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Philadelphia College of Osteopathic Medicine

Department of Psychology

DOES THE QUALITY OF THE PATIENT-PHYSICIAN RELATIONSHIP  
MODERATE PREDICTORS OF POOR ADHERENCE IN URBAN, UNDERSERVED  
AND VULNERABLE PATIENTS WITH CHRONIC ILLNESS?

By Laura Russo-Innamorato

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

September 2011

**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE  
DEPARTMENT OF PSYCHOLOGY**

**Dissertation Approval**

This is to certify that the thesis presented to us by Laura Russo - Innamorato  
on the 17<sup>th</sup> day of May, 2011, in partial fulfillment of the  
requirements for the degree of Doctor of Psychology, has been examined and is  
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# THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

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vulnerable individuals, and for providing me with a strong example of balancing family life with professional and academic achievement. I am grateful for their wisdom and support and hope I have passed this legacy on to my children.

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## Abstract

Escalating prevalence rates and rising economic costs of chronic illnesses necessitate a better understanding of factors affecting patient adherence in the primary care setting. Despite technological advances and evidenced-based treatments, clinical outcomes are often poor. Data drawn from archival data of the “A Healthier You” wellness program designed to serve a predominately underserved population were examined to assess whether or not positive predictors of adherence could moderate the impact of negative predictors such as depression. Limitations of the study methodology precluded significant interpretations but suggested significant discrepancies between patient and physician perceptions of trust in the relationship and the satisfaction with medical services. Results supported trust and satisfaction as essential components of the patient-physician relationship construct.

*Keywords:* patient-physician relationship, trust, satisfaction, depression, adherence

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## Chapter One: Introduction

The impact of chronic illnesses, such as heart disease, obesity, asthma and diabetes, is enormous. For example, cardiovascular conditions are leading causes of disability and the single largest cause of death for both American men and women (American Heart Association, 2006). Health conditions related to obesity and overweight ([BMI] 25 to 29.9 kg/m<sup>2</sup>) are the second leading cause of preventable death in the United States (National Heart, Lung and Blood Institute [NHLBI], 1998). Thirty-one million Americans suffer with asthma, resulting in 450,000 hospital admissions, 4700 deaths, 14 million missed school days (Braman, 2006; Weiss & Sullivan, 2001). An estimated 9.3 % of the U. S. adult population has diabetes (Cowie et al. 2006) and uncontrolled diabetes can lead to range of serious long term complications, including, hypertension, heart disease, and organ damage (Gilmer, O'Connor, Manning, & Rush, 1997).

Further, the economic costs of chronic illnesses make up a large percentage of overall government spending. Approximately 75% of the \$2.2 trillion dollars that the U.S. spends on healthcare goes towards treating chronic conditions (Paez, Zhao, & Hwang, 2009). For cardiovascular disease alone, projected expenditures of health and lost productivity are estimated over \$475 billion dollars for 2009 (AHA, 2009). Estimates of obesity-related costs exceed \$78 billion per year, constituting almost 10% of all health-care dollars spent in the U.S. (Finkelstein, Fiebelkorn, & Wang, 2003), and estimated costs due to asthma are \$11 billion dollars annually (Weiss & Sullivan, 2001; Braman, 2006). Increased absenteeism, disability, and decreased productivity are a few of the acknowledged consequences for patients with chronic illnesses in the workforce (Stewart, Ricci, Chee, Hahn, & Morganstein, 2003). Also a matter of great importance is

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the fact that these costs do not take into account the economic factors related to caregivers, a less studied problem of significant proportion. Estimates of the economic burden resulting from extra hours of informal caregiving for patients with advanced lung disease are estimated at \$1.8 to \$3.5 billion dollars per year (Langa et al. 2002).

Moreover, as prevalence rates for chronic diseases rise, the health and economic burden will rise as well. More than 71 million American adults currently have one or more types of cardiovascular disease (CVD); this number will increase as the number of adults over age sixty-five increases (National Health and Nutrition Examination Survey [NHANES 1999-2002], CDC). Obesity (body mass index ([BMI]  $\geq 30$  kg/m<sup>2</sup>) is now considered a global epidemic; nearly two-thirds of U. S. adults are classified as overweight and one-third as obese (World Health Organization [WHO], 1998; Flegal, Carroll, Ogden & Johnson, 2002). In addition, approximately 300 million people currently have asthma, with estimates suggesting global prevalence rates will increase by 50% every decade (Masoli, Fabian, Holt, & Beasley, 2004).

### Statement of the Problem

Despite technological advances and evidenced-based treatments, clinical outcomes are often poor. One factor influencing outcome is adherence. Research clearly demonstrates that adherence problems are observed in all situations in which patients are required to self-administer treatment protocols, regardless of type or severity of disease, or access to healthcare (World Health Organization [WHO], 2003). Rates of nonadherence to medical regimes for chronic illnesses are approximately 40-60% both in adults and in children (Cleemput, Kesteloot & DeGeest, 2002). For example, less than 2% of adults with diabetes follow the full level of care recommended by the American

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Diabetes Association (Beckles, et al., 1998); only forty-three percent of asthma patients take daily medications as prescribed, and even fewer report using preventative medications as recommended (Reid, Abramson, Raven & Walters, 2000). Research has unequivocally demonstrated that poor adherence is a chief reason for less than optimal clinical results (Dunbar-Jacob, Burke, & Puczynski, 2000; Rybacki, 2002), with adherence being even more strongly related to outcomes of chronic diseases (Di Matteo, Giordani, Lepper & Croghan, 2002; Paterson et al. 2000).

One factor influencing adherence is the patient-physician relationship. It has been established that the patient-physician relationship affects outcomes of medical encounters (Bell, Kravitz, Thom Krupat, & Azari, 2002; Levinson, Gorawara-Bhat, & Lamb, 2000; Thom, & Campbell, 1997), and that a good patient-physician relationship may improve adherence (Rose, Kim, Dennison, & Hill, 2000). A better quality patient-physician relationship is associated with greater adherence in chronically ill patient groups (DiMatteo, 1994; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004) and with better identification of symptoms, such as pain and fatigue, by the physician (Detmar, Muller, Schornagel, Wever, & Aronson, 2002). The construct “relationship”, including the characteristics that define it, is not consistently defined in the literature. Aspects of the patient-physician relationship thought to contribute to relationship quality range from the beliefs, attitudes and behavior of the clinician to the expectation, participation and reaction of the patient (Potter & McKinlay, 2005).

A growing body of research has focused on the concept of trust in one’s physician as an important way of assessing the patient-physician relationship (Rawaf & Kressin, 2007). Research suggests that a patient’s trust in his/her physician is associated with



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continuity of care, self-reported adherence to medication, to satisfaction and to improved health (Hall et al. 2002; Safran, Montgomery, Chang, Murphy & Rogers, 2001). Trust in one's physician is also positively correlated with acceptance of new medications (Mostashari, Riley, Selwyn, & Altice, 1998), satisfaction (Hall et al. 2002), perceived effectiveness of care (Safran, Montgomery, Chang, Murphy, & Rogers, 2001), and improvements in self-reported health status (Safran et al. 1998).

