more likely to suffer from depression than those who had “high” confidence in managing their arthritis or joint symptoms (Murphy et al. 2012). Those persons with RA with either “no confidence” or “low confidence” to engage in moderate physical activity at least 3 times per week were 4.1 and 3.1 times more likely to suffer from depression than those who had “high” confidence in engaging in physical activity at least 3 times per week (Murphy et al. 2012). Only 60 percent of men and 53 percent of women with diagnosed depression, anxiety or both reported pursuing treatment for such over the past twelve months; 53 percent of men are seeking treatment for RA and 43 percent for women with an arthritic diagnosis (Murphy et al. 2012).

Patients with RA and depression have worse health outcomes, including poor medical adherence, increased health services utilization, pain, disability and death (Margaretten et al. 2011). In patients with RA, poor clinical characteristics and function

are associated with subsequent depressive symptoms (Margaretten et al. 2011). RA disease factors associated within depression in RA patients include pain, functional status and clinical remission (Margaretten et al. 2011).

One in 10 adults, > 20 years of age, who positively screened for arthritis had experienced a major depressive episode in the previous twelve months (Fuller-Thomson et al. 2009). Those persons with > than two conditions to include arthritis were 2.2 times more likely to suffer from a major depressive disorder than those only experiencing arthritis (Fuller-Thomson et al. 2009). Likewise, those persons with > than two conditions to include arthritis were 2.1 times more likely to suffer from suicidal ideation than those only experiencing arthritis (Fuller-Thomson et al. 2009).

2.14 RESEARCH QUESTIONS/HYPOTHESIS

This study will examine one research question and three hypotheses:

(Q1) What is the relationship between “perceived” (P) depression and those who meet the DSM-IV positively screened criteria for MDD?

(H1) Those persons age 65 and older who report being diagnosed by a physician as having arthritis (P/E) will be significantly more likely to be suffering from MDD than those who have not been diagnosed with an arthritic condition.

(H2) Those persons age 65 and older who self-report arthritis (no reported physician diagnosis) [P/E] will be significantly more likely to be suffering from MDD than those who have not been diagnosed with an arthritic condition.

CHAPTER THREE: METHODS

3.1 DATA SOURCE AND STUDY POPULATION

Data from the National Epidemiological Survey on Alcohol and related Conditions (NESARC) 2001-2002 were used to conduct the analysis. NESARC is a nationwide household survey designed and conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). NESARC used a representative sample of the civilian, noninstitutionalized adult population in the United States, including all 50 States and the District of Columbia. The fieldwork for the survey was completed under NIAAA's direction by trained U.S. Census Bureau Field Representatives who interviewed 43,093 respondents, 18 years of age and older in face-to-face household settings. The population of interest in this study consisted of persons age 65 years and greater (n=8,205). The household response rate for the NESARC was 89 percent, and the person response rate was 93 percent, yielding an overall response rate of 81 percent. ("National Epidemiologic Survey on Alcohol and Related Conditions," 2001-2002)

3.2 STUDY VARIABLES

Dependent Variable:

Major depression was defined by utilizing diagnostic criteria identified in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and the specific questions outlined within the NESARC survey. The diagnostic screening for major depression consists of nine criteria in which one of the symptoms present must be either depressed mood or loss of interest or pleasure

Per the DSM-IV, a respondent must have either (1) depressed mood or (2) a loss of interest or pleasure in order to be diagnosed with major depression (Table 3.1). If this requirement is met, the respondent then must respond positively to at least four of seven criteria in order to screen positively for major depression. The question which addressed the depressed mood criteria was: “In your entire life, have you ever had a time when you felt sad, blue, depressed, or down most of the time for at least two weeks?” The second question asked “In your entire life, have you ever had a time, lasting at least two weeks, when you didn’t care about the things that you usually cared about or when you didn’t enjoy the things you usually enjoy?” A positive response to this question was coded as affirming a loss of interest or pleasure.

The next four questions addressed the DSM-IV diagnostic requisite for a diagnosis of depression of “significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day”. This criteria was evaluated by a series of four questions: “Lose at least 2 pounds a week for several weeks or at least 10 pounds altogether within a month other than when you were physically ill or dieting?”, “Lose your appetite nearly every day for at least two weeks?”, “Gain at least 2 pounds a week for several weeks or at least 10 pounds altogether within a month (other than when you were growing or pregnant)?”, and “Find that you wanted to eat a lot more than usual for no special reason, most days for at least two weeks?” If the respondent identified that any of the four questions were applicable, they were positively coded for standard three (Table 3.1).

The fourth DSM-IV criteria, “insomnia or hypersomnia nearly every day,” was captured within the NESARC survey by three questions: “Have trouble falling asleep

nearly every day for at least two weeks?”, “Wake up too early nearly every day for at least two weeks?”, and “Sleep more than usual nearly every day for at least two weeks?” If the individual responded that any of the three questions applied, they were positively coded for standard four (Table 3.1).

The fifth DSM-IV criterion required a positive response with regard to three questions. The questions were “Move or talk much more slowly than usual, most days for at least two weeks?”, “Become so restless that you fidgeted or paced most of the time for at least two weeks?”, and “Become so restless that you felt uncomfortable for at least two weeks?” The related DSM-IV criterion state that “psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)” must be met in order to meet the requisite needed for diagnosis (Table 3.1).

The sixth DSM-IV criteria asks the respondent if he/she, “Feels tired nearly all of the time or get tired easily most days for at least two weeks, even though you weren’t doing more than usual?” The DSM-IV suggests that “fatigue or loss of energy nearly every day” must be met in order to meet the requirements under criterion six (Table 3.1).

The seventh DSM-IV criterion evaluated the following two questions: “Feel worthless nearly all of the time for at least two weeks?”, and “Feel guilty about things you normally wouldn’t feel guilty about, most of the time for at least two weeks?” Again, if the respondent answered positively for either of the questions, it was coded as meeting the requirement for criterion seven. The DSM-IV measurement for criteria seven stated “feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick) [Table 3.1].

The eighth DSM-IV criterion asked the following two questions: “Having trouble concentrating or keeping your mind on things, most days for at least two weeks?”, and “Find it harder than usual to make decisions, most of the time for at least two weeks?” A positive response for either question was coded as a positive association with requirement eight. The DSM-IV identifies the eighth measurement as “diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others) [Table 3.1].

The final requisite DSM-IV criterion (ninth) inquired regarding the following four questions: “Attempt suicide?”, “Think about committing suicide?”, “Feel like you wanted to die?”, and “Think a lot about your own death?” Any positive response to any of the four questions was coded as meeting the requirements for the ninth criteria. The DSM-IV identifies the ninth standard as “recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide” (Table 3.1).

Coding was conducted while following the DSM-IV requirements for major depression diagnosis. The DSM-IV states that “five (or more) of the listed symptoms have been present during the same two week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure” (Table 3.1). SAS coding was conducted to ensure that either criteria one or two was met while including that at least four of the remaining standards were also deemed positive by the respondent. This allowed for the positive screening of major depression within the older population surveyed by the NESARC study.

Table 3.1 Coding of Major Depression Criteria Among Population 65 Years and Older, NESARC 2001-2002.

Diagnostic indicator	Criteria or Subset	Question (s)	Coding
<i>Depressed mood</i>	<i>1</i>	“In your entire life, have you ever had a time when you felt sad, blue, depressed, or down most of the time for at least two weeks?”	Yes
			See Criteria 2
			No
			See Criteria 2
<i>Loss of interest or pleasure</i>	<i>2</i>	“In your entire life, have you ever had a time, lasting at least two weeks, when you didn’t care about the things that you usually cared about or when you didn’t enjoy the things you usually enjoy?”	Yes
			Meet at least 4 of 7 criteria below
			No (Yes, Criteria 1)
			Meet at least 4 of 7 criteria below
<i>Weight</i>	<i>3</i>		No (No, Criteria 1)
			No major depression
			<i>At least 4 of 7 positive</i>
Lose Weight	3/1	“Lose at least 2 pounds a week for several weeks or at least 10 pounds altogether within a month other than when you were physically ill or dieting?”	Yes
			Positive Criteria 3
			No
			Check Subset 3/2-3/4
Lose Appetite	3/2	“Lose your appetite nearly every day for at least two weeks?”	Yes
Consistent Weight Gain	3/3	“Gain at least 2 pounds a week for several weeks or at least 10 pounds altogether within a month (other than when you were growing or pregnant)?”	Yes
			Positive Criteria 3
			No
			Check Subset 3/4
Excessive Eating	3/4	“Find that you wanted to eat a lot more than usual for no special reason, most days for at least two weeks?”	Yes
			Positive Criteria 3
			No
			Negative Criteria 3 if No to all Subsets (3/1-3/4)
<i>Sleeping Patterns</i>	<i>4</i>		
Trouble Sleeping	4/1	“Have trouble falling asleep nearly every day for at least two weeks?”	Yes
			Positive Criteria 4
			No
Waking Early	4/2	“Wake up too early nearly every day for at least two weeks?”	Check Subset 4/2
			Yes
			Positive Criteria 4
Excessive Sleep	4/3	“Sleep more than usual nearly every day for at least two weeks?”	No
			Check Subset 4/3
			Negative Criteria 4 if No to all Subsets (4/1-4/3)

Anxious Symptoms	5		
Slowed Speech	5/1	“Move or talk much more slowly than usual, most days for at least two weeks?”	Yes
			Positive Criteria 5
			No
			Check Subset 5/2
Restlessness 1	5/2	“Become so restless that you fidgeted or paced most of the time for at least two weeks?”	Yes
			Positive Criteria 5
			No
			Check Subset 5/3
Restlessness 2	5/3	“Become so restless that you felt uncomfortable for at least two weeks?”	Yes
			Positive Criteria 5
			No
			Negative Criteria 5 if No to all Subsets (5/1-5/3)
Fatigue	6		
Fatigue/Lose of Energy	6/1	“Feel tired nearly all of the time or get tired easily most days for at least two weeks, even though you weren’t doing more than usual?”	Yes
			Positive Criteria 6
			No
			Negative Criteria 6 if No to Subset 6/1
Worthlessness/Guilt	7		
Worthlessness	7/1	“Feel worthless nearly all of the time for at least two weeks?”	Yes
			Positive Criteria 7
			No
			Check Subset 7/2
Guilt	7/2	“Feel guilty about things you normally wouldn’t feel guilty about, most of the time for at least two weeks?”	Yes
			Positive Criteria 7
			No
			Negative Criteria 7 if No to all Subsets (7/1-7/2)
Cognitive Ability	8		
Concentration	8/1	“Having trouble concentrating or keeping your mind on things, most days for at least two weeks?”	Yes
			Positive Criteria 8
			No
			Check Subset 8/2
Decision-making	8/2	“Find it harder than usual to make decisions, most of the time for at least two weeks?”	Yes
			Positive Criteria 8
			No
			Negative Criteria 8 if No to all Subsets (8/1-8/2)
Suicide	9		
Attempted	9/1	“Attempt suicide?”	Yes
			Positive Criteria 9
			No
			Check Subset 9/2
Considering	9/2	“Think about committing suicide?”	Yes
			Positive Criteria 9
			No
			Check Subset 9/3
Feeling of positive death	9/3	“Feel like you wanted to die?”	Yes
			Positive Criteria 9
			No

			Check Subset 9/4
		"Think a lot about your own death?"	Yes
			Positive Criteria 9
			No
			Negative Criteria 9 if No to all Subsets (9/1-9/4)
Think of own death	9/4		

Independent Variable of Interest:

Within this study, there will be two independent variables of interest. The first variable will be the patient's identifying that they have arthritis without a physician's diagnosis. The second variable will be the patient's account that a physician has told them they have arthritis. This will be utilized to examine Andersen's theoretical framework in which the outcome category identifies the important of both the "perceived health status" and the "evaluated health status" within the context of the developed blended framework.

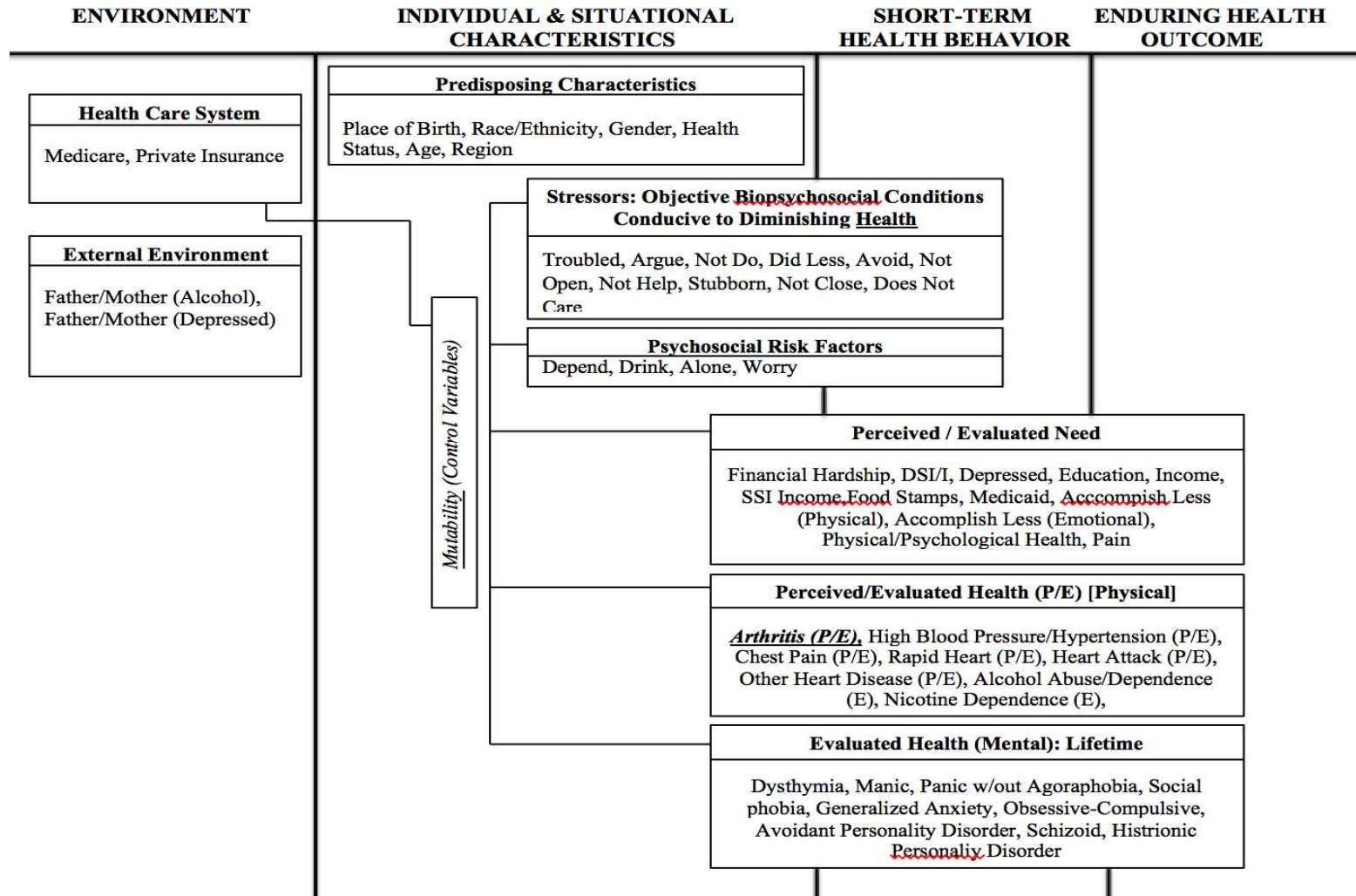
Control Variables:

Both Andersen's (1995) and House's (2001) theoretical framework will be utilized to describe the "control variables" description. Andersen's model provides a particular focus on access to health services and includes the following categorical areas: environment, population characteristics, health behavior, and outcomes. Each of these categories has particular subcategories that will be evaluated for proper variable selection. Likewise, House's (2001) model will be utilized to account for variables based on categorical elements within the model, focusing more on the psychological and behavioral element of wellness and prevention (Figure 2.6). These categories are as follows: race/ethnicity, gender, social/political/economic conditions and policy, socioeconomic status, explanatory variables (including medical care/insurance,

psychosocial risk factors, and physical/chemical and social environmental hazards), and health outcomes. The aim is to ensure the inclusion of cognitive/behavioral and psychological variables into each model (as appropriate) to account for collaborative, coordinated, and integrated care to reduce the potential of comorbid and/or future chronic care. Limitations are related to the NESARC dataset and the particular variables available for selection and modeling.

Table 3.2 represents a combination of the blended framework (Figure 2.6) and control variable selection. The description below will focus on the methods for NESARC data coding as well as the categorization of the blended framework (categories: (1) environment (2) individual & situational characteristics (3) short-term health behavior (4) enduring health outcome. It is also important to note that although we have categorized variables the subcategories developed (Table 3.2) blend into like categories, demonstrating the potential influence of addressed and non-addressed issues concerning health and impacting the enduring health outcome over time. Lastly, mutability is incorporated in the variable classification model (Andersen 1995) showing which variables have the potential for intervention within the selection criteria.

Table 3.2 Andersen (1995) / House's (1981, 2001) Blended Conceptual Framework Control Variable Categorization



Within the category of “environment”, there are two developed subcategories: “health care system” and external environment”. The following two control variables were selected under “health care system”, given their direct impact on access: (1) medicare (2) private insurance. The NESARC dataset surveyed the “medicare” variable by asking, “currently covered by medicare” with a dichotomous answer of “yes/no”. “Dichotomous” in description going forward will mean a “yes/no” response within the dataset unless otherwise described. Likewise, the “private insurance” variable was dichotomous and asked, “currently covered by private health insurance”.

The dichotomous variable “father/mother (alcohol)” will be a recoded variable from two dichotomous questions within the dataset, “blood/natural father ever an alcoholic or problem drinker” and “blood/natural mother ever an alcoholic or problem drinker”. The newly created variable (parental alcohol) will be coded as (1) none (2) either (3) both. Likewise, “father/mother (depressed)” will be recoded from two dichotomous questions, “blood/natural father ever depressed” and “blood/natural mother ever depressed”. This newly recoded variable (parental depressed) will be constructed as (1) none (2) either (3) both.

The next category for which control variables need to be described is “individual and situational characteristics.” This section will only describe those variables within the “predisposing characteristics” subcategory, although other subcategories blend into this category. The “place of birth” variable identified whether the respondent was born within the US or outside the boundaries of the fifty states. “Race/Ethnicity” was coded into the following categories: Non-Hispanic White, Non-Hispanic Black, Hispanic, Non-Hispanic Other. All categories inconsistent with selections within the NESARC survey

were distributed into the Non-Hispanic Other category. “Gender” identified whether the respondent was male or female. “Health status” accounted for the perception of the respondent’s current health within the following five levels: excellent, very good, good, fair, and poor. The “region” variable divided the geographical area of the US into four areas of interest: Northeast, Midwest, South, and West. “Age” was stratified into the following three levels: 65-74 years (youngest old), 75-84 years (middle old), and 85+ years (oldest old).

The third category of evaluation within the blended framework is the “short-term health behavior” category. The following subcategories and elements of subcategories (perceived health) will be accounted for in this category both within variable description and incremental modeling: (1) stressors: objective biopsychosocial conditions conducive to diminishing health (2) psychosocial risk factors (3) perceived/evaluated need (4) perceived health (physical). Within subcategory (1), “troubled” is dichotomous and coded as “felt troubled because of way you felt/often wished could get better”. “Argue” is also dichotomous and coded as “had arguments/friction with family, friends, people at work, or anyone else”. “Not do” is dichotomous and accounts as “couldn’t do things usually did/wanted to do”. “Did less”, again is dichotomous, and asks respondent if “did a lot less than usual or were less active”. “Avoid” is dichotomous and is coded as “avoid jobs or tasks that deal with a lot of people”. “Not open” is a dichotomous variable asking if the respondent “find it hard to be open even with people you are close to”. “Not help” is dichotomous and asks respondent if “hard to let others help if they don’t agree to do things exactly the way you want”. “Stubborn” is dichotomous and asks “have others told you that you are stubborn or rigid”. “Not close” is another dichotomous variable asking

the respondent “are there very few people you’re really close to outside your immediate family”. Lastly, “does not care” is dichotomous and asks “the sort of person who doesn’t care about what people think of you”.

The next subcategory for which variables will be examined is under the “psychosocial risk factors” categorization and will be associated with the category of “individual and situational characteristics”. “Depend” is coded as dichotomous and asks if the respondent “depends on others to handle important areas in life”. “Drink” refers to the consumption of alcohol and was divided into three levels of interest: current drinker, ex-drinker, and lifetime abstainer. “Alone” was recoded to produce a dichotomous variable capturing “living alone” or “not living alone”. “Worry” is a dichotomous variable and asked if they “worry a lot about being left alone to take care of self”.

Another subcategory of short-term health behavior, “perceived / evaluated need” will utilize several NESARC dataset control variables. “Financial hardship” was a dichotomous variable that asked if the respondent “experienced major financial crisis, bankruptcy, or unable to pay bills on time in last 12 months”. “DSI/I” (death serious illness/injury) Death, Serious Illness/Injury (DSI/I) is a hybrid variable, which takes into account if the respondent experienced death or serious illness/injury of a close family member or friend within the previous 12 months. DSI/I is a combination of variables to include “death” and “injury” questions within the dataset. The particular question regarding death extracted from the survey was “any family members or close friends die in the past twelve months?” Likewise, the specific question associated with illness/injury was “any family members or close friends had serious illnesses or injuries in the past twelve months? Coding was conducted to capture the significance of either of these

instances of occurring. DSI/I is divided into three levels of measurement: none, either, or both.

“Education” was recoded into the following four levels of educational achievement: some high school or less, completion of high school, some college, and college graduate. The original question stratified the sample into fourteen different academic standards. However, the cross sectional nature of this study required the recoding of levels in order to maintain sample sizes significant enough to provide accuracy.

The “Income level” variable was based on total personal income and not family income. The NESARC survey stratified total personal income into seventeen identifiable categories. The cross sectional representation of this study required the limiting of categorical levels, thus personal income was adjusted into five levels to include the following: \$0-10,000, \$10,001-\$20,000, \$20,001-\$30,000, \$30,001-\$40,000, and \$40,001. “SSI Income” was a dichotomous variable asking the respondent if he or she “personally received supplemental security income (SSI) in last 12 months”.

“Medicaid” is a dichotomous variable and it was determined to be recorded here as a “need-based” variable versus under the category of “health care system”, following a blended model favoring House versus Andersen’s health services (access) approach. The variable is dichotomous and stated “currently covered by Medicaid” within the survey.

“Food stamps” was another dichotomous variable included within the “need” subcategory.

“Accomplished less (physical)” asked the respondent “during the past 4 weeks, how often accomplished less than would like as a result of physical health”. The options

for response are as follows: (1) all of the time (2) most of the time (3) some of the time (4) a little of the time (5) none of the time. Likewise, the variable “accomplished less (emotional)” asks the respondent “during the past 4 weeks, how often accomplished less than would have liked as result of emotional problems”. The options for response are as follows: (1) all of the time (2) most of the time (3) some of the time (4) a little of the time (5) none of the time. Another variable, “physical/psychological health” asked “during the past 4 weeks, how often physical health or emotional problems interfered with social activities”. The options for response are as follows: (1) all of the time (2) most of the time (3) some of the time (4) a little of the time (5) none of the time. “Pain” was another variable of interest asking the respondent “during past 4 weeks, extent to which pain interfered with normal work. The response options were as follows: (1) not at all (2) a little bit (3) moderately (4) quite a bit (5) extremely.

The following variables described are those physiological variables in which the respondent “perceives” to have the particular listed ailment. “Arthritis” is a dichotomous variable in which the respondent was asked “had arthritis in last 12 months”. It is important to note here as well that “arthritis” is highlighted (Table 3.2), as it is the independent variable of interest within the study.

“High blood pressure/hypertension” is dichotomous as well and asked if the respondent “had high blood pressure or hypertension in last 12 months”. “Chest pain” was another dichotomous variable and the survey inquired if the respondent “had chest pain or angina pectoris in last 12 months”. “Rapid heart” was also a dichotomous variable asking if “had rapid heartbeat or tachycardia in last 12 months”. “Heart attack” is dichotomous as well asking if the respondent “had heart attack or myocardial infarction

in last 12 months”. Lastly, “other heart disease” was dichotomous and asked if “had any other form of heart disease in last 12 months”.

The final category reviewed by the blended framework is “enduring health outcome”. Physical health need (evaluated) is included here and will include all the physical areas of diagnoses (reported diagnosed by a doctor) in the previous paragraph minus the inclusion of “alcohol abuse/dependence” and “nicotine dependence”. The NESARC dataset established both “alcohol abuse/dependence” and “nicotine dependence” through the “evaluated” review of coding for diagnoses, much the same as seen later, concerning the “evaluated” health (mental) within the dissertation. “Alcohol abuse/dependence” was reported as “alcohol abuse/dependence in last 12 months” with responses in coding as such: (0) no alcohol diagnosis (1) alcohol abuse only (2) alcohol dependence only (3) alcohol abuse and dependence. “Nicotine dependence” is a dichotomous variable reported as “nicotine dependence – lifetime”.

“Arthritis (E)” [Table 3.2] is a dichotomous variable in which the respondent was asked “did doctor or other health professional confirm diagnosis”.

“High blood pressure/hypertension (E)” is dichotomous as well and asked if the respondent “did doctor or other health professional confirm diagnosis”. “Chest pain (E)” was another dichotomous variable and the survey inquired if the respondent “did doctor or other health professional confirm diagnosis”. “Rapid heart (E)” was also a dichotomous variable asking if “did doctor or other health professional confirm diagnosis”. “Heart attack (E)” is dichotomous as well asking if the respondent “did doctor or other health professional confirm diagnosis”. Lastly, “other heart disease (E)” was dichotomous and asked if “did doctor or other health professional confirm diagnosis”.