The patient's perspective on the quality of medical care ("patient satisfaction") is another important focus of assessment (Salisbury et al. 2005) and has been associated with level of adherence. For example, higher levels of satisfaction with the patient-physician relationship have been related to adherence to HIV medication (Martini et al. 2002). Further, the concepts of trust in one's physician and satisfaction with health care services are intertwined; a patient's trust in his or her physician predicts patient satisfaction (Baker, Mainous, Gray & Love, 2003). Researchers hypothesize that the quality of the patient-physician relationship and the capability of the health care system to satisfy the health care needs of the individual may determine patients' trust and thus impact medication adherence (Mechanic & Schlesinger, 1996; Westin, Ahs, Persson, & Westerling, 2004).

### *Depression*

Research demonstrates that a higher level of trust, satisfaction and better quality of the patient-physician relationship is associated with better adherence; however, depression and certain coping styles have been associated with poorer adherence. There are abundant studies documenting the impact of psychological disorders such as depression on overall regimen adherence (e.g. Piette, Richardson, & Valenstein, 2004;

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Ciechanowski, Katon, Russo, & Hirsh, 2003; Ciechanowski, Katon, & Russo, 2000).

Patients with significant depressive symptoms have more than twice the risk of underuse of medications compared with those without symptoms of depression (Piette, Heisler, Krein, & Kerr, 2005); and depression is associated with self-report of medication nonadherence in outpatient CHD patients (Gehi, Haas, Pipkin, & Whooley, 2005).

Depression and depressive symptoms negatively affect adherence to recommendations for post myocardial-infarction therapy, completion rates and clinical outcomes in cardiac rehabilitation (Caulin-Glaser, Maciejewski, Snow, LaLonde, & Mazure, 2007). A growing body of research has also begun to identify how factors like depression may interact with a genetic disposition to engage in risk behaviors such as smoking (Lerman et al. 1999).

### *Oppositional Coping Style*

A patient's coping styles has also been shown to influence adherence. Patients often habitually approach and cope with life experiences in pervasive ways; these automatic ways of handling both everyday hassles and major life stressors (such as illness) provide important information about how well a patient may follow a treatment plan (Cruess, Minor, Antoni, & Millon, 2007). Individuals who typically endorse items such as "When people are bossy, I usually do the opposite of what they want" and "I often resent doing things that others expect of me" are more likely than other medical patients to, for example, overmedicate or undermedicate without consulting their health care providers (Millon Antoni, Millon, Meagher, Grossman, 2001). These responses characterize an *oppositional coping style* (Millon et al. 2001). Although previous research has shown that patients with an oppositional coping style are likely to be more

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erratic in following treatment recommendations, it is unclear whether or not the quality of the patient-physician relationship can moderate the association between an oppositional coping style and adherence.

### *Problematic Compliance*

Research has also identified behavioral and attitudinal characteristics that may complicate treatment efficacy. Individuals who respond negatively to questionnaire items such as “I make sure that I’m on time for all of my doctor’s appointments” and “I would change my lifestyle on my doctor’s advice” are more likely to inadvertently or intentionally resist following medical recommendations (Millon et al. 2001). Although previous research has shown that patients with these tendencies may be less likely to keep appointments and follow healthcare guidelines such as dietary advice (Millon et al. 2001), it is unclear whether or not a more highly rated patient-physician relationship can moderate the relationship between the patient characteristics associated with *problematic compliance* and adherence.

### Purpose of the Study

As already noted, previous research has demonstrated a positive association between the perception of a higher quality of the patient-physician relationship and medical adherence. It has also established the fact that *depression*, an *oppositional coping style*, and patients fitting the *problematic compliance* profile predict non-adherence. Whether or not the quality of the patient-physician relationship can moderate the impact that these negative predictors have on adherence, however, remains unknown. The present study therefore seeks to answer this question and address this gap in the literature.

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Drawing from data obtained in a larger study, the present study will assess the patient's perception of trust with his/her primary care physician and level of satisfaction with medical services by analysis of patient responses to self-report questions; these two factors (*trust* and *satisfaction*) will compose the construct of the *relationship*. The patient's perception of his/her level of adherence will be quantified by analysis of patient responses to questions about keeping appointments, filling prescriptions and obtaining diagnostic tests. It will be hypothesized that patients whose profiles fall within higher ranges of *depression*, an *oppositional coping style* and *problematic compliance* will be hypothesized to have poorer adherence. It is proposed that patients who have a higher rated quality of relationships with their primary care physicians will demonstrate higher adherence than patients found to possess the same level of these characteristics (*depression*, *oppositional coping style* and *problematic compliance*) and a lower quality of relationships with their physicians.

Exploratory hypotheses will also seek to incorporate the physician's perspective, because there has been less research to examine this important variable. Patients of less satisfied physicians have been shown to receive lower quality of care (Devoe, Fryer, Hargraves, Phillips, Green, 2002) and have been less satisfied with treatment (Haas, Cook, Puopolo, Burstin, Cleary & Brennan, 2000). Physicians who are less satisfied are also 2-3 times more likely to retire or reduce their hours (Landon, Reschovsky, Pham, & Blumenthal, 2006). Suggested consequences from physician turnover include increased costs to recruit and train new physicians, more dissatisfaction among patients, and impaired morale in the health care organization (Misra-Hebert, Kay & Stoller, 2004).

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Specifically, exploratory hypotheses will examine the association between the physician's level of satisfaction in the relationship and adherence.

More recently, focusing on the symmetry of the patient and physician's perspective as the unit of analysis has gained momentum (Krupat, 2006). Therefore, this study will also examine the correlation between the patient's and physician's perceptions of satisfaction and trust and its association with patient-reported adherence levels. Specifically, it seeks to examine whether or not the physician can accurately assess the patient's level of satisfaction, and whether or not better symmetry on this variable predicts better adherence. Last, the amount of trust reported by the patient and the physician, the level of adherence reported by patient and physician, and whether or not the symmetry, or patient-physician concordance on these variables predict better adherence will be explored.

### Relevance to Cognitive-Behavioral Therapy

The relevance of this study and its objectives to cognitive-behavior therapy is fivefold. First, if the data confirm that patient-centered factors such as depression, coping styles, and specific beliefs and behavioral patterns predict non-adherence to medical recommendations, this will underscore the importance of assessing these variables at the primary care level. Research has substantiated the prevalence (and misdiagnosis) of depression in the primary care setting. The prevalence rate of depression alone has been estimated to be 25% in the primary care setting (Brantley, Mehan, & Thomas, 2000), yet only 50% of patients with depression or anxiety are accurately diagnosed in this setting (Edlund, Unutzer, & Wells, 2004). Psychologists working in the primary care setting are uniquely trained to identify and treat psychosocial factors such as depression influencing

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the course of chronic illnesses such as depression (Butler, Chapman, Forman & Beck, 2006).

Second, mounting evidence suggests that cognitive-behavioral treatment (CBT) successfully targets the psychosocial factors that impact both physiological functioning and health outcomes in patients with chronic illnesses. For example, CBT has been used effectively to reduce hostility and blood pressure in CVD patients (Gidron, Davidson & Bata, 1999), to decrease blood pressure in patients who are not on medication (Kauffman et al., 1998) and to decrease sympathetic arousal (Cottier, Shapiro, & Julius, 1984); important findings such as these physiological changes can lead to tachycardia and ventricular fibrillation (Lampert et al. 2002). Cognitive-behavioral treatment has already been demonstrated to have direct and positive health effects on chronic illnesses, including insomnia (Edinger, Wohlgemuth, Radtke, Marsh, & Quillian, 2001) and chronic pain (Kabat-Zinn, Lipworth, & Burney, 1985; Turk, Swanson & Tunks, 2008).