3.3 ANALYTICAL APPROACH

Analytic procedures were conducted by utilizing SAS statistical analysis software (Cary, North Carolina) to emulate the requirement within the DSM-IV. Frequency distributions were compared prior to and after recoding variables to ensure that proper alterations were similar to those originally intended within the NESARC survey. SUDAAN was used to account for the complex weighted sampling structure of the NESARC.

The bivariate analysis of each variable, as it related to major depression, was conducted while using both SAS and SUDAAN and the cross-tabulation procedure. Chi-squared tests were also conducted to establish the relationship between characteristics and DSM-IV criteria-based MDD. Logistics regression was utilized to produce bivariate odds ratios for major depression.

Multiple logistic regression analysis was conducted using an incremental approach to modeling while accounting for variable categorizations within both Andersen (1995) and House's (2001) conceptual frameworks. The incremental modeling will consist of "blending" the conceptualized framework subcategories with the "perceived" and "evaluated" variable responses as outlined in Figure 2.6 and Table 3.2. Individual models will be analyzed while providing stabilizing results associated with each of the subcategories of interest. Variable modeling demonstrated the relationship between arthritis and having or not having MDD.

The formula utilized given the previously listed variables is as follows:

$$\widehat{Y} = \widehat{\beta}_0 + \widehat{\beta}_1 X_1 + \widehat{\beta}_2 X_2 + \dots + \widehat{\beta}_n X_n + \varepsilon$$

Where:

- \widehat{Y} = log of the predicted odds of having major depression;
- $\widehat{\beta}_0$ = intercept;
- $\widehat{\beta}_1$ = regression coefficient for the independent variable X_1 ;
- $\widehat{\beta}_2$ = regression coefficient for the independent variable X_2 ;
- $\widehat{\beta}_n$ = regression coefficient for the n^{th} independent variable;
- $X_1, X_2, X_3, X_4, \dots, X_n$ are independent covariates included in the model; and ε = error term

CHAPTER FOUR: RESULTS

4.1 DESCRIPTION OF THE POPULATION

Descriptive Characteristics (Predisposing Characteristics):

There were 8,205 seniors surveyed within the NESARC dataset (2001-02). Of these, 609 reported having arthritis (P/E) [Table 4.1]. Those born in the U.S. accounted for 88.5% of those surveyed within the study and 70.5% of those surveyed were considered “Non-Hispanic White” [Table 4.1]. When considering gender, 62.2% were female and 37.8% were male. Those responding to have either “fair” or “poor” health were 34.8% while those identifying to have “excellent” or “very good” health were 33.3% (Table 4.1). Those older persons surveyed to be 65-74 in years of age were 52.4%, those 75-84 were 36.2%, and those 85+ in age were 11.4%. Those with “some college” or “college graduates” were 47.2% compared to those with “some high school/less” and “complete high school” to be 64.7% (Table 4.1). Seniors reporting to have Medicare was 93.0%, Medicaid was 10.5% and private insurance was 56.6%. Income levels about \$30,001 was reported by 32.6% of seniors while 49.0% elderly persons surveyed reported having incomes below \$20,000 per year. Of the older population surveyed, 7.4% reported receiving SSI income and 4.7% disclosed receiving food stamps. Financial hardship (previous 12 months) was reported by 3.6% of seniors in the survey (Table 4.1).

Descriptive Characteristics (Biopsychosocial Conditions):

Seniors within the survey disclosed that 8.0% had biological mothers who were

depressed and 4.2% had depressed fathers (Table 4.2). The elderly sample also reported that 1.8% had fathers who were alcoholics and 10.8% had alcoholic mothers (Table 4.2). Those who either had lost a family member or close friend (previous 12 months) or had a close friend suffering from a serious illness or injury (DSI/I) were 30.4% and those whom had experienced “both” were 22.7% in number. The sample also reported that 8.0% considered themselves to be “not open”, 15.0% would not ask for help when needed, and 29.3% considered themselves to be “stubborn” (Table 4.2).

Descriptive Characteristics (Medical Comorbidities):

Seniors experiencing self-reported pain “moderately”, “quite a bit” and “extremely” were 35.4% (Table 4.3). Elderly persons within the sample reporting to have hypertension (P/E) were 48.7%, those reporting chest pain (P/E) were 12.7%, and elderly persons reporting previously experiencing a heart attack were 3.3% (Table 4.3). Older persons within the survey who reported having a rapid heartbeat (P/E) were 11.5% while those reporting any “other heart disease (P/E)” were 8.8% (Table 4.3). Those persons within the survey evaluated (E) for “alcohol abuse only” were 11.6% while those who were evaluated (E) for both alcohol abuse and dependence were 2.8% (Table 4.3). Seniors within the survey whom were evaluated (E) nicotine dependence were 8.3% (Table 4.3).

4.2 DESCRIPTIVE / BIVARIATE ANALYSIS [MDD]

Risk Factors (Predisposing and Enabling Characteristics):

Predisposing and enabling characteristics were controlled for given their potential impact of influencing multivariate outcomes with regards to MDD.

Those persons experiencing arthritis (P/E) were significantly more likely to suffer from MDD [OR 2.00; 95% CI: 1.52, 2.65] than those whom did not suffer from arthritis (P/E). Women were significantly more likely to suffer from MDD than men [OR 2.09; 95% CI: (1.73, 2.53)]. Nearly 16 percent of all women were positively screened for MDD contrasted with only 8 percent of senior males.

Those seniors in either “fair” [OR 1.67; 95% CI: (1.26, 2.20)] or “poor” [OR 2.48; 95% CI: (1.82, 3.37)] were significantly more likely to suffer from MDD than those self-reporting “excellent” health condition. Those in “fair” health status and screening positive for MDD were nearly 15 percent of the “fair” sample while those in “poor” health status screening positive for MDD were nearly 21 percent of those sampled within the “poor” health status sub-category. Comparatively, only 9 percent of those in “excellent” health status suffered from MDD (Table 4.1).

Seniors ages 75-84 were significantly less likely [OR 0.80; 95% CI: (0.67, 0.95)] to suffer from MDD than those ages 65-74 (referent group); and those 85+ were also significantly less likely to suffer from MDD [OR 0.54; 95% CI: (0.41, 0.71)] than those seniors in the referent group (Table 4.1).

Seniors who reportedly accepted SSI income were significantly more likely to be suffering from MDD [OR 1.49; 95% CI: (1.12, 1.98)] than those who did not accept or qualify for SSI income. Likewise, those who reportedly accepted food stamps were significantly more likely to suffer from MDD [OR 1.88; 95% CI: (1.30, 2.73)] than those who did not accept or qualify for food stamps (Table 4.1).

Seniors who self-reported financial hardship over the past 12 months were significantly more likely to experience MDD [OR 4.00; 95% CI: (2.94, 5.45)]. Those

seniors who also report both receiving SSI income [OR 1.49; 95% CI: (1.12, 1.98)] and food stamps [OR 1.88; 95% CI: (1.30, 2.73)] were significantly more like to suffer from MDD.

Table 4.1 Descriptive Characteristics and Risk Factors for Major Depression, persons 65 and older, 2001-2002 NESARC

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
<i>Hypothesized IV</i>					
Arthritis (P/E)**					0.00
Yes	609 (7.4)	78.82 (2.24)	21.18 (2.24)	2.00 (1.52, 2.65)	
No	7,596 (92.6)	88.17 (0.44)	11.83 (0.44)	1.00	
<i>Predisposing characteristics</i>					
Origin of birth					0.44
U.S. born	7,243 (88.5)	87.67 (0.47)	12.33 (0.47)	0.89 (0.67, 1.19)	
Non-U.S. born	942 (11.5)	86.41 (1.57)	13.59 (1.57)	1.00	
Race/Ethnicity					0.12
Non-Hispanic White	5,776 (70.5)	87.44 (0.51)	12.56 (0.51)	1.00	-
Non-Hispanic Black**	1,355 (16.5)	90.06 (1.07)	9.94 (1.07)	0.77 (0.60, 0.99)	0.04
Hispanic	895 (10.9)	87.49 (1.49)	12.51 (1.49)	1.00 (0.74, 1.34)	0.98
Non-Hispanic other	171 (2.1)	84.64 (2.64)	15.36 (2.64)	1.26 (0.84, 1.89)	0.25
Sex**					0.00
Male	3,104 (37.8)	91.91 (0.59)	8.09 (0.59)	1.00	
Female	5,101 (62.2)	84.43 (0.65)	15.57 (0.65)	2.09 (1.73, 2.53)	
Health status**					0.00
Excellent	983 (12.0)	90.45 (1.02)	9.55 (1.02)	1.00	-
Very good	1,749 (21.4)	90.66 (0.78)	9.34 (0.78)	0.98 (0.73, 1.31)	0.87
Good	2,580 (31.6)	88.45 (0.76)	11.55 (0.76)	1.24 (0.93, 1.65)	0.14
Fair**	1,938 (23.7)	85.05 (1.00)	14.95 (1.00)	1.67 (1.26, 2.20)	0.00
Poor**	915 (11.2)	79.28 (1.60)	20.72 (1.60)	2.48 (1.82, 3.37)	0.00

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
Age**					0.03
65-74	4,301 (52.5)	86.10 (0.60)	13.90 (0.60)	1.00	-
75-84**	2,973 (36.2)	88.56 (0.72)	11.44 (0.72)	0.80 (0.67, 0.95)	0.01
85+**	931 (11.3)	92.02 (0.97)	7.98 (0.97)	0.54 (0.41, 0.71)	0.00
Region					0.24
Northeast	1,684 (20.5)	89.23 (0.95)	10.77 (0.95)	1.00	-
Midwest	1,758 (21.4)	87.30 (0.86)	12.70 (0.86)	1.21 (0.94, 1.55)	0.14
South	3,135 (38.3)	87.53 (0.75)	12.47 (0.75)	1.18 (0.93, 1.50)	0.17
West**	1,628 (19.8)	86.26 (0.95)	13.74 (0.95)	1.32 (1.02, 1.70)	0.03
Education					0.99
Some high school/less	2,645 (32.2)	87.36 (0.82)	12.64 (0.82)	1.03 (0.81, 1.30)	0.80
Complete high school	2,665 (32.5)	87.66 (0.72)	12.34 (0.72)	1.00 (0.82, 1.23)	0.98
Some college	1,206 (14.7)	87.59 (1.12)	12.41 (1.12)	1.01 (0.77, 1.32)	0.95
College graduate	1,689 (20.6)	87.69 (0.92)	12.31 (0.92)	1.00	-
Medicare					0.19
Yes	7,629 (93.0)	87.40 (0.47)	12.60 (0.47)	1.30 (0.88, 1.94)	
No	576 (7.0)	90.03 (1.73)	9.97 (1.73)	1.00	
Medicaid					0.45
Yes	865 (10.5)	86.54 (1.34)	13.46 (1.34)	1.11 (0.85, 1.44)	
No	7,340 (89.5)	87.67 (0.50)	12.33 (0.50)	1.00	
Private Insurance					0.71
Yes	4,647 (56.6)	87.44 (0.59)	12.56 (0.59)	1.03 (0.87, 1.22)	
No	3,558 (43.4)	87.78 (0.68)	12.22 (0.68)	1.00	

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
Income level					0.20
\$0-\$10,000	1,709 (20.8)	86.40 (0.91)	13.60 (0.91)	1.13 (0.90, 1.42)	0.29
\$10,001-\$20,000	2,312 (28.2)	86.55 (0.88)	13.45 (0.88)	1.12 (0.90, 1.39)	0.32
\$20,001-\$30,000	1,506 (18.4)	88.27 (0.96)	11.73 (0.96)	0.96 (0.74, 1.22)	0.71
\$30,001-\$40,000	949 (11.6)	89.21 (1.12)	10.79 (1.12)	0.87 (0.66, 1.15)	0.32
\$40,001-higher	1,729 (21.0)	87.79 (0.90)	12.21 (0.90)	1.00	-
SSI Income**					0.01
Yes	607 (7.4)	82.86 (1.88)	17.14 (1.88)	1.49 (1.12, 1.98)	
No	7,598 (92.6)	87.82 (0.47)	12.18 (0.47)	1.00	
Food Stamps**					0.00
Yes	387 (4.7)	79.29 (3.03)	20.71 (3.03)	1.88 (1.30, 2.73)	
No	7,818 (95.3)	87.81 (0.45)	12.19 (0.45)	1.00	
Financial hardship**					0.00
Yes	293 (3.7)	65.10 (3.32)	34.90 (3.32)	4.00 (2.94, 5.45)	
No	7853 (96.3)	88.18 (0.44)	11.82 (0.44)	1.00	

Risk Factors (Biopsychosocial Conditions):

Biopsychosocial conditions were measured to account for the behavioral and psychological responses relating to the overall health condition of those potentially screening for MDD.

Those seniors whose biological mother [OR 4.69; 95% CI: (3.76, 5.84)] or father [OR 3.80; 95% CI: (2.83, 5.11)] were depressed were significantly more likely to suffer from MDD than those who reported their biological mother or father not being depressed as compared to the results within (Table 4.2).

Those seniors whose father was self-reported to have been an alcoholic [OR 3.04; 95% CI: (1.97, 4.71)] and those who reported their mother to have been an alcoholic [OR 1.86; 95% CI: (1.50, 2.30)] were significantly more likely to screen positive for MDD.

Those seniors who either had a close family member or friend die (last 12 months) or had a close family member or friend experience serious injury or illness (DSI/I) [Table 4.2] were significantly more likely to suffer from MDD [OR 1.56; 95% CI: (1.28, 1.90)] than those who did not and, if they experienced “both”, they were also significantly more likely to suffer from MDD [OR 2.00; 95% CI: (1.64, 2.43)] than those who did not report an experience of any of the conditions above.

Those seniors surveyed who were “not open” [OR 2.48; 95% CI: (1.98, 3.11)], did not ask for help when needed [OR 1.77; 95% CI: (1.46, 2.15)], and self-reported to be “stubborn” [OR 1.60; 95% CI: (1.35, 1.89)] were all significantly more likely to suffer from MDD than those who did not report the listed conditions above (Table 4.2).

Table 4.2 Descriptive Characteristics and Risk Factors for Major Depression, persons 65 and older, 2001-2002 NESARC

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
<i>Biopsychosocial conditions</i>					
Mother depressed**					0.00
Yes	654 (9.2)	65.87(2.08)	34.13 (2.08)	4.69 (3.76, 5.84)	
No	6,461 (90.8)	90.05 (0.47)	9.95 (0.47)	1.00	
Father depressed**					0.00
Yes	339 (5.0)	68.37 (3.11)	31.36 (3.11)	3.80 (2.83, 5.11)	
No	6,454 (95.0)	89.15 (0.45)	10.85 (0.45)	1.00	
Father (Alcohol)**					0.00
Yes	147 (1.9)	70.16 (4.42)	29.84 (4.42)	3.04 (1.97, 4.71)	
No	7,797 (98.1)	87.74 (0.46)	12.26 (0.46)	1.00	
Mother (Alcohol)**					0.00
Yes	866 (11.2)	80.43 (1.60)	19.57 (1.60)	1.86 (1.50, 2.30)	
No	6,873 (88.8)	88.40 (0.46)	11.60 (0.46)	1.00	
DSI/I**					0.00
None	3,834 (47.3)	90.63 (0.55)	9.37 (0.55)	1.00	-
Either**	2,442 (30.2)	86.13 (0.78)	13.87 (0.78)	1.56 (1.28, 1.90)	0.00
Both**	1,818 (22.5)	82.88 (1.17)	17.12 (1.17)	2.00 (1.64, 2.43)	0.00
Not Open**					0.00
Yes	639 (8.1)	75.39 (2.05)	24.61 (2.05)	2.48 (1.98, 3.11)	
No	7,287 (91.9)	88.38 (0.44)	11.62 (0.44)	1.00	
Not Help**					0.00
Yes	1,202 (15.2)	81.23 (1.24)	18.77 (1.24)	1.77 (1.46, 2.15)	

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
No	6,686 (84.8)	88.48 (0.50)	11.52 (0.50)	1.00	
Stubborn**					0.00
Yes	2,350 (29.7)	83.58 (0.91)	16.42 (0.91)	1.60 (1.35, 1.89)	
No	5,558 (70.3)	89.05 (0.51)	10.95 (0.51)	1.00	

Risk Factors (Medical Comorbidities):

Medical comorbidities were added to the model to control for physiological factors associated with MDD or depression (P).

Seniors within the survey who self-reported having pain “not at all” [OR 0.40; 95% CI: (0.30, 0.52)] or “a little bit” [OR 0.64; 95% CI: (0.48, 0.85)] were significantly less likely to experience MDD than those who reported having “extreme” amounts of pain (Table 4.3).

Those persons reporting “hypertension (P/E)” [OR 1.33; 95% CI: (1.13, 1.56)], “chest pain (P/E) [OR 2.60; 95% CI: (2.10, 3.20)] and “rapid heartbeat” [OR 2.03; 95% CI: (1.63, 2.52)] were significantly more likely to experience MDD compared to those who did not report having each of these particular conditions (Table 4.3).

Elderly persons who reported “other heart disease” [OR 1.75; 95% CI: (1.38, 2.21)] were significantly more likely to suffer from MDD than those who did not report having another heart disease (Table 4.3).

Those older persons surveyed who had both an evaluated (E) alcohol abuse and dependency condition [OR 2.40; 95% CI: (1.70, 3.39)] were significantly more likely to suffer from MDD than those without an evaluated (E) alcoholic diagnosis (Table 4.3).

Surveyed seniors who were evaluated (E) to have “nicotine dependence” [OR 2.47; 95% CI: (1.95, 3.13)] were significantly more likely to experience MDD than those without an evaluated condition of “nicotine dependence” (Table 4.3).

Table 4.3 Descriptive Characteristics and Risk Factors for Major Depression, persons 65 and older, 2001-2002 NESARC

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
<i>Medical comorbidities</i>					
Pain					
Not at all**	3,637 (44.7)	91.58 (0.50)	8.42 (0.50)	0.40 (0.30, 0.52)	0.00
A little bit**	1,658 (20.4)	87.19 (0.90)	12.81 (0.90)	0.64 (0.48, 0.85)	0.00
Moderately	1,069 (13.1)	85.65 (1.32)	14.35 (1.32)	0.73 (0.53, 1.00)	0.05
Quite a bit	1,107 (13.6)	79.16 (1.48)	20.84 (1.48)	1.14 (0.85, 1.54)	0.37
Extremely	664 (8.2)	81.28 (1.89)	18.72 (1.89)	1.00	-
Hypertension (P/E)**					
Yes	3,910 (47.7)	85.71 (0.72)	14.29 (0.72)	1.33 (1.13, 1.56)	0.00
No	4,295 (52.3)	88.83 (0.56)	11.17 (0.56)	1.00	
Chest Pain (P/E)**					
Yes	1,018 (12.4)	75.77 (1.81)	24.23 (1.81)	2.60 (2.10, 3.20)	0.00
No	7,187 (87.6)	89.03 (0.44)	10.97 (0.44)	1.00	
Rapid Heart (P/E)**					0.00
Yes	925 (11.3)	79.09 (1.67)	20.91 (1.67)	2.03 (1.63, 2.52)	
No	7,280 (88.7)	88.47 (0.46)	11.53 (0.46)	1.00	
Heart Attack (P/E)					0.15
Yes	265 (3.2)	83.75 (2.75)	16.25 (2.75)	1.35 (0.89, 2.06)	
No	7,940 (96.8)	87.47 (0.47)	12.53 (0.47)	1.00	
Other Heart Disease (P/E)**					

	Total n=8,205 Frequency / %	No Major Depression n=7,148 %(se)	Major Depression n=1,057 %(se)	OR for Major Depression OR (LCL, UCL)	p-value
Yes	709 (8.6)	80.82 (1.70)	19.18 (1.70)	1.75 (1.38, 2.21)	0.00
No	7,496 (91.4)	88.05 (0.47)	11.95 (0.47)	1.00	
Alcohol Abuse/Depend (E)					
No diagnosis	7,005 (85.4)	88.00 (0.47)	12.00 (0.47)	1.00	-
Abuse only	934 (11.4)	88.16 (1.26)	11.84 (1.26)	0.99 (0.76, 1.27)	0.90
Abuse/Depend**	227 (2.8)	75.31 (3.21)	24.69 (3.21)	2.40 (1.70, 3.39)	0.00
Nicotine Depend (E)**					0.00
Yes	663 (8.1)	88.67 (0.44)	11.33 (0.44)	2.47 (1.95, 3.13)	
No	7,542 (91.9)	76.00 (2.03)	24.00 (2.03)	1.00	

Comparing MDD and Depression (P)

It is important to reiterate the differences between the two dependent variables examined within the study: MDD and depression (P). MDD was defined by the NESARC survey which utilized a series of questions to determine the dichotomous responses to those needed by the DSM-IV for a clinician to diagnose a patient with major depressive disorder. Five of nine questions needed to be positive to positively account for MDD within the study. Depression (P) was given a positive response if those seniors surveyed responded positively to the following question, "During the past four weeks, how often have you felt downhearted or depressed"? A positive response required that the respondent answer either "all of the time" or "most of the time".

Among all older adults, 7.32% reported that that they had felt "downhearted or depressed" either all or most of the time during the past four weeks. Self-reported depression was more common among persons who screened positive for MDD (20.40%) than among persons who did not (5.46%) [Table 4.4, below]. It is notable that most older adults who screened positive for depression (79.60%) did not actually self-report depression.

Table 4.4. Overlap between MDD and Depression (P) among persons 65 and older, by reported Arthritis (P/E), NESARC 2001-2002.

<i>Variables</i>	Total (%)	MDD	No MDD	Chi Squared	P Value
Arthritis (P/E) Present (n=609; 7.42%)					
Depression (P)					
Yes	519 (87.06)	429 (83.25)	90 (16.75)	17.94	.0001
No	90 (12.94)	48 (48.99)	42 (51.01)		
Total		477 (78.82)	132 (21.18)		
Arthritis (P/E) Not Present (n=7,596; 92.58%)					

Depression (P)					
Yes	549 (6.87)	177 (32.18)	372 (67.82)	39.61	.0000
No	7,047 (93.13)	748 (10.22)	6,299 (89.78)		
Total		925 (11.73)	6,671 (88.27)		

Multivariate Model [MDD and Depression (P)]

Model 1: MDD {DV} = logit[Arthritis (P/E) {IV of interest}]
 Depression (P) {DV} = logit[Arthritis (P/E) {IV of interest}]

Model 2: MDD {DV} = logit[Arthritis (P/E) {IV of interest} + Predisposing
 Characteristics + Enabling Characteristics]
 Depression (P) {DV} = logit[Arthritis (P/E) {IV of interest} +
 Predisposing Characteristics + Enabling Characteristics]

Model 3: MDD {DV} = logit[Arthritis (P/E) {IV of interest} + Predisposing
 Characteristics + Enabling Characteristics + Biopsychosocial
 Conditions]
 Depression (P) {DV} = logit[Arthritis (P/E) {IV of interest} +
 Predisposing Characteristics + Enabling Characteristics +
 Biopsychosocial Conditions]

Model 4 : MDD {DV} = logit[Arthritis (P/E) {IV of interest} + Predisposing
 Characteristics + Enabling Characteristics + Biopsychosocial
 Conditions + Medical Comorbidities]

Depression (P) {DV} = logit[Arthritis (P/E) {IV of interest} +
 Predisposing Characteristics + Enabling Characteristics +
 Biopsychosocial Conditions + Medical Comorbidities]

Multivariate: Model 1 [MDD]

Those elderly who experienced arthritis (P/E) [OR 2.00; 95% CI: (1.52, 2.65)] were significantly more likely to experience MDD than those who did not experience arthritis (P/E) [Table 4.4].

Multivariate: Model 2 [MDD]

Compared to those who did not experience arthritis (P/E), those who experienced arthritis (P/E) [OR 1.87; 95% CI: (1.41, 2.47)] were significantly more likely to experience MDD [Table 4.4].

Multivariate: Model 3 [MDD]

Arthritis (P/E) was significantly associated with the likelihood of MDD [OR 1.87; 95% CI: (1.31, 2.67)].

Multivariate: Model 4 [MDD]

Those elderly who experienced arthritis (P/E) [OR 1.60; 95% CI: (1.12, 2.28)] were significantly more likely to experience MDD than those who did not experience arthritis (P/E) [Table 4.4].

Multivariate: Model 1 [Depression (P)]

Those seniors surveyed who experienced arthritis (P/E) [OR 2.02; 95% CI: (1.52, 2.68)] were significantly more likely to experience depression (P) than those who did not experience arthritis (P/E) [Table 4.5].

Multivariate: Model 2 [Depression (P)]

Those elderly who experienced arthritis (P/E) [OR 1.34; 95% CI: (0.98, 1.83)] were no more likely to experience depression (P) than those who did not experience arthritis (P/E) [Table 4.5].

Multivariate: Model 3 [Depression (P)]

Those persons suffering from arthritis (P/E) were no more likely [OR 1.40; 95% CI: (0.96, 2.04)] to report depression (P) than those without arthritis (P/E) [Table 4.5].

Multivariate: Model 4 [Depression (P)]

Those persons suffering from arthritis (P/E) were no more likely [OR 1.33; 95% CI: (0.89, 1.99)] to suffer from depression (P) than those not suffering from arthritis (P/E) [Table 4.5].

4.3 MULTIVARIATE ANALYSIS [MDD]

Table 4.5 Factors associated with MDD among population 65 years and older, NESARC 2001-2002.