Third, if the data demonstrate that a better quality of the relationship can moderate the impact of negative predictors of adherence, psychologists are uniquely trained to provide the education and the interventions necessary to improve these relationships. For example, there is evidence that primary care physicians have difficulty developing key relationship skills such as empathy (Maguire, Fairbairn, & Fletcher, 1986); they respond to empathic opportunities very infrequently, and commonly respond to affect or the potential for affect with avoidance, leaving patients feeling misunderstood and uncared for (Suchman, Markakis, Beckman & Frankel, 1997). Cognitive behavioral treatment to improve stress and to develop coping and interpersonal skills has been shown successful

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in reducing obstacles to the patient-physician relationship in medical students (Campo et al. 2008).

Fourth, this study seeks to broaden an understanding of issues specific to underserved populations by drawing its data from patients of healthcare centers from a geographic region with a significant population of ethnic and racial minorities of lower socio-economic status. This focus is critical, considering the fact that minorities share a disproportionate burden of chronic illness in the United States. Morbidity and mortality rates are higher among racial and ethnic minorities than they are among Whites for heart disease, cancer, diabetes and stroke (NHLBI, 2007), and national population-based surveys point out that considerable disparities exist in risk factors prevalence and overall quality of life among non-White U.S. adults (Mensah, Mokdad, Ford, Greenlund, & Croft, 2005).

Last, this research contributes to the scientific understanding of the interaction between the patient and his/her environment and its impact on adherence, adding to the knowledge of factors consistent with the biopsychosocial model. The “biopsychosocial” model (Engel, 1977), represents an important shift from one that treats patients as objects to one that accepts their subjective experiences as important to scientific study. This approach connects the biological, psychological, interpersonal and social factors into a larger framework of multiple interactive systems which are continuous and reciprocal (Tovian, 2006). Psychologists are in a position to work collaboratively with primary care staff to increase the use of the biopsychosocial approach through education (Biderman, Yeheskel, & Herman, 2005). Despite a 2004 report from the Institute of Medicine (IOM) calling for greater training on biopsychosocial factors influencing disease and illness

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(Cuff & Vanselow, 2004), only a minority of physicians currently employ the biopsychosocial model in their practice (Astin, Sierpina, Forys, & Clarridge, 2008).



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## Chapter Two: Literature Review

### Chronic Illness

A prolonged course of treatment is a key characteristic of chronic diseases (Lively & Antonak, 2005). The World Health Organization (WHO, 2003) adherence project defines “chronic diseases” as:

diseases which have one or more of the following characteristics: they are permanent, leave residual disability, are caused by nonreversible pathological alteration, require special training of the patient for rehabilitation, or may be expected to require a long period of supervision, observation or care. (p. 3)

For the purposes of this study, however, it was assumed that physicians would implicitly know which medical conditions fell into the “chronic illness” category.

Physicians filled out a referral form which listed several chronic illnesses, including diabetes, coronary artery disease and obesity, with an “other” designation on the form as well.

### Chronic Illness in Primary Care

The Institute of Medicine (1996) defines *primary care* as “the provision of integrated, accessible medical care, which addresses a majority of individual’s health care needs including physical, emotional, and psychological concerns and is characterized by a continuous relationship between a patient and a health care professional” (p. 31.).

Considering the characteristics of chronic diseases and of primary care medicine, it follows, then, that a significant proportion of all primary care visits are for chronic illnesses, which require ongoing appointments for the duration of the patient’s life

(Strange et al., 1998). Most people with chronic illnesses receive care from primary care

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clinicians, which is well suited to this task, given the fact that its defining features are continuity, coordination, and comprehensiveness (Rothman & Wagner, 2003). In fact, the definition of “primary care” holds that an ongoing relationship between patient and physician is a key characteristic (Platonova, Kennedy, & Shewchuk, 2008). For example, more than 90% of patients with diabetes receive the majority of their care in primary care practices (Hiss, 1996).

### Adherence

Given the rising prevalence rates of chronic illnesses and the personal and societal costs, studies that target the variables associated with adherence are essential. Interventions aimed at increasing adherence have the potential of making a far greater impact on global health than any specific technological or scientific innovation (Haynes, Ackloo, Sahota, McDonald, & Yao, 2008). Moreover, disadvantaged populations, such as the poor, will likely be particularly affected by rising prevalence rates of chronic illness, because they are disproportionately affected by chronic illnesses (NHLBI, 2007). Inadequate adherence compounds the challenges of providing effective health care to poor populations, and results in misuse and underutilization of already limited treatment resources (WHO, 2003). Inadequate care for chronic conditions contributes to the already significant burden on poor families by exacerbating the demand to provide care for family members, thereby undermining many facets of daily living, including the ability to work outside the home. Considering just these facts alone, studies such as this one, which target poorer populations disproportionately affected by chronic illness within the primary care setting to assess variables associated with adherence, seem even more essential.

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### *Definition of Adherence*

The difficulty in defining adherence in the research mirrors the complexity of the construct itself. In DiMatteo's (2004) quantitative research review of the previous 50 years, he notes that studies vary widely in methodologies, and that operational definitions of adherence are as varied as the diseases, regimes, and patients examined. The World Health Organization Adherence meeting in 2001 adopted the following definition of adherence to long-term therapy: "the extent to which a person's behavior-taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health-care provider" (WHO, 2003).

Although the research cited in this study have tended to use the terms "adherence" and "compliance" interchangeably at times, this researcher has chosen to use the term *adherence* because it connotes a more collaborative and less hierarchical relationship between clinician and patient and can more readily reflect degrees of completion in enacting the recommended behavior (DiClemente, Ferentz, & Velasquez, 2004). It is important to note, however, a majority of research has used the term "compliance" (Vermeire, Hearnshaw, Van Royen, & Denekens, 2001).

### *Types of Adherence*

Researchers have differentiated the different categories of adherence. This study will be using a measure that reflects "primary adherence". Behaviors such as keeping appointments and filling prescriptions are examples of "primary" adherence, and "secondary" adherence requires the patient to take the medication as prescribed (Wamala, Merlo, Bostrom, Hogstedt, & Agren, 2007). Meichenbaum and Turk (1987) identified three broad categories of adherence: 1) prescription and drug taking, 2) treatment

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attendance and participation, and 3) health behavior changes, and note that adherence is a complex, dynamic phenomenon that changes over time. It is also important to note that patient-centered factors associated with nonadherence can be differentiated between intentional (e.g. an explicit decision not to take medication) and unintentional factors (e.g. forgetting to take them) (Horne, Clatworthy, Polmear, & Weinman, 2001).

### *Impact of poor adherence on chronic medical conditions in primary care*

Primary care physicians play a central role in encouraging adherence to medical regimes and healthy lifestyles (Safran, Taria, Rogers, Kosinki, Ware & Tarlove, 1998; Love, Mainous, Talbert, & Hager, 2000). The implications of poor adherence to these recommendations are economic as well as medical. The medical and economic consequences of nonadherence to medications include lack of drug efficacy, disease progression, otherwise avoidable hospitalizations, and unnecessary medical expenses (Greenberg, 1984). Researchers have suggested that 28% of hospital admissions for the elderly are drug related, 40% of which are due to nonadherence (Col, Fanale, & Kornhom, 1990); with the estimated mean cost per hospital admission associated with medication nonadherence is \$2,150. A meta-analysis by Sullivan, Kreling and Hazlet (1990) estimated direct hospital costs related to medication nonadherence of \$8.5 billion dollars.

Research also suggests that only approximately half of those who have been prescribed medication take enough doses to experience a therapeutic effect (Haynes, McKibbon, & Kanani, 1996). When a patient experiences less than therapeutic effects, the physician may prescribe higher doses or discontinue the medication all together, based on the assumption that the medication was ineffective; the resulting inadequate

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course of treatment can lead to a worsening condition (Dunbar-Jacob & Mortimer-Stevens, 2001). Medical problems resulting from medication nonadherence include seizures related to discontinuation of antiepileptics, arrhythmias, and fluid retention (Urquhart & Chevalley, 1998). Among patients using statins, the risk of mortality was greatest among patient in the “low adherers” category; the same study revealed a similar (but less pronounced) dose-response type adherence-mortality association in patients using beta-blockers (Rasmussen, Chong & Alter, 2007).

Intangible costs to poor adherence include increased patient suffering, hopelessness, provider and patient frustration, and decreased quality of life for both patients and providers (Di Matteo, 2004). Research has suggested a strong association between low quality of life ratings and adherence to medical regimes in post myocardial-infarction patients (Fogel, Fauerbach, Ziegelstein, & Bush, 2004). Maintaining an acceptable health related quality of life has been shown to be vital to patient compliance and acceptance to medication therapies for patients with chronic hepatitis-C (Bernstein, Kleinman, Barker, Revicki, & Green, 2002).

### *Importance of interventions aimed at the primary care setting*

If this study substantiates the hypothesis that a better quality of the relationship between the patient and physician is associated with better adherence, despite the presence of previously established negative predictors of adherence, interventions can be developed at the primary care level. These interventions then have the potential to improve both adherence to treatment regimes for patients already experiencing the effects of chronic illness, and to behaviors that maintain health; they also have the potential to cultivate behaviors, known as primary prevention efforts, that reduce the chance of

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developing disease among healthy individuals at risk for a particular disease known as primary prevention (Antoni, Millon & Millon, 2008). It is important to note that evidenced-based primary prevention efforts (such as smoking cessation and exercise to reduce cholesterol and blood pressure) can prevent significantly more deaths than do tertiary prevention techniques (such as use of beta-blockers and aspirin in patient with cardiovascular disease) and have been shown to be more effective in lowering the risk of dying from breast cancer when compared with secondary prevention behaviors (such as obtaining a mammography) (Woolf, 1999).

### *Overview of Methods of Measuring Adherence*

The complexity involved with measuring adherence has prevented the development of a “goal standard” method of measurement in research (Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). Research has utilized multiple methods to measure adherence levels, including self-report adherence behaviors, prescription renewal rates, counting pills, and biological markers. All methods for assessing adherence have both strengths and weaknesses (Rand, 2002).

Direct measures, which involve detection of a chemical in a bodily fluid, are considered accurate but are also costly, invasive, not available for all medications (Kaplan, Greenfield, & Ware, 1989), and impractical except for single-dose medications, intermittent administrations and in hospitalized patients (Gordis, 1979). Attempting to measure adherence through indirect measures (such as health outcomes) is problematic because patients can improve for reasons other than taking the medication as prescribed and also because a patient’s condition can deteriorate or remain stable even he/she is fully adherent (Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). Objective strategies,

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such as counting remaining pills at clinic visits, are also problematic as counting inaccuracies are common and typically result in over-estimation of adherence behavior (Matsui et al, 1994).

### *Justification for use of forced-choice self-report adherence measure in this study*

Self-report of medication use is a common measure of adherence in both clinical trials and behavioral intervention studies (Goldstein, DePue, & Kazura, 2009). This study uses three self-report, forced-choice questions assessing medication use, obtaining recommended diagnostic tests and keeping appointments. Self-report is an inexpensive, brief, simple measurement strategy that is applicable to different medical regimens, and has face validity; it is also known as the acceptability of the measure to the respondent (Vitolins, Rand, Rapp, Ribisi, & Sevick, 2000). Because this study uses data obtained from patients from busy urban health care centers serving ethnically diverse and disadvantaged populations, the benefits of using a brief, patient self-report of adherence behaviors is justified. Further, studies suggest that patients are willing to self-report non-adherent behaviors (Ingersoll & Heckman, 2005), and that patients who admit that they have not followed treatment advice tend to describe their behavior accurately (Cramer, & Mattson, 1991). Research using biological markers as measures of change in health status has supported the validity of using patient subjective self-report (Kaplan, Greenfield & Ware, 1989). The decision to use the patient's self-report of adherence behavior in this study (rather than the physician's report of the patient's adherence behavior) is based upon research that reflects a tendency in providers to overestimate patient adherence (Paterson, Swindells, Mohrs, Brester, Vergis, Squier, et al., 2000; Liu, Golin, Miller, et al., 2001).

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### *Broad review of factors affecting adherence*

Research has investigated a range of factors thought to influence adherence, such as demographic variables and prescription costs. However, despite the fact that cost is a real burden, studies suggest that most patients with chronic illnesses report using their medication as prescribed even when they lack coverage and have low incomes (Piette, Heisler, & Wagner, 2004; Steinman, Sands, & Covinsky, 2001). Further, several studies on adherence to HIV/AIDS medication treatment suggest that demographic variables, such as education level, gender, and ethnicity are unrelated to adherence (Catz et al., 2000; Ingersoll, 2004; Paterson et al., 2000; Wutoh et al., 2001). Although research suggests that these factors do not play a central role in adherence behavior, other patient-centered factors, such as depression, have been established as playing a significant role in adherence behaviors.

### *Patient-centered variables that contribute to adherence in this study*

#### DEPRESSION

### *Depression is associated with adherence*

Patients with one or more chronic illness have a 41% increase in the relative risk of having a psychiatric disturbance such as depression (Wells, Golding & Burnam, 1988). This figure becomes even more pressing when one considers the fact that numerous studies have found an association between depression and non adherence (e.g. Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000; Ciechanowski, Katon, Russo, & Hirsh, 2003; Ciechanowski, Katon, & Russo, 2000; Piette, Richardson, & Valenstein, 2004; Spire et al., 2002). Compared with non-depressed patients, depressed patients are three times as likely to be noncompliant with medical treatment recommendations overall



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(DiMatteo, Lepper & Croghan, 2000). Research suggests that patients with significant depressive symptoms had more than twice the risk of cost-related under use of medications compared with those without depression (Piette, Heisler, Krein, & Kerr, 2005). Depressed patients with HIV/AIDS were nearly three times more likely to run out of medications than non-depressed patients (Ingersoll & Heckman, 2005). In primary care patients with type II diabetes, depressive symptoms were associated with decreased adherence to dietary recommendations and oral hypoglycemic medication use (Ciechanowski, Katon, & Russo, 2000).

### *Depression is associated with outcomes*

Depression is also associated with health outcomes. Compared with non-depressed patients with chronic illnesses, patients with depression have a higher degree of social and vocational impairment when controlling for severity of medical illness (Wells, Stewart, Hays, et al., 1989). Depression and depressive symptoms have also been associated with increased asthma severity and poor asthma control in primary-care outpatients (Mancuso, Wenderoth, Westermann, Choi, Briggs, & Charlson, 2008). Further, patients with inflammatory bowel disease and depressive symptoms have significantly more gastrointestinal problems and ancillary symptoms including headache and dizziness (Walker, Gelfand, Gelfand, Creed and Katon, 1996). In one randomized controlled trial of 1800 primary care patients with arthritis and depression, reducing depression severity resulted in decreased pain intensity, increased daily functioning, and improved overall health and quality of life when compared with control patients (Lin, Katon, Von Korff, Tang, Williams, Kroenke, et al., 2003).