Table Variables		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Hypothesized IV</i>					
Arthritis	Yes	2.00 (1.52, 2.65)**	1.87 (1.41, 2.47)**	1.87 (1.31, 2.67)**	1.60 (1.12, 2.28)**
	No	1.00	1.00	1.00	1.00
<i>Predisposing Characteristics</i>					
Place of birth	U.S. born		0.96 (0.71, 1.31)	0.79 (0.55, 1.13)	0.74 (0.51, 1.06)
	Non-U.S. born		1.00	1.00	1.00
Race	Non-Hispanic White		1.00	1.00	1.00
	Non-Hispanic Black		0.60 (0.46, 0.79)**	0.71 (0.49, 1.04)	0.72 (0.48, 1.07)
	Hispanic		0.83 (0.58, 1.20)	0.92 (0.61, 1.40)	0.99 (0.66, 1.49)
	Non-Hispanic other		1.06 (0.74, 1.53)	1.65 (1.10, 2.46)	1.72 (1.12, 2.64)
Gender	Male		1.00	1.00	1.00
	Female		2.26 (1.86, 2.75)**	2.15 (1.72, 2.69)**	2.21 (1.74, 2.82)**
Health status	Excellent		1.00	1.00	1.00
	Very good		0.96 (0.71, 1.29)	0.78 (0.56, 1.08)	0.70 (0.50, 0.98)**
	Good		1.21 (0.90, 1.61)	1.03 (0.75, 1.40)	0.84 (0.60, 1.17)
	Fair		1.65 (1.23, 2.20)**	1.31 (0.95, 1.81)	0.91 (0.64, 1.30)
	Poor		2.44 (1.77, 3.38)**	2.02 (1.38, 2.97)**	1.27 (0.79, 2.05)
Age	65-74		1.00	1.00	1.00
	75-84		0.71 (0.59, 0.85)**	0.77 (0.62, 0.96)**	0.81 (0.65, 1.01)
	85+		0.42 (0.32, 0.56)**	0.40 (0.27, 0.57)**	0.43 (0.29, 0.62)**
Region	Northeast		1.00	1.00	1.00

Table Variables		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
	Midwest		1.19 (0.92, 1.53)	1.05 (0.79, 1.40)	0.99 (0.74, 1.32)
	South		1.12 (0.89, 1.41)	1.12 (0.86, 1.46)	1.07 (0.81, 1.41)
	West		1.29 (1.01, 1.65)**	1.17 (0.87, 1.56)	1.09 (0.81, 1.47)
<i>Enabling Characteristics</i>					
Education	Some high school/less		0.90 (0.69, 1.19)	0.89 (0.65, 1.21)	0.86 (0.63, 1.18)
	Complete high school		0.94 (0.75, 1.18)	0.96 (0.72, 1.27)	0.95 (0.72, 1.26)
	Some college		0.94 (0.70, 1.25)	0.95 (0.69, 1.32)	0.94 (0.67, 1.32)
	College graduate		1.00	1.00	1.00
Medicare	Yes		1.24 (0.83, 1.84)	1.13 (0.72, 1.78)	1.11 (0.70, 1.74)
	No		1.00	1.00	1.00
Medicaid	Yes		0.92 (0.66, 1.27)	0.84 (0.58, 1.22)	0.83 (0.57, 1.21)
	No		1.00	1.00	1.00
Private Insurance	Yes		1.17 (0.98, 1.40)	1.02 (0.82, 1.26)	1.02 (0.83, 1.26)
	No		1.00	1.00	1.00
Income level	\$0-\$10,000		0.83 (0.62, 1.10)	0.86 (0.61, 1.23)	0.89 (0.63, 1.25)
	\$10,001-\$20,000		0.98 (0.76, 1.25)	1.04 (0.77, 1.40)	1.03 (0.76, 1.40)
	\$20,001-\$30,000		0.85 (0.65, 1.11)	0.88 (0.63, 1.25)	0.89 (0.63, 1.25)
	\$30,001-\$40,000		0.82 (0.62, 1.10)	0.83 (0.59, 1.17)	0.84 (0.60, 1.20)
	\$40,001-higher		1.00	1.00	1.00
SSI income	Yes		1.13 (0.79, 1.61)	1.15 (0.76, 1.76)	1.14 (0.75, 1.72)
	No		1.00	1.00	1.00
Food stamps	Yes		1.48 (0.96, 2.30)	1.23 (0.72, 2.12)	1.08 (0.63, 1.86)
	No		1.00	1.00	1.00
Financial hardship	Yes		3.82 (2.74, 5.33)**	3.33 (2.19, 5.06)**	2.99 (1.95, 4.56)**
	No		1.00	1.00	1.00

Table Variables		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
<i>Biopsychosocial conditions</i>					
Mother (Depressed)	Yes			3.47 (2.56, 4.69)**	3.33 (2.44, 4.55)**
	No			1.00	1.00
Father (Depressed)	Yes			1.79 (1.21, 2.65)**	1.74 (1.16, 2.62)**
	No			1.00	1.00
Father (Alcohol)	Yes			1.46 (0.72, 2.94)	1.35 (0.66, 2.76)
	No			1.00	1.00
Mother (Alcohol)	Yes			1.41 (1.07, 1.87)**	1.34 (1.00, 1.80)
	No			1.00	1.00
DSI/I	None			0.66 (0.51, 0.85)**	0.69 (0.54, 0.89)**
	Either			1.00	1.00
	Both			1.22 (0.95, 1.58)	1.23 (0.95, 1.59)
Not open	Yes			1.65 (1.22, 2.23)**	1.60 (1.18, 2.16)**
	No			1.00	1.00
Not help	Yes			1.33 (1.02, 1.72)**	1.25 (0.95, 1.64)
	No			1.00	1.00
Stubborn	Yes			1.34 (1.08, 1.66)**	1.27 (1.03, 1.58)**
	No			1.00	1.00
<i>Medical comorbidities</i>					
Pain	Not at all				0.69 (0.46, 1.05)
	A little bit				0.90 (0.60, 1.36)
	Moderately				0.92 (0.58, 1.47)
	Quite a bit				1.26 (0.82, 1.93)
	Extremely				1.00
Hypertension (P/E)	Yes				1.04 (0.85, 1.27)
	No				1.00
Chest pain (P/E)	Yes				1.63 (1.22, 2.16)**
	No				1.00
Rapid heart (P/E)	Yes				1.14 (0.85, 1.53)

Table 3 (Variable)		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
	No				1.00
Heart attack (P/E)	Yes				0.68 (0.35, 1.32)
	No				1.00
Other heart disease (P/E)	Yes				0.94 (0.69, 1.28)
	No				1.00
Alcohol Abuse/Depend (E)	No alcohol				1.00
	Abuse only				1.12 (0.79, 1.60)
	Abuse and depend				1.46 (0.83, 2.55)
Nicotine Depend (E)	Yes				1.82 (1.31, 2.51)**
	No				1.00

** represents all significant variables with a p-value less than or equal to 0.05

Table 4.6 Factors associated with perceived depression among population 65 years and older, NESARC 2001-2002.

Table Variables		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Hypothesized IV</i>					
Arthritis	Yes	2.02 (1.52, 2.68)**	1.34 (0.98, 1.83)	1.40 (0.96, 2.04)	1.33 (0.89, 1.99)
	No	1.00	1.00	1.00	1.00
<i>Predisposing Characteristics</i>					
Place of birth	U.S. born		0.67 (0.45, 0.99)**	0.60 (0.38, 0.95)**	0.58 (0.37, 0.91)**
	Non-U.S. born		1.00	1.00	1.00
Race	Non-Hispanic White		1.00	1.00	1.00
	Non-Hispanic Black		0.76 (0.57, 1.02)	0.79 (0.53, 1.17)	0.81 (0.54, 1.22)
	Hispanic		0.82, 0.55, 1.22)	0.93 (0.58, 1.48)	0.96 (0.60, 1.54)
	Non-Hispanic other		0.95 (0.49, 1.85)	1.11 (0.56, 2.20)	1.15 (0.58, 2.30)
Gender	Male		1.00	1.00	1.00
	Female		1.30 (1.05, 1.61)**	1.25 (0.99, 1.58)	1.22 (0.95, 1.57)
Health status	Excellent		1.00	1.00	1.00
	Very good		1.23 (0.69, 2.18)	1.22 (0.62, 2.37)	1.09 (0.56, 2.12)
	Good		1.67 (0.96, 2.90)	1.64 (0.87, 3.11)	1.35 (0.70, 2.58)
	Fair		3.00 (1.73, 5.21)**	2.64 (1.42, 4.92)**	1.71 (0.90, 3.24)
	Poor		8.92 (5.13, 15.51)**	8.12 (4.20, 15.71)**	4.08 (1.99, 8.36)**
Age	65-74		1.00	1.00	1.00
	75-84		0.93 (0.73, 1.19)	0.93 (0.70, 1.23)	0.92 (0.70, 1.22)
	85+		0.90 (0.64, 1.26)	0.99 (0.66, 1.48)	1.07 (0.71, 1.60)
Region	Northeast		1.00	1.00	1.00
	Midwest		0.90 (0.66, 1.22)	0.84 (0.58, 1.22)	0.80 (0.55, 1.14)
	South		1.04 (0.78, 1.37)	0.94 (0.66, 1.36)	0.89 (0.63, 1.27)
	West		0.87 (0.60, 1.25)	0.82 (0.53, 1.26)	0.77 (0.51, 1.18)

Table 3 (Variable)		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
<i>Enabling Characteristics</i>					
Education	Some high school/less		1.65 (1.13, 2.42)**	1.63 (1.04, 2.57)**	1.57 (0.99, 2.48)
	Complete high school		1.29 (0.90, 1.86)	1.30 (0.86, 1.97)	1.29 (0.85, 1.95)
	Some college		0.89 (0.57, 1.39)	0.87 (0.54, 1.41)	0.86 (0.53, 1.42)
	College graduate		1.00	1.00	1.00
Medicare	Yes		1.39 (0.87, 2.21)	1.42 (0.78, 2.60)	1.43 (0.80, 2.55)
	No		1.00	1.00	1.00
Medicaid	Yes		1.11 (0.80, 1.55)	0.99 (0.65, 1.51)	0.97 (0.63, 1.49)
	No		1.00	1.00	1.00
Private Insurance	Yes		0.72 (0.57, 0.92)**	0.69 (0.52, 0.90)	0.71 (0.54, 0.93)
	No		1.00	1.00	1.00
Income level	\$0-\$10,000		0.89 (0.57, 1.38)	1.20 (0.72, 1.99)	1.23 (0.75, 2.02)
	\$10,001-\$20,000		1.13 (0.76, 1.68)	1.37 (0.88, 2.15)	1.39 (0.89, 2.17)
	\$20,001-\$30,000		0.95 (0.63, 1.44)	1.21 (0.75, 1.95)	1.28 (0.80, 2.06)
	\$30,001-\$40,000		0.97 (0.60, 1.55)	1.30 (0.76, 2.24)	1.33 (0.77, 2.31)
	\$40,001-higher		1.00	1.00	1.00
SSI income	Yes		1.25 (0.85, 1.82)	1.29 (0.81, 2.06)	1.36 (0.86, 2.17)
	No		1.00	1.00	1.00
Food stamps	Yes		1.18 (0.70, 1.99)	1.14 (0.57, 2.32)	1.02 (0.52, 2.03)
	No		1.00	1.00	1.00
Financial hardship	Yes		3.24 (2.20, 4.77)	3.39 (2.17, 5.31)**	2.98 (1.90, 4.68)**
	No		1.00	1.00	1.00
<i>Biopsychosocial conditions</i>					
Mother (Depressed)	Yes			1.14 (0.72, 1.80)	1.11 (0.68, 1.79)

Table 3 (Variable)		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
	No			1.00	1.00
Father (Depressed)	Yes			1.74 (0.97, 3.12)	1.72 (0.93, 3.18)
	No			1.00	1.00
Father (Alcohol)	Yes			1.77 (0.82, 3.80)	1.66 (0.77, 3.58)
	No			1.00	1.00
Mother (Alcohol)	Yes			1.12 (0.78, 1.60)	1.10 (0.76, 1.60)
	No			1.00	1.00
DSI/I	None			0.98 (0.74, 1.29)	1.06 (0.79, 1.42)
	Either			1.00	1.00
	Both			1.31 (0.94, 1.82)	1.34 (0.95, 1.89)
Not open	Yes			1.37 (0.93, 2.03)	1.35 (0.90, 2.02)
	No			1.00	1.00
Not help	Yes			1.18 (0.82, 1.70)	1.10 (0.76, 1.61)
	No			1.00	1.00
Stubborn	Yes			1.16 (0.88, 1.52)	1.09 (0.83, 1.44)
	No			1.00	1.00
<i>Medical comorbidities</i>					
Pain	Not at all				0.25 (0.17, 0.37)**
	A little bit				0.36 (0.24, 0.55)**
	Moderately				0.38 (0.24, 0.62)**
	Quite a bit				0.65 (0.45, 0.95)**
	Extremely				1.00
Hypertension (P/E)	Yes				1.07 (0.81, 1.42)
	No				1.00
Chest pain (P/E)	Yes				1.05 (0.73, 1.52)
	No				1.00
Rapid heart (P/E)	Yes				1.30 (0.92, 1.83)
	No				1.00
Heart attack (P/E)	Yes				0.93 (0.54, 1.60)
	No				1.00

Table 3 (Variable)		Model 1 n=8,205 N=33,764,930 %(se)	Model 2 n=8,128 N=33,505,384 %(se)	Model 3 n=6,384 N=26,718,861 %(se)	Model 4 n=6,380 N=26,709,788 %(se)
Other heart disease (P/E)	Yes				0.73 (0.50, 1.08)
	No				1.00
Alcohol Abuse/Depend (E)	No alcohol				1.00
	Abuse only				1.33 (0.89, 1.99)
	Abuse and depend				1.27 (0.56, 2.90)
Nicotine Depend (E)	Yes				1.12 (0.70, 1.80)
	No				1.00

** represents all significant variables with a p-value less than or equal to 0.05

CHAPTER FIVE: DISCUSSION

5.1 BACKGROUND

The purpose of this study was to explore both positive screened MDD and the perception of being depressed (P) and the likelihood of either increasing if the patient suffered from arthritis (P/E), either perceived or evaluated by a physician. The study explored the univariate, bivariate, and multivariate relationships between MDD and depression (P) to better describe influencing characteristics and their prevalence, as related to MDD and depression (P).