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The presence of comorbid depressive symptoms has been shown to have a significant impact on health outcomes, healthcare utilization, and overall functioning in patients with diabetes (Egede, Zheng, & Simpson, 2002; Lustman, Clouse, & Freedland, 1998). Depression is associated with poor glycemic control in diabetic patients (Lustman, Anderson, Freedland, deGroot, Carney, & Clouse, 2000). In addition, patients who have depression and diabetes have higher rates of cardiovascular complications such as stroke and myocardial infarction compared with their non-depressed counterparts (Hanninen, Takala, & Keinanen-Kiukaanniemi, 1999) and they also report more diabetes related symptoms (Ciechanowski, Katon, Russo, & Hirsch, 2003).

Depression also impacts outcomes in patients with heart disease. Research has found that depressed men have a 71% greater risk of developing heart disease and are over two times more likely to die from the disease, compared with non-depressed men (Ferketich, Schwartzbaum, Frid, & Moeschberger, 2000). The Cardiovascular Health Study demonstrated that when compared with individuals who have low depression scores, healthy individuals with high depression scores had a 40% to 60% increased risk of coronary disease and death (Ariyo, et al., 2000; Rozanski, Blumenthal & Kaplan, 1999). Further, patients with elevated depression scores have significantly higher rates of non completion of cardiac rehabilitation programs (Caulin-Glaser, Maciejewski, Snow, LaLonde & Mazure, 2007). Therefore, the use of depression as a negative predictor of adherence in patients with chronic illness is well-grounded and relevant to this study.

Research has also sought to understand additional patient-centered factors other than depression that are likely to impact adherence other than depression. This research

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has been focused on identifying personality-centered coping styles that may impact an individual's likelihood of following medical advice.

### OPPOSITIONAL COPING STYLE

*Oppositional Coping Style is associated with adherence*

Another emerging focus of research on patient-centered factors associated with adherence is patients' differences in coping styles. Patients who use different coping styles tend to have differing levels of success in responding to treatment when undergoing rehabilitation (Cipher & Clifford, 2003). In one study using the precursor to the MBMD with pain patients, a hierarchical cluster analysis using the Coping Scales of the Millon Behavioral Health Inventory ([MBHI] Millon, Green, & Meagher, 1979) successfully identified patients at risk for nondisclosure of psychosocial dysfunction, emotional distress, and those patients most likely to comply with treatment in patients undergoing rehabilitation after injury (Cipher, Clifford, & Schumacker, 2002). Subsequent research on coping styles, using the MBMD substantiates the claim that the MBMD can be used reliably to predict variations in rehabilitative treatment outcomes (Cipher, Kurian, Fulda, Snider & Van Beest, 2007). Therefore, patients who meet criteria for an oppositional coping style can be viewed as reflecting a tendency towards poor adherence; this factor is therefore a relevant and important construct for use in this study.

### PROBLEMATIC COMPLIANCE

*Problematic compliance is associated with adherence*

In addition to differences in coping styles, research has sought to identify additional behavioral and attitudinal tendencies that may be useful in predicting

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adherence to treatment recommendations. Researchers have examined the association between scores on the MBMD's Treatment Prognostics scales (Interventional Fragility, Medication Abuse, Information Discomfort, Utilization Excess, and Problematic Compliance) to predict adherence to warfarin, an anti-clotting medication often used for patients at risk for stroke (Cruess, Localio, Platt, Brensinger, Christie, Gross, et al., 2009). Although the results of this study supported four of the five Treatment Prognostics scales as being significantly associated with medication non-adherence (Cruess, Localio, Platt, Brensinger, Christie, Gross, et al., 2009), the Problematic Compliance scale was not found significant. Although this replicates results of an earlier study (Cruess, Minor, Antoni, & Millon, 2007), the use of the Problematic Compliance subscale for this study is exploratory and may add to an understanding of the usefulness of this particular subscale with these patients.

### MILLON BEHAVIORAL MEDICINE DIAGNOSTIC (MBMD)

#### *Development*

The Millon Behavioral Medicine Diagnostic (MBMD; Millon, Antoni, Millon, Meagher, & Grossman, 2001) is an assessment tool specifically developed for use with medical patients experiencing a broad range of medical illnesses, because it assesses the psychological and behavioral factors that impact treatment (Atkinson, 2003).

Understanding psychosocial factors, such as personality and coping styles, that are associated with the likelihood of a patient seeking or delaying help after warning signs (e.g. acute coronary symptoms) may have significant implications for reducing the severity of a traumatic medical event as well as its associated costs (Antoni, Millon, & Millon, 2008). The Millon Behavioral Medicine Diagnostic ([MBMD]; Millon, Antoni,

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Millon, Meagher, & Grossman, 2001) is a 165 item, self-report inventory. The main sections of the MBMD include: a) Psychiatric Indications, b) Coping Styles, c) Stress Moderators, d) Treatment Prognostics, and e) Management Guides (Millon et al., 2001).

The MBMD was designed to provide information capable of predicting behavioral responses to new symptoms, adjustments to medical illness, efficacy of secondary prevention efforts, and physical course of the disease (Antoni, Millon & Millon, 2008).

### *Psychometrics of MBMD*

The MBMD was normed on 720 adult (age 18-85) medical patients with conditions that included including diabetes, chronic pain, cardiology, cancer, neurological, HIV/AIDS and an “other” category (Millon et al., 2001). It was adapted from the existing Millon Behavioral Health Inventory ([MBHI] Millon, Green, & Meagher, 1979), a measurement tool praised for its sound psychometric properties, clinical usefulness, and application to a wide range of medical condition and settings (Livneh & Antonak, 2005). The MBMD was developed to establish relevant normative data for a purely medical population, whereas the MBHI was normed using a combination clinical/nonclinical group (Atkinson, 2003). It is essential to use an assessment tool specifically normed for medical patients when assessing depression in medical patients because of the overlap of somatic symptoms, recovery from a medical procedure, or side effects from medication (Graves & Miller, 2003). The patient sample represented White (61%), African American (16%), and Hispanic (19%) respondents. The MBMD has been found to be both internally reliable (internal consistency coefficient mean for all scales = .79) and consistent (test-retest reliability mean for all scales = .83) (Millon et al., 2001). The correlation between the MBMD Depression Scale and Beck

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Depression Inventory (BDI; Beck et al., 1961) was .87 during validation studies. Scores from the Psychiatric Indicators domain used in this study are among the most reliable (Caruso, 2003). To counter the naturally occurring skew in clinical data, the MBMD uses Prevalence Scores (PS) rather than normalized T-scores to identify the existence of a disorder rather than determining the place of an individual on a normal curve distribution (Atkinson, 2003).

*The MBMD has been successfully used in a variety of patient populations*

The MBMD as a whole has been shown to predict adherence to highly active antiretroviral therapy (HAART) in HIV positive men (Cruess, Minor, Antoni, & Millon, 2007). In addition, the MBMD is one of the most widely used psychometric of patients undergoing evaluation for bariatric surgery for obesity (Walfish, Vance & Fabricatore, 2007). In fact, psychologists working with bariatric patients are increasingly turning with increased frequency to the MBMD to evaluate prospective patients (Walfish, Wise, & Streiner, 2008). Although there are researchers who disagree about the usefulness of the MBMD with this population (Walfish, Wise, & Streiner, 2008), others point out that clinicians are helped by the predictive judgments about patient behavior (Strack, 2008).

### Patient-Physician Relationship

*The patient-physician relationship is associated with adherence*

There continues to be a tendency in research to focus on patient-related factors as the causes of poor adherence despite the considerable effect that provider and health system related determinants have on adherence; and interventions that target the relevant factors in the healthcare environment are urgently needed (WHO, 2003). Possible explanations for this shortage of system-related factors may include the fact that

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physicians are often taught that the professional's role is to make recommendations and the patient's role is to follow these and "be compliant", making the issues of compliance almost entirely a patient's problem (DiClemente, Ferentz, & Velasquez, 2004). The lack of research on non-patient centered factors affecting adherence reflects the bias that adherence is a patient-driven problem; this is likely due to a misunderstanding of how other factors affect individual's behavior and capacity to adhere to his or her treatment (WHO, 2003).

It is the examination of these other factors, including the patient-physician relationship, which represent an opportunity to understand more fully the interaction between the patient and his/her environment and its impact on adherence. The focus on the patient-physician relationship coincides with the shift of the health burden from acute to chronic conditions (Clark, Cabana, Nan, Gong, Slish, Birk & Kaciroti, 2008). The shift from a biomedical perspective to a more humanistic, biopsychosocial perspective is typified by a patient-physician partnership that is patient-centered and collaborative, and is viewed as a reciprocal relationship between multidimensional systems (Mead, Bower, & Hann, 2002). More recently research, has examined the connection between patient-provider relationships, patient adherence, and patient outcomes. Although a considerable amount of research has been done on variables such as patient satisfaction and treatment adherence, researchers have only recently begun to explore the direct role that the patient-physician relationship plays in the treatment and outcome of chronic and serious medical issues such as diabetes, hypertension, cancer, heart disease and obesity (Fuentes, Mislouack, Bennett, Paul, Gilbert, Fontan, & Boylan, 2007).

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### *Historical context of the patient-physician relationship*

The paternalistic model and the participatory model are the two predominant models used to conceptualize the patient-physician relationship since the mid-20<sup>th</sup> century (Cvengros, Christensen, Hills & Rosenthal, 2007). Over time, the expectation for the relationship between the physician and the patient has shifted from the dominance of the technically informed expert (symbolized by the paternalistic model) to the collaboration between the expert in medicine (the physician) and the expert in how the disease manifests itself in everyday life (the patient), a paradigm symbolic of the participatory model (Clark, et al., 2008). Examining the influence of the relationship is supported by the fact that primary care physicians and patients with chronic illnesses must have an ongoing dialogue about treatment issues such as self-management. Self-management refers to the full range of activities undertaken by someone with a chronic illness, including preventative activities, lifestyle changes, treatments and behaviors that manage symptoms (Barlow, Wright, Sheasby Turner, & Hainsworth, 2002). Supporting self management by patients with chronic illness is an accepted and important part of addressing disease burden and healthcare services (Furler, et al., 2008). Therefore, living with and self-managing a chronic illness such as diabetes is as much a social and emotional task as a technical one (Furler et al., 2008). This new conception of the importance of this relationship has become a standard and accepted focus in discussions on quality of health care among professionals (Saba, Wong & Schillinger, et al., 2006). Most patients want strong relationships with their physicians (Safran, 2003; Love, Mainous, Talbert & Hager, 2000).



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### *Relationship is associated with adherence*

Regression models have demonstrated empirical proof of how an increment in improvement in the patient-physician relationship quality is associated with an increment in improvement in self-reported adherence (Schneider et al., 2004). Ingersoll and Heckman (2005) have demonstrated that the patient-provider relationship influences adherence to medication adherence in HIV patients, even when mental health variables are considered. Physician familiarity with the patient and patient trust in the physician have been associated with adherence to physician advice regarding substance use, safe sex, diet and stress management; and these two relationship variables, therefore, have accounted for 14% of the variance in medical adherence (Safran et al., 1998). In a correlational study of over 700 outpatients, Bakken et al (2000) found that patients who were more fully engaged with their providers evidenced better adherence to medications and appointments and experienced better immune health than their less-connected peers. Another study suggests a robust association between the strength of the patient-physician relationship (measured by trust and commitment to the physician) and the patients' adherence to medical recommendations and healthy eating behavior (Berry et al., 2008). Moreover, patients with ongoing relationships with their physicians, involving effective communication with a trusted doctor who shares their preferences about health care, are more likely to follow medical advice, comply with preventative measures, adopt healthier lifestyles, and comply with medication regimes (Safran, Taira, Rogers, Kosinski, Ware & Tarlove, 1998; Stewart, 1995).

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### *Relationship is associated with medical outcomes*

Research has also demonstrated an association between the relationships and medical outcomes. In one RCT involving primary care physicians and over 600 patients, patients who were engaged in interactions with their physicians, characterized as using better communication skills, reported reduced emotional distress over a 6 month period (Roter, Hall, Kern, Barker, Cole, & Roca, 1995). Kaplan, Greenfield & Ware (1989) note that communication (expression of positive and negative affect, and amount of information exchanged) is central to the nature of the patient-physician relationship, and found that interactions reflective of this type of communication between the patient and their physician were associated with better control of diabetes and hypertension at follow-up for primary care patients with chronic illness. Orth, Stiles and Scherwitz's study (1987) primarily with minority hypertension patients from disadvantaged urban areas, demonstrated an association between better blood pressure control and patient-provider interactions characterized by the patient's expression of illness in details (rather than "yes" or "no" responses to questions) and the physician's sharing of greater clinical information. Further studies have found an association between the characteristics of the interaction between patient and physician in the primary care setting with fewer diagnostic tests (Epstein, Franks, Shields, Miller, Campbell, & Fiscella, 2005).

### *Methods of measuring patient-physician relationship*

Research efforts examining the influence of the patient-physician relationship on adherence are affected by the fact that few researchers and clinicians are familiar with the methods used to measure the quality of the patient-physician relationship in relation to medication adherence (Schneider et al., 2004). Despite this, standardized assessments

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have been developed. Examples of standardized assessments include the Primary Care Assessment Survey (PCAS, Safran et al., 1998) and the Trust in Physician Scale (Thom, Ribisi, Stewart & Luke, 1999). Although multidimensional measures may provide more information, drawbacks include time needed to take the measure, and patients' frustrations with questions which may appear to be repetitive, asking the same questions over and over (Robins, Hendin, & Trzesniewski, 2001). Because the data for this study are archival, the independent variable *relationship* will be operationally defined as consisting of 2 variables, *trust* and *satisfaction*.

### Variables Associated with the Relationship in this study

#### *Trust is essential to the relationship*

Research supports the use of trust as an essential component of the patient-physician relationship (Mechanic & Schlesinger, 1996; Thom & Campbell, 1997; Thom, Hall & Pawlson, 2004). The concept of trust in one's physician has gained prominence in recent years, considered an important way of assessing patient-physician relationships (Rawaf & Kressin, 2007). Patient trust is defined as a belief that the physician will act in the patient's best interest and will provide appropriate treatment and medical care (Thom & Campbell, 1997). Despite the acknowledged importance of assessing trust, it is a complicated, multidimensional construct and empirical research on patient trust is somewhat limited (Pearson & Raeke, 2000; Thom & Campbell, 1997). Research suggests that trust in one's physician is even more important than treatment satisfaction in predicting subsequent adherence to recommendations and overall satisfaction with care (Thom, Ribisi, Stewart, & Luke, 1999; Hall, Dugan, Zheng, & Mishra, 2001; Safran, Kosinski, Tarlove, et al., 1998). This study will therefore seek to expand an

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understanding of the influence of trust in the patient-physician relationship through an exploratory study using this variable.

### *Factors associated with trust*

The research suggests multiple influences on the level of trust in the patient-physician relationship. For example, the physician's demeanor during a patient encounter influences how much that patient trusts the physician (Fiscella, Meldrum, Franks, et al., 2004). Higher levels of trust are reported when patients view their physicians as attempting to understand their experiences, share power, communicate plainly, provide necessary referrals and are technically competent (Thom & Campbell, 1997; Grumbach, Selby Damberg et al., 1999; Thom, 2001). In Carr's 2001 qualitative study with HIV patients, trust was explicitly identified as an important relationship factor that was based on length of the relationship, overall feeling of comfort with the physician, physician skills and knowledge, apparent enthusiasm, nonjudgmental attitude, understanding of the patient's personal situation, reassuring behaviors and general willingness to collaborate in care.

### *Trust is associated with adherence*

Trust is an important focus of research because it is associated with adherence. In a large-scale study of adherence to antiretroviral medications (554 patients over 22 outpatient HIV outpatient practices), trust in the physician was independently associated with adherence (Schneider, Kaplan, Greenfield, Li, & Wilson, 2004). As previously noted, physician trust is positively correlated with acceptance of new medications (Altice, Mostashari, & Friedland, 2001), but lack of trust in the healthcare system is associated with non-adherence to medication (Fogarty, Roter, Larson, Burke, Gillespie, & Levy,

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2002; Bravemen, Egerter, Cubbin, & Marchi, 2004; Murphy, Chang, Montgomery, Rogers & Safran, 2001; Kerse, Buetow, Mainous, Young, Coster, & Arroll, 2004; Thom, Hall, & Pawlson, 2004). Patient trust is also associated with the patient's intention to follow medical advice and perceived effectiveness of care (Safran, et al., 1998; Hall, Zheng, Dugan et al., 2002; Goold, 2001; Thom, 2000). Patients with the lowest levels of adherence to hypertensive medication have exhibited low trust in their physicians (Hopfield, Linden, & Tevelow, 2006). Further, findings suggest that a trusting patient-physician relationship may moderate the impact of cost pressures on patient's medication adherence (Piette, Heisler, Krein, & Kerr, 2005).

### *Support for using single-item measures of trust in this study*

Researchers have noted the benefits of using simpler, self-reported measures when appropriate (Burisch, 1984). Because this study uses a self-report measure, the desire to be perceived in a socially desirable manner is a possible bias (Berry et al., 2008). However, research supports the use of self-report measures for developing hypotheses (Shanafelt, Bradley, Wipf, & Black, 2002). In addition, the benefits of using single-item measures include eliminating item redundancy and therefore reducing the boredom, frustration and fatigue associated with answering highly similar questions repeatedly, that are sometimes found in longer measures (Robins, Hendin, & Trzesniewski, 2001). Because of the setting and the number of assessments needed to be completed by the participants in this study, this consideration is especially relevant.

Further, although the use of single-item measures for psychological constructs such as job satisfaction has primarily been discouraged because they are presumed to have unacceptably low reliability (Wanous, Reichers, & Hudy, 1997; Wanous & Hudy,

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2001), a meta-analysis of research supports single-item measures, because single-item measures of overall job satisfaction have been correlated with scales measuring the same construct, with correlations averaging .63 (Wanous, Reichers, & Hudy, 1997). Further support for single-item measures include the finding that differences in the ways that scales are measured affect the results; however, differences among single-item measures have no effect on results, suggesting that the single-item measures may be more robust than scale measures (Wanous & Hudy, 2001).

Research about global self-esteem has supported the idea that a single-item measure (SISE, Single-Item Self Esteem Scale) can have almost identical patterns of correlates as a multiple-item measure (RSE-Rosenberg Self-Esteem Scale), and showed strong convergent validity across genders, ethnic groups, and college and community participants (Robins, Hendin, & Trzesniewski, 2001). Research investigating global quality of life measures confirms that single-item global questions have shown high test-retest reliability (deBoer, van Lanschot, Stalmeier, van Sandick, Hulscher, deHaes, et al., 2004). Research has also used single-item measures to supplement more extensive measures, including subjective well-being (Diener, Sandvik, Seidlitz, & Diener, 1993), and a single-item pictorial measure of relationship (Aron, Aron, & Smollen, 1992).

### *Satisfaction is also part of the relationship*

In addition to level of trust, the patient's perception on the quality of medical care ("patient satisfaction") is another very important variable contributing to the quality of the patient-physician relationship (Salisbury et al., 2005). Further, the concepts of trust in one's physician and satisfaction with health care services are strongly interrelated (Hall et al., 2002), lending support, in this study, for the conceptualization of the patient-

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physician relationship as comprising trust and satisfaction in this study. Trust contributes to patient satisfaction and is influenced by the patient's perception of compassionate and competent medical care and information sharing (Thom, Ribisi, Stewart & Luke, 1999; Thom, 2001; Ziegler, Mosier, Buenaver, & Okuyemi, 2001). Research further suggests that the quality of the patient-physician relationship and the capability of the health care system to satisfy the health care needs of the individual may determine patients' trust and thus impact adherence with medication (Mechanic, 1996; Westin, Ahs, Persson, & Westerling, 2004).

Some research suggests that satisfaction is an antecedent of trust in one's PCP (Geyskens, Steenkamp, & Kumar, 1999) and others believe trust to be a significant predictor of patient satisfaction with his or her physician (Thom, Ribisi, Stewart, & Luke, 1999; Baker, Mainous, Gray & Love, 2003). Platonova, Kennedy, and Shewchuk (2008) assessed constructs of trust, satisfaction and the interpersonal relationship. This study found strong support for the interconnectedness of these constructs, a strong linkage between patient trust to both satisfaction and loyalty, and that a good personal relationship with the PCP is important in order for patients to feel satisfied. These researchers also found that costs and attractiveness of alternatives did not seem to affect patient's level of loyalty to his or her PCP. Last, these researchers found that patient trust and a good interpersonal relationship play a crucial role and are major determinants of patient satisfaction with the primary care provider; this is in line with the American Board of Internal Medicine's (ABIM) position that trust is vital to the patient-physician relationship (ABIM, 2002; Platonova, Kennedy, and Shewchuk, 2008). To illustrate further the interconnection between the constructs of satisfaction, trust, the relationship,

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and adherence, research has found that patients are more satisfied when they have an ongoing relationship with a trusted physician who shares their preferences for health care; these patients may be more likely to follow their doctors' recommendations, including taking medication, adopting healthy lifestyles, and complying with preventative measures (Schwartz, Hasnain, Eiser, Lincoln, & Eistein, 2006).

Researchers note that the conceptualization and assessment of patient satisfaction is complex (Evans, Edwards, Evans, Elwyn, & Elwyn, 2007). Some studies have borrowed the definition of "satisfaction with medical services" from the marketing literature. Oliver (1999) defines satisfaction as a somewhat temporal state that impacts ongoing consumption based on how the product or service has fulfilled its purpose. In regard to medical care, satisfaction is conceptualized as an immediate phenomenon, evaluating the service after experiencing it, and which forms more quickly and is more susceptible to change corresponding to differences in medical care experiences (Butler, & McGlone, 2002). Although certain factors, such as perceived lack of choice, may influence the patient to stay in a relationship with a physician who has not met expectations, it is reasonable to hypothesize that the level of satisfaction is an important component when assessing the quality of the relationship. Safran, Montgomery, Chang, Murphy, and Rogers (2001) found that patient dissatisfaction with medical care significantly predicted voluntary physician switching. Thus this study is predicated on the idea that the identification of the level of patient satisfaction is an important construct to identify when assessing quality of the relationship.