5.2 SUMMARY

It is important to reiterate the differences between the two dependent variables examined within the study: MDD and depression (P). MDD was a positive screening variable that was developed from the NESARC survey which utilized a series of questions to determine the dichotomous responses to those needed by the DSM-IV for a clinician to diagnose a patient with major depressive disorder. Five of nine questions needed to be positive to positively account for MDD within the study. Depression (P) was given a positive response if those seniors surveyed responded positively to the following question, "During the past four weeks, how often have you felt downhearted or depressed"? A positive response required that the respondent answer either "all of the time" or "most of the time".

Among all older adults, 7.32% reported that that they had felt "downhearted or depressed" either all or most of the time during the past four weeks. Self-reported

depression was more common among persons who screened positive for MDD (20.40%) than among persons who did not (5.46%). It is notable that most older adults who screened positive for depression (79.60%) did not actually self-report depression.

The following were the hypotheses projected and comments regarding their overall outcomes with the study:

H1: Those persons age 65 and older who report having arthritis (P/E) will be significantly more likely to be suffering from MDD than those who have not reported having an arthritic condition (P/E) [results were positive within Models 2-4].

H2: Those persons age 65 and older who report having arthritis (P/E) will be significantly more likely to be suffering from depression (P) than those who have not reported having an arthritic condition (P/E) [results were negative within Models 2-4].

This creates significant concern, given that each of the multivariate models (2-4) examined arthritis (P/E) while utilizing the same control variables throughout. Further, many of the relationally significant variables in the MDD versus depression (P) models were not the same (Table 4.4 /4.5).

5.3 LIMITATIONS OF THE STUDY

There were several limitations to the study which need to be addressed. NESARC was surveyed from 2001-02 so the outcome data are beginning to become dated. The depression (P) variable was recoded to include a dichotomous variable included the following two response options: (1) all of the time/most of the time (2) all other responses. This was done to utilize multiple logistic regression to analyze Models 1-3 in the multivariate model. Some of the selection variables were somewhat limited in response size, given that their subcategories were greater than three. Lastly, the study

was originally intended to be an alcohol and drug survey collection tool so the overall sample population selection and survey questioning and administration could not be reviewed for quality.

5.4 CONCLUSIONS

Those seniors who suffer from arthritis (P/E) were more likely to also suffer from MDD in all models tested. However, those same seniors were not more likely to suffer from arthritis (P/E) in all models (2-4) when analyzing depression (P). Further, the bivariate relationship between MDD and the control variables conclusively expressed differing results within the multivariate analysis than did those expressed between depression (P) and arthritis. This study examined arthritis (P/E) and their comparable relationship to whether the senior suffered from either MDD or depression (P). The results demonstrated conclusive evidence that one cannot count on an elderly patient to have a positive perception of depression as it relates to being positively screened for MDD. Further, it would appear that older persons may not disclose whether or not they are depressed in a clinical environment. This becomes important to clinicians and further demonstrated the need for clinically valid assessment measures to ensure preventative measures are being taken to address elderly depression.

5.5 RECOMMENDATIONS

The variations between the multivariate models (2-4) outcomes and the two dependent variables [MDD and depression (P)] suggest further investigation into dependent variable differences is needed. Primarily, a cross sectional review outlining the differences between MDD and depression (P) and those variables in which stratification could provide some account for demonstrated differences throughout this study.

Gender needs to be further investigated, given its significance in Models 2-4 (all multivariate models) when modeled with MDD. Further, gender was not significant in any of the depression (P) multivariate models. In Model 4, women were significantly more likely to suffer from MDD than men [OR 2.21; 95% CI: (1.74, 2.82)], however, no significance was reported in Model 4 when control variables examined with depression (P) [OR 1.22; 95% CI: (0.95, 1.57)]. The differences between gender and depression for those 65 years old and greater would add clinical value for those practitioners attempting to better understand gerontology and mental health treatment.

The biological relationship between those with MDD and having reported their mother being depressed needs further study. In Model 4, those who reported their biological mother being depressed were significantly more likely to suffer from MDD [OR 3.33; 95% CI: (2.44, 4.55)]. Conversely, in the depression (P) Model 4, someone reporting that their biological mother was depressed were no more likely to perceive themselves as depressed [OR 1.11; 95% CI: (0.68, 1.79)].

Those experiencing financial hardship were significantly more likely to suffer from MDD and to perceive themselves as being depressed. This was significant in all multivariate models when either MDD or depression (P) was the dependent variable being examined.

Another area of future study would be the oldest old (85+) ability to be significantly less likely to be suffering from MDD than the youngest old (65-74) [OR 0.43; 95% CI: (0.29, 0.62)]. This perhaps could lead to the development of coping mechanism techniques in which the oldest old demonstrate or disclose learned behaviors for dealing with medical issues and the aging process.

The final area of recommendation for further study would be concerning a patient's perception with regards to pain and its impact on those who have arthritis. In the MDD study, those who reported pain (all levels) were no more likely to suffer from MDD. However, those who reported pain (all levels) were significantly more likely to self-report being depressed.

REFERENCES

- Agency for Health Research and Quality (AHRQ)*. 2010. Medical Expenditure Survey.
- American Psychiatric Association (APA)*. 1994. *Diagnosis and Mental health Disorders Statistical Manual*, 4th Edition. Washington, DC.
- American Academy of Family Physicians (AAFP)*. 2012. Depression and Bipolar. <http://www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=6>
- American Psychiatric Association (APA)*. 2010. Practice Guideline for the Treatment of Patients With Major Depressive Disorder, Third Edition. Washington, DC: American Psychiatric Association; <http://psychiatryonline.org/content.aspx?bookid=28§ionid=1667485>.
- American Academy of Pediatrics*. 2007. The Joint Principles of Patient Centered – Medical Homes.
- Anderson R. 1995. Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? *Journal of Health and Social Behavior* 36: 1-10.
- Arendt, Hannah. 2009. *The human condition*. Second ed. Chicago: University of Chicago Press.
- Berwick, D. M., Thomas, T. W., & Whittington, T. 2008. The Triple Aim: Care, Health and Cost. *Health Affairs* 27(3):
- Blazer, D. G. 1994. The Prevalence and Distribution of Major Depression in a National Community Sample: The National Comorbidity Survey. *American Journal of Psychiatry*. 151(7), 979-986.
- Blazer, D., Hybels, C. & Pieper, C. 2001. The association of depression and mortality in elderly persons: a case for multiple independent pathways. *Journal of Gerontology: Medical Sciences* 56A; M505–M509.
- Bolen J, Schieb L, Hootman JM, Helmick CG, Theis K, Murphy LB, et al. 2010. Differences in the prevalence and impact of arthritis among racial/ethnic groups in the United States, National Health Interview Survey, 2002, 2003, and 2006. *Prev Chronic* 7(3):A64.

- Boslaugh, Sarah. 2010. Obesity epidemic in culture wars. *Journal of Diseases Caused by Overweight*. Armonk, New York: University Press.
- Brenes, G., et al. 2008. Anxiety, depression, and disability across the lifespan. *Aging and Mental Health*, 12, 158-163.
- Cairney, J., Corna, L. M., Veldhuizen, S., Herrmann, N., & Streiner, D. L. 2008. Comorbid Depression and Anxiety in Later Life: Patterns of Association, Subjective Well-being, and Impairment. *Am J Geriatr Psychiatry*, 16(3), 201-208.
- Centers for Disease Control. 2005. Prevalence and Most Common Causes of Disability Among Adults – United States. *Morbidity and Mortality Weekly Report* 58(16): 421-426.
- Centers for Disease Control. 2010. Stress and depression management. *Morbidity and Mortality Weekly Report* 30: 250-252.
- Centers for Disease Control. National Center for Health Statistics. *Health Data Interactive*.
- Centers for Medicare and Medicaid Services. 2010. *Chronic Conditions Warehouse*.
- Centers for Medicare and Medicaid Services. 2011. *Chronic Conditions Dashboard*.
- Centers for Medicare and Medicaid Services. 2010. *National Health Expenditures Report*.
- Chop, W. 2009. *Gerontology for the Health Care Professional* (2 ed.). New York: Jones & Bartlett Publications.
- Cloninger, R. 2002. Implications of comorbidity for classification of mental disorders. *Journal of Comorbidity and Mental Disorders*. Chichester, England: John Wiley & Sons Inc.
- Davison, T. E., McCabe, M. P., Mellor, D., Ski, C., George, K., & Moore, K. A. 2007. The prevalence and recognition of major depression among low-level aged care residents with and without cognitive impairment. *Aging Ment Health*, 11(1), 82-88.
- Department of Health and Human Services. 2007. *Mental Health Services Substance Abuse and Administration. National Survey on Drug Use and Health*.
- Department of Labor. 1996. Fact Sheet on Mental Health Parity Act (MHPA).
- Department of Labor. 2008. Fact Sheet on Mental Health Parity and Addictions Equity Act (MHPAEA).

- Donohue, J., Zhang, Y., Aiju, M., Perera, S., Lave, J., Hanlon, J., & Reynolds, C. 2011. Impact of medicare part D on antidepressant treatment, medication choice and adherence among older adults with depression. *Am J Geriatr Psychiatry*. 19(12): 989-997.
- Druss B., & Pincus H. 2000. Suicidal ideation and suicide attempts in general medical illnesses. *Arch Intern Med*; 160(10), 1522–1526.
- Dunlop, D. D., Lyons, J. S., Manheim, L. M., Song, J., & Chang, R.W. 2004. *Medical Care*; 42(6): 502-511
- Fava, M., Rankin, M. A., Wright, E. C., Alpert, J. E., Nierenberg, A. A., & Pava, J., et al. 2000. Anxiety disorders in major depression. *Compr Psychiatry*. 41(2): 97-102.
- Flegal K.M., Carroll M.D., Ogden C.I., & Curtin LR. 2010. Prevalence and trends in obesity among US adults, 1999-2008. *JAMA*. 303: 235-41.
- Fuller-Thomson, E., & Shaken, Y. 2009. Factors associated with suicidal ideation among individuals with arthritis and rheumatism: findings from a representative community survey. *Arthritis Care and Research*. 61(7), 944-950.
- Haber, D. H. 2010. *Health Promotion and Aging: Practical Applications for Health Professionals, Fifth Edition* (5 ed.). New York: Springer Publishing Company.
- Hetzel, B. S., & Leeder, S. R. 2001. Half a century of healthcare in Australia. *The Medical Journal of Australia*. 174(1), 21-24.
- Hootman, J. M., & Helmick, C. G. 2006. Projections of US prevalence of arthritis and associated activity limitations. *Arthritis Rheum*. 54, 226-229.
- House, J. S. 2001. Understanding Social Factors and Inequalities in Health: 20th Century Progress and 21st Century Prospects. *Journal of Health and Social Behavior*. 43(6): 125-142.
- Hybels, C. F., & Blazer, D.G. 2003. Epidemiology of late-life mental disorders. *Clinics in Geriatric Medicine*, 19, 663-696.
- Jeste, D. V., Alexopoulos, G. S., Bartels, S. J., Cummings, J. L., Gallo, J. J., Gottlieb, G. L., et al. 1999. Consensus statement on the upcoming crisis in geriatric mental health: Research agenda for the next 2 decades. *Archives of General Psychiatry*, 56, 848-853.
- Julien, R.M., Advokat, C.D., & Comaty, J.E. 2011. A primer of drug action. 12th edition. *Worth Publishers*.

- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., et al. 2003. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association*, 289(23), 3095-3105.
- Kessler, R. C., Berglund, P.A., Demler, O., Jin, R., Merikangas, K.R., & Walters, E.E. 2005. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*, 62, 593-602.
- Kessler, R. C. 2007. The global burden of anxiety and mood disorders: Putting the European Study of the Epidemiology of Mental Disorders (ESEMeD) findings into perspective. *Journal of Clin Psychiatry*, 68[suppl 2: 10-19].
- Kubler-Ross, E., 1969. On Death and Dying, *Routledge*, ISBN 0-415-04015-9.
- Lantz, M. 2002. Depression in the elderly: Recognition and treatment. *Clinical Geriatrics*, 10, 18-24.
- Lawrence, R. C., Helmick, C. G., & Felson, D. T. 2008. Assessments of the prevalence of rheumatic conditions and arthritis in the United States. Part II. *Arthritis Rheum* 58(1):26–35.
- Lecrubier, Y. 2007. Widespread underrecognition and undertreatment of anxiety and mood disorders: result from 3 European studies. *J Clin Psychiatry* 68[suppl 2] 36-41.
- Margaretten, M., Julian, L., Katz, P., & Yelin, E. 2011. Depression in patients with rheumatoid arthritis: description, causes and mechanisms. *Int J Clin Rheumtol*. 6(6): 617–623.
- Maslow, A. H., 1943. A theory of human motivation. *Psychological Review* 50(4): 370-396.
- McClellan M., McKethan A. N., Lewis J. L., Roski J., & Fisher E.S., 2010. A National Strategy to Put Accountable Care Into Practice. 29(5): 982-990.
- Mental Health: A Report of the Surgeon General 1999. *Department of Health and Human Services*.
- Mentally Healthy Aging: A Report on Overcoming Stigma for Older Americans 2005. DHHS Pub. No. (SMA) 05-3988. Rockville, MD: *Center for Mental Health Services, Substance Abuse and Mental Health Services Administration*.
- Messier, S. P. 2005. Weight loss reduces knee-joint loads in overweight and obese older adults with knee osteoarthritis. *Arthritis and Rheumatism* 52(7): 2026-2032.

- Morris, A., Yelin, E. H., Panopalis, P., Julian, L., & Katz, P. P. 2011. Long-term patterns of depression and associations with health and function in a panel study of rheumatoid arthritis. *J Health Psychol.* 16(4), 667-77.
- Murphy, L. M., Sacks, J. J., Brady, T. J., Hootman, J. M. & Chapman, D. P. 2012. Anxiety and depression among US adults with arthritis: prevalence and correlates. *Arthritis Care and Research.* 64(7), 968-976.
- National Epidemiologic Survey on Alcohol and Related Conditions. 2001-2002. *National Institute on Alcohol Abuse and Alcoholism.*
- National Prevention Council. 2011. National Prevention Strategy, Washington, DC: *U.S. Department of Health and Human Services, Office of the Surgeon General.*
- New Freedom Commission on Mental Health. 2003. Achieving the Promise: Transforming Mental Health Care in America. Final Report. DHHS Pub. No. SMA-03-3832. Rockville, MD.
- Nutt, D. J., Kessler, R. C., Alonso, J. Benbow, A., & Lucrubier, Y. 2007. Consensus statement on the benefit to the community on ESEMed survey data on depression and anxiety. *J Clin Psychiatry.* 68[suppl 2]: 42-48.
- A Profile of Older Americans: 2007. 2007. *Administration on Aging: U.S. Department of Health and Human Services.*
- A Profile of Older Americans: 2009. 2009. *Administration on Aging: U.S. Department of Health and Human Services.*
- Radloff, L. S. 1977. The CES-D scale: Journal on a self-report depression scale for research in the general population. *Applied Psychological Measurement* 1: 385-401.
- Report to Congress. 2012. Compliance with the Mental Health Parity and Addiction Equity Act (MHPAEA).
- Report on Mental Illness. 2001. *World Health Organization (WHO).*
- Schneider, K. M., O'Donnell, B. E., & Dean, D. 2009. *Health and Quality of Life Outcomes;* 7(82), 1-11.
- The Societal Promise of Improving Care for Depression. 2004. *RAND Health Corporation.*
- What is Mental Illness: Mental Illness Facts. (2007a). *National Alliance on Mental Illness (NAMI).*

Substance Abuse and Mental Health Services Administration 2002. Report to Congress on the Prevention and Treatment of Co-occurring Substance Abuse Disorders and Mental Disorders. Bethesda, MD: *Substance Abuse and Mental Health Services Administration*.

Theis KA, Murphy L, Hootman JM, Helmick CG, Yelin EH. 2007. Prevalence and correlates of arthritis-attributable work limitation in the U.S. population among persons ages 18--64, 2002 NHIS data. *Arthritis Care Res*, 57:355-63.

Tylee, A., & Walters, P. 2007. Underrecognition of anxiety and mood disorders in primary care: why does the problem exist and what can be done? *J Clin Psychiatry* 68[suppl 2]: 27-30.

U.S. Department of Health and Human Services. 1999. Mental Health: A Report of the Surgeon General. Rockville, MD: *U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health*.

What is Mental Illness: Mental Illness Facts. 2007a. *National Alliance on Mental Illness (NAMI)*.

Williams, J., et al. 2002. Rational clinical examination: Is this patient clinically depressed? *Journal of the American Medical Association*, 287, 1160-1167.

Yelin E, Murphy L, Cisternas M, Foreman A, Pasta D, Helmick C. 2007. Medical care expenditures and earnings losses of persons with arthritis and other rheumatic conditions in 2003 with comparisons to 1997. *Arthritis Rheum*.

REVIEWED

Ahles, T. A., Khan, S. A., Spiegel, D. A., Yunus, M. B., & Masi, A. T. 1991. Main fibromyalgia patients status of psychiatry, DSM-III diagnoses evaluation in rheumatoid arthritis patients. *Am J Psychiatry* 148: 1721-6.

Albert, S. M., & Freedman, V. A. 2009. *Public Health and Aging: Maximizing Function and Well-Being, Second Edition* (2 ed.). New York: Springer Publishing Company.

Aldwin, C. M. 1990. The Elders Life Stress Inventory: Egocentric and nonegocentric stress. M. A. P. Stephens, J. H. Crowther, S. E. Hobfoll, & D. L. Tennenbaum (Eds.), *Stress and coping in later-life families*. New York: *Hemisphere* 49-69.

Armstrong, C. L., & Morrow, L. 2010. *Handbook of medical neuropsychology: Applications of cognitive neuroscience*. New York: *Springer Publications*.

Arthritis at a Glance. 2010. *National Center for Chronic Disease Prevention and Health Promotion: Centers for Disease Control and Prevention*.

- Benjamin, Lorna. 2005. *Interpersonal diagnosis and treatment of personality disorders*. New York: Guilford.
- Berkman, L., Berkman, C., Kasl, S., Freeman, D., Leo, L., Ostfeld, A., Cornoni-Huntley, J. & Brody, J. 1986. Depressive symptoms in relation to physical health and functioning in the elderly. *American Journal of Epidemiology*. 124, 372–388.
- Bishop, B., Cantor, S., Green, A., & Torresin, W. 1987. Depression, anxiety and rheumatoid arthritis (RA) activity. *Clin. Exp Rheumatol*. 5: 147-150.
- Bleuler, Eugen. 2007. *The theory of schizophrenic negativism*. Trans. W. White. Nervous and Mental Disease Monograph Series 11. New York: Journal of Nervous and Mental Disease Publishing Company. (Orig. pub. 1910.)
- Bridges, Patricia S. 2007. *Prehistoric arthritis in the Americas: Annual review of anthropology*. Geneva, Switzerland: Prentice Hall.
- Bruce, M. L., Ten Have, T. R., Reynolds, C. F. III, et al. 2004. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients. *JAMA*; 291, 1081-1091.
- Bruce, T. 2008. Comorbid depression and Rheumatoid arthritis : medical and pathophysiology implications. *Curr Psychiatry*, 32:10(3):258-264.
- Buck, J.A. & Umland, B. 1997. Covering Substance and Mental Health Abuse. *Health Affairs (Millwood)*, 16, 120-126.
- Burton, A. M., Haley, W. E., & Small, B. J. 2006. Bereavement after caregiving or unexpected death: effects on elderly spouses. *Aging Ment Health*, 10(3), 319-326.
- Cannon, D. S., Tiffany, S. T., Coon, H., Scholand, M. B., McMahon, W. M., & Leppert, M. F. 2007. The PHQ-9 as a brief assessment of lifetime major depression. *Psychol Assess*, 19(2), 247-251.
- Charney, D. S., Reynolds, C. F., Lewis, L., et al. 2003. Depression and bipolar support alliance consensus statement on the unmet needs in diagnosis and treatment of mood disorders in late life. *Arch Gen Psych*; 60.
- Chen, Y. F., Barton, P., & Jobanputra, P. 2008. discerning non-steroidal cyclooxygenase-2, anti-inflammatory arthritis medication . Economic evaluation A systemic review. *Health Assess* 12: 1-278.
- Cheng, Y. J., Murphy, L. B., Hootman, J. M., Helmick, C. G., & Langmaid, A. G. 2010. Doctor-diagnosed arthritis prevalence and activity restriction attributed to arthritis United States, 2007–2009. *MMWR* 2010;59(39):1261–1265.

- Choy E.H., Smith C. Dore CJ. Scott D I. 2005. An efficacy meta- analysis and toxicity of combining disease modifying antirheumatic drugs in rheumatoid arthritis based on withdrawal. *Rheumatology (oxford)* 44: 1414-21.
- Christie, A., Dahm K. T., Jamtvedt, G., & Hagen, K. B. 2007. Nonpharmacological effectiveness and non-surgical interventions effectiveness for patients with rheumatoid arthritis. *Phys Ther* 87: 1697-715.
- Clarkson, J. 2008. Delays in notification of infectious disease. *Journal of Health Trends*. 19, 9-11.
- Cohen, S. 2008. Psychological stress and susceptibility to the common cold. *Journal on Medicine*. 325: 606-612.
- Comer, R. J. 2001. Abnormal psychology (4th Ed.). *New York: Worth Publishers*.
- Connidis, I. A. 2001. Family ties and aging. *Thousand Oaks, CA: Sage*.
- Constance & Hammen. 2005. Stress and Depression. *Annu. Rev. Clin. Psychol.* 1: 293-319.
- Costenbader, K. H., Puett, R., Laden, F., Chang, S. c., & Karlson, E. W. 2008. Geographic disparity in RA incidence among United States women. *Arch Intern Med* 2008 168: 1664-70.
- Devins, G.M., Edworthy, S. M., Guthrie, N. G., & Martin, L. 1992. Insensitivity of illness in Rheumatoid arthritis: depression differential impact over adult lifespan. *J. Rheumatol* 19: 7099-715.
- Dominick, K. L., Ahern, F. M., Gold, C. H., & Heller, D. A. 2004. Health-related quality of life among older adults with arthritis. Health Qual Life Outcomes, 2:5.*
- Driscoll, H. C., Basinski, J., Mulsant, B. H., Butters, M. A., Dew, M. A., Houck, P. R., et al. 2005. Late-onset major depression: clinical and treatment-response variability. *Int J Geriatr Psychiatry*, 20(7), 661-667.
- Dunlop, D. D., Song, J., Manheim, L. M., Yelin, E. H., & Chang, R.W. 2003. The arthritis costs. *Arthritis Rheum*; 49:101-13.
- Elandt, J. 2008. Definition of significant terms in arthritis.
- Ettinger, W. 2005. Health educational program in older adults with knee osteoarthritis. *The Journal of the American Medical Association*. 277: 25-45.
- Feinstein, R. 1970. The pre-therapeutic classification of co-morbidity in chronic disease. *Journal of Chronic Diseases*. 23 (7): 455-468.

- Frank, R. G., Parker, J. C., Beck, N. C., Elliott, T.R., Kashani, J. H., Haut AE, & Smith, E. 1988. Rheumatoid arthritis and depression. *J Rheumatol.* 15: 920–5.
- Frayne, S. M., Miller, D. R., Sharkansky, E. J., Jackson, V. W., Wang, F., Halanych, J. H., et al. 2010. Using administrative data to identify mental illness: What approach is best? *American Journal of Medical Quality*, 25(1): 42-50.
- Friedman, B., Jiang, J. H., Elixhauser, A., Segal, A. 2006. Hospital Inpatient Costs for Adults with Multiple Chronic Conditions . *Medical Care Research and Review.* 63(3), 327-346.
- Furner, S.E., Hootman, J.M., Helmick, C.G., Bolen, J., & Zack, M.M. 2011. Health-related quality of life of US adults with arthritis: analysis of data from the behavioral risk factor surveillance system, 2003, 2005, and 2007. *Arthritis Care Res. (Hoboken).* 63(6), 788–799.
- George, L. K. 2001. Life events. In G. L. Maddox (Ed.), *The encyclopedia of aging* (Vol. 2, 3rd ed., pp. 596-598). New York: Springer.
- Glesecke, J. 2005. The long-term prognosis of acute depression. *European Heart* 8: 251-253.
- Gloaguen, V., Cucherat, M., Blackburn, I., & Cottraux, J. 1998. A meta-analysis of the effects of cognitive therapy in depressed patients. *J Affect Disord.* 49:59–72.
- Harrold, L. R., Li, W., Yood, R. A., Fuller, J., & Gurwitz, J. H. 2008. Identification of patients with arthritis and arthritis-related functional limitation using administrative data. *Journal of Public Health Management and Practice : JPHMP*, 14(5), 487-497.
- Helmick, C. G., Lloyd, E., Pollard, R. A., Lawrence, R. C., & Heyse, S. P. 1995. Other rheumatic conditions and arthritis who will be affected later? *Arthritis Care Res.* 8:203–11.
- Himes, C. L. 2001. Elderly Americans. *Population Bulletin*, 56(4).
- Hurwicz, M. L., & Berkanovic, E. 1993. Rheumatoid arthritis stress process. *J Rheumatol.* 20: 1836–44.
- Jeste, D. V., Blazer, D. G., & First, M. 2005. Aging-related diagnostic variations: need for diagnostic criteria appropriate for elderly psychiatric patients. *Biol Psychiatry*, 58(4), 265-271.
- Jongenelis, K., Pot, A. M., Eisses, A. M., Beekman, A. T., Kluitert, H., & Ribbe, M. W. (2004). Prevalence and risk indicators of depression in elderly nursing home patients: the AGED study. *J Affect Disord*, 83(2-3), 135-142.