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### *Factors associated with satisfaction*

Preliminary research that elicited rankings from doctors and parents of chronically ill children regarding the importance of certain elements of healthcare delivery (“quality of healthcare/satisfaction”) suggested that although the “quality of health care” might seem to be a universal concept, variability between individuals and societies do exist (Garson, Yong, Yock, & McClellan, 2006). Research examining factors associated with patient satisfaction has supported the importance of the length of the encounter and characteristics of the interaction (Gascon, Sanchez-Ortuno, Llor, Skidmore, & Saturno, 2004) to the patient’s level of involvement in decision-making, with higher patient satisfaction associated with greater involvement across all racial and ethnic groups studied (Beach, Sugarman, Johnson et al., 2005); however, nativity status also appears to play a role (Dallo, Borrell, & Williams, 2008). Patients who reported seeing the same physician always or most of the time had patient satisfaction scores that were significantly higher than those who did not see the same physician (Fan, Burman, McDonell, & Fihn, 2005).

Additional factors influencing satisfaction in the relationship include accessibility; greater satisfaction is associated with the ability to obtain an appointment on the same or on the following day, to have a brief wait time in the waiting room, and to see the same doctor (Bower, Roland, Campbell, & Mead, 2003). Patients are more satisfied with a doctor who appears warm, friendly and with a reassuring demeanor (Di Blasi, Harkness, Ernst, Georgiou, & Kleijnen, 2001). Greater satisfaction is reported when a patient feels that a physician pays attention to his or her concerns and expectations, provides a clear

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explanation of the diagnosis and prognosis and shares decision making with the patient (Little, et al., 2001).

### *Satisfaction is associated with adherence*

Studies assessing satisfaction in the patient-physician relationship are essential because satisfaction is associated with adherence. Patient satisfaction with the patient-physician relationship has been related to adherence to HIV medication (Martini et al., 2002). Schneider, Kaplan, Greenfield, Li, and Wilson's (2004) large-scale study of adherence by HIV patients also determined the fact that overall satisfaction was independently associated with adherence. In another outpatient survey, less satisfaction with the doctor's appointment was associated with less intention to adhere to recommendations (Bell, Kravitz, Thom & Krupat, 2002). Satisfaction with the psychosocial aspects of the patient-provider encounter (such as the therapeutic alliance) is associated with adherence in primary care patients with hypertension (Birtwhistle, et al., 2004; Kjellgren, Svensson, Ahlner, & Saljo, 2000).

Research examining satisfaction is also complex because not all populations want the same things from their health care interactions (Hausman, 2004). For example, elderly patients' adherence is associated with a positive social interaction, but they do not want to be as highly involved in decision-making (Hausman, 2004). Similarly, Hispanic Americans' adherence behaviors are more tightly linked to their satisfaction with their providers (Hausman, 2004). Another study, in Philadelphia, with ethnically diverse, low income patients with chronic illness (diabetes and asthma) examined the influence of provider support on satisfaction. This study found that patients with strongly positive assessments of their providers were substantially more confident in their abilities to care

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for their illnesses; high provider assessment in diabetes patients was also a strong predictor of performing a greater number of self-management activities (Greene & Yedidia, 2005). Higher satisfaction is also associated with following medical advice, continuing with the same physician, and reporting that their PCP provided the best level of care compared with patients who were assigned to their PCP (Hsu et al., 2003). This finding was replicated in a study of patients with diabetes from a primary care setting; patients who chose their PCP reported significantly higher levels of satisfaction and were significantly more likely to have diagnostic tests performed, including cholesterol levels and retinal exams (Krupat, Stein, Selby, Yeager, & Schmittiel, 2002).

### *Satisfaction is associated with medical outcomes*

Low satisfaction with outpatient office visits is associated with (patient-reported) lesser amounts of improvement on health problems compared with individuals reporting higher satisfaction (Bell, Kravitz, Thom & Krupat, 2002). Greater patient satisfaction has been associated with shorter hospitalizations and fewer emergency hospital admissions (Wassson et al., 1984). A longer relationship is indicative of greater satisfaction in the relationship (Schwartz, Hasnain, Eiser, Lincoln & Eistein, 2006); research also suggests greater patient satisfaction is associated with health outcomes including improved glycemic control and increased monitoring and management of diabetic complications (Clark, Snyder, Meek, Stutz, & Parkin, 2001). Research on patient satisfaction with outpatient diabetes patients has been used to assess the type of treatment delivery system; those who demonstrated a marked increase in satisfaction also demonstrated a marked improvement in factors associated with diabetes control (Rosenstock, Cappelleri, Bolinder, & Gerber, 2004).

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### *Evaluation of alternative measures of satisfaction*

As noted by Evans, Edwards, Evans, Elwyn, & Elwyn, (2007), all of the instruments which focus on the measurement of “patient satisfaction” with medical services attempt to evaluate both the organization and individual physician in a single instrument; these have the potential for crossover bias and the potential for patients to be unclear about whether or not they are evaluating the medical practice or their individual doctors. However, considering the constraints of the setting in which this data was obtained, the benefits of using a single-item measurement self-report measure of satisfaction is warranted, and has been discussed previously.

### Physician-centered factors associated with patient adherence

There has been relatively limited research exploring physician-centered factors that contribute to the patient-physician relationship and patient adherence. Studies focused on physician-based factors suggest that physicians who are very low in self-criticism and are more likely to blame others rather than themselves have more difficult relationships with their patients (Firth-Cozens, 1995). Evidence also suggests that physicians respond to empathic opportunities very infrequently and that physicians commonly respond to affect or the potential for affect with avoidance, with negative impact on the relationship because this leaves patients feeling misunderstood and poorly cared for (Suchman, Markakis, Beckman & Frankel, 1997). Despite the acknowledged benefits of positive relationships on the progression and outcomes of care, and the increased risk of malpractice when relationships are problematic, there is evidence that primary care physicians have difficulty developing key relationship skills such as empathy (Maguire, Fairbairn, & Fletcher, 1986).

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Research has attempted to assess the influence of the physician's level of satisfaction on patient adherence. Patients of less satisfied physicians have been shown to receive lower quality of care, be less adherent, and have lower levels of patient satisfaction and trust; further, dissatisfied physicians are more likely to reduce work hours or retire early, leading to disrupted treatment relationships, increases in physician training costs, and less access to care (Landon, Reschovsky, & Blumenthal, 2003; Landon, Reschovsky, Pham, & Blumenthal, 2006; Grembowski et al., 2005; Williams & Skinner, 2003; Mello et al., 2004; Zuger, 2004). Methods of measuring physician satisfaction have included the use of questions related to general overall career satisfaction, using a 5 point Likert scale (very satisfied to very dissatisfied) and then creating a binary variable equal to one if the physician reported being very satisfied with his/her career and zero otherwise (Sloan, Rattliff, & Hall, 2008). This study will quantify the physician's level of satisfaction by coding responses into categories and ensuring validity and reliability through the use of a second rater.

Importance of measuring symmetry between patient