- Jordan, K., Clarke, A. M., & Symmons, D. P. 2007. Disease prevalence measurement. musculoskeletal disease comparison using four practice consultation databases. *Br. J Gen Pract* 57 7-14.
- Joyce, A.T., Smith, P., Khandker R., Melin, J.M., & Singh, A. 2009. Hidden cost of rheumatoid arthritis (RA), estimating cost of comorbid cardiovascular disease and depression among patients with RA. *J. Rheumatol.* 36(4), 743–752.
- Kadam, U. T., Croft, P. R., & Jordan, K. 2004. Clinical comorbidity in osteoarthritis: a case- general practice control study of consultants in Wales and England. *Ann Rheum Dis.* 63, 408–14.
- Katon, W. J., Von Korff, M., Lin, E., Simon, G., Walker, E., Unutzer, J. et al. 1999. Stepped collaborative care for primary care patients with persistent symptoms of depression: A randomized trial. *Archives of General Psychiatry.* 56, 1109-1115.
- Katon, W. J., Roy-Byrne, P., Russo, J., & Cowley, D. 2002. Cost-effectiveness and cost offset of a collaborative care intervention for primary care patients with panic disorder. *Archives of General Psychiatry.* 59, 1098-1104.
- Katon, W. J. 2003. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry.* 54(3), 216-226.
- Katz, P. P., & Yelin, E. H. 1995. The development of depressive symptoms among women with rheumatoid arthritis. *Arthr. Rheum.* 38: 49-56.
- Keefe, F. & Bonk, V. 1999. Psychological assessment of pain in patients having rheumatic diseases. *Rheumatic Disease Clinics of North America.* 25: 81-103.
- Kessler, R. C. 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry* 51 (1): 8-19.
- Kriegsman, D. M., Deeg, D. J., & Stalman, W. A. 2004. Somatic chronic diseases Comorbidity and physical functioning decline. *The Study Longitudinal Aging Amsterdam. J Clin Epidemiol;*57:55–65.
- Levenstein, Harvey. 2003. *The transformation of the American diet.* Berkeley and Los Angeles: University of California Press.
- Lee, D. W., Meyer, J. W, Clouse, J. 2001. Implications of controlling for comorbid conditions in cost-of-illness estimates: a case study of osteoarthritis from a managed care system perspective. *Value Health* 4:329–34.
- Li, X., Gignac, M.A., & Anis, A.H. 2006. The indirect costs of arthritis resulting from unemployment, reduced performance, and occupational changes while at work.

Med. Care. 44(4), 304–310.

Lin H. B., Von Korff, M., & Katon, W. 2003. Effects depression care improvement on pain and functional outcomes among patient elderly adults suffering with arthritis: a randomized controlled trial . *Journal of the American Medical Association.* 290(18) 2428-9.

Losina E., et. al. 2003. Accuracy of Medicare claims data for rheumatologic diagnoses in total hip replacement recipients, *Journal of Clinical Epidemiology*, 56(6):515-9.

Lazarus, R. S., & DeLongis, A. 1983. Psychological stress and coping with aging. *American Psychologist*, 38, 245-254.

Lowe, B., Unutzer, J., Callahan, C. M., Perkins, A. J., & Kroenke, K. (2004). Monitoring depression treatment outcomes with the patient health questionnaire-9. *Med Care*, 42(12), 1194-1201.

Lyne, K. J., Moxon, S., Sinclair, I., Young, P., Kirk, C., & Ellison, S. 2006. Analysis of a care planning intervention for reducing depression in older people in residential care. *Aging Ment Health*, 10(4), 394-403.

Manne, S. L., & Zautra, A. J. 1992. Coping with arthritis. *Arthr. Rheum* 35: 1273-1280.

Margaretten, M., Yelin, E., Imboden, J., et al. 2009. Predictors of depression in a multiethnic cohort of patients with rheumatoid arthritis. *Arthritis Rheum.* 61(11); 1586–1591.

Lazarus, R. S., & DeLongis, A. 1983. Psychological stress and coping with aging. *American Psychologist*, 38, 245-254.

Lowe, B., Unutzer, J., Callahan, C. M., Perkins, A. J., & Kroenke, K. (2004). Monitoring depression treatment outcomes with the patient health questionnaire-9. *Med Care*, 42(12), 1194-1201.

Lyne, K. J., Moxon, S., Sinclair, I., Young, P., Kirk, C., & Ellison, S. 2006. Analysis of a care planning intervention for reducing depression in older people in residential care. *Aging Ment Health*, 10(4), 394-403.

Manne, S. L., & Zautra, A. J. 1992. Coping with arthritis. *Arthr. Rheum* 35: 1273-1280.

Margaretten, M., Yelin, E., Imboden, J., et al. 2009. Predictors of depression in a multiethnic cohort of patients with rheumatoid arthritis. *Arthritis Rheum.* 61(11); 1586–1591.

Mauk, L. 2006. Gerontological nursing competencies for care. *Sudbury, MA: Jones & Bartlett.*

- Muchmore L, Lynch, W. D., Gardner, H. H., Williamson, T., & Burke, T. 2003. Prevalence of associated joint disorders arthritis and in an employed population and the associated sick leave, healthcare, disability, and workers' compensation benefits cost productivity loss of employers. *J Occup Environ Med* 45:369–78.
- Murphy, L., Helmick, C. G., Bolen, J., & Brady, T. J. 2009. Comorbidities Are Very Common Among People With Arthritis. *Poster 43*. CDC.
- Nakar, S. 2003. Can you smell the stress? *The Lancet* 343: 729-730.
- National Committee for Quality Assurance. 1999. HEDIS 1999 technical specifications: Volume 2. Washington D.C. *National Committee for Quality Assurance*.
- Pinto-Meza, A., Serrano-Blanco, A., Penarrubia, M. T., Blanco, E., & Haro, J. M. 2005. Assessing depression in primary care with the PHQ-9: can it be carried out over the telephone? *J Gen Intern Med*, 20(8), 738-742.
- Pochard, F., Darmon, M., Fassier, T., Bollaert, P. E., Cheval, C., Coloigner, M., et al. 2005. Symptoms of anxiety and depression in family members of intensive care unit patients before discharge or death. A prospective multicenter study. *J Crit Care*, 20(1), 90-96.
- Post, RM, Rubinow DR, Ballenger JC. 1984. Conditioning, sensitization, and kindling: implications for the course of affective illness. *Neurobiology of Mood Disorders*. Baltimore, MD: Williams & Wilkins. 432–56.
- Post, RM. 1992. Transduction of psychosocial stress into the neurobiology of recurrent affective disorder. *Am.J.Psychiatry*. 149: 999–1010.
- Population Reference Bureau. 2000. 2000 United States population data sheet. Washington, DC: Author.
- Probst, J. C., Laditka, S. B., Moore, C. G., Harun, N., Powell, M. P., & Baxley, E. G. 2006. Rural-urban differences in depression prevalence: implications for family medicine. *Fam Med*, 38(9), 653-660.
- Regier, D. A., Burke, J. D., Boyd, J. H., Kramer, M., Rae, D. S., Myers, J. K., & Robins, L. N. 1988. One month mental disorders prevalence in the United States. *Gen Arch Psychiatry* 45: 977–86.
- Rapoport, M. J., Kiss, A., & Feinstein, A. (2006). The impact of major depression on outcome following mild-to-moderate traumatic brain injury in older adults. *J Affect Disord*, 92(2-3), 273-276.
- Reynolds, C. F., 3rd, Dew, M. A., Pollock, B. G., Mulsant, B. H., Frank, E., Miller, M. D., et al. 2006. Maintenance treatment of major depression in old age. *N Engl J*

Med, 354(11), 1130-1138.

- Robins, L. N., Wing, J., Wittchen, Helzer, J. E., H. U., Babor, T. F., Pickens, R., & Regier, D. A. 1988. The International Composite Diagnostic Interview: an instrument suitable for epidemiologic use in conjunction with different cultures different diagnostic systems *Arch Gen Psychiatry* 45:1069-77.
- Roose, S. P. & Sackeim, H. A. 2004. Late Life Depression. *Oxford University Press*. ISBN: 9780195152746.
- Saag, K. G., Patkar, N. M., & Teng, G. 2008. Recommendations for the use non biologic and biologic disease modifying antirheumatic drugs in rheumatoid arthritis. *Arthritis Rheum* 59: 762-84.
- Schaider, Jeffrey. 2009. Harwood-Nuss' clinical practice of emergency medicine. Philadelphia: *Lippincott*, 740.
- Schoenbaum, M., Unutzer, J., Sherbourne, C., Duan, N., Rubenstein, L. V., Miranda, J., et al. 2001. Cost-effectiveness of practice-initiated quality improvement for depression: results of a randomized controlled trial. *JAMA*, 286(11), 1325-1330.
- Scholes, F. 2011. Americans' heritage and features. *Applied Geographical Institute* 49 (4): 831-834.
- Schulz, R., Beach, S. R., Lind, B., Martire, L. M., Zdaniuk, B., Hirsch, C., et al. 2001. Involvement in caregiving and adjustment to death of a spouse: findings from the caregiver health effects study. *JAMA*; 285(24), 3123-3129.
- Scott, J. C., & Hochberg, M. C. 1998. Musculoskeletal diseases and arthritis. Chronic disease epidemiology and control, 2nd ed. Washington. Dc. *American Public Health Association* 468-70.
- Sharp, L. K. and M. S. Lipsky. 2002. Screening for depression across the lifespan: A review of measures for use in primary care settings. *American Family Physician* 66 (6): 1001-1008.
- Slade, G. and C. Isakidis. 2002. Deconstructing current comorbidity: Australia national survey. *British Journal of Psychiatry* 181: 306-312.
- Smith, Andrew F. 2004. *The Oxford encyclopedia of food and drink in America*. Oxford: Oxford University Press.
- Spettell, C. M., Wall, T. C., Allison, J., Calhoun, J., Kobyliski, R., Fargason, R., et al. 2003. Identifying physician-recognized depression from administrative data: Consequences for quality measurement. *Health Services Research*, 38(4), 1081-1102.

- Stembridge, J. E. 2010. America's demographics, sex, age, and culture. *Journal of Onset of Depression Symptoms in Older Adults* 34 (23): 12-78.
- Steffens, D. C. 2000. Prevalence of Depression and Its Treatment in an Elderly Population. *Arch Gen Psychiatry*, 57, 601-607.
- Stevens, A. 2004. Health care needs assessment: The epidemiologically based needs assessment reviews. *Oxford: Radcliffe Publications*.
- Symmons, D., & Turner, G. 2002. Rheumatoid arthritis prevalence in the United Kingdom. New estimates for a new century. *Rheumatology (Oxford)* 41: 793-800.
- Unutzer, J., Katon, W., Callahan, C. M., Williams, J. W., Jr., Hunkeler, E., & Harpole, L. et al. 2002. Collaborative care management of late-life depression in primary care setting: A randomized controlled trial. *Journal of American Medical Association*, 288: 2836-2845.
- Van Der, D., Houwing- Duistermaat, J. J., & Toes, R. E. 2009. Quantitative heritability of anti-citrullinated protein antibody negative protein anti-citullinated antibody positive and rheumatoid arthritis. *Arthritis Rheum*, 60: 916-23.
- Williamson, G. M., & Dooley, W. K. 2001. Aging and coping: The activity solution. In C.R. Snyder (Ed.), *Coping with stress: Effective people and processes*. *Oxford: Oxford University Press* 240-258.
- Wilson, A., Y, H. T., Goodnough, L. T., & Nissenson, A. R. 2004. Outcomes and prevalence of anemia in RA: a literature systematic review . *Am J Med* 116(suppl 7A): 505-7
- Wollenhaupt, J. 2008. Undifferentiated arthritis and reactive arthritis. *Journal of Current Opinion in Rheumatology* 10: 306-313.
- Wolfe, F., & Michaud, K. 2004. Worse outcomes, Severe (RA) rheumatoid arthritis, sociodemographic and comorbid illness, disadvantages of RA patients suffering fibromyalgia. *J Rheumatol*, 31:695-700.
- Wolfe, F., Michaud, K., 2009. Predicting depression in rheumatoid arthritis: the signal importance of pain extent and fatigue, and comorbidity. *Arthritis Rheum*; 61(5), 667-673.
- Zung, William W. K. 1965. A self-rating depression scale. *Archives of General Psychiatry* 12 (1): 63-70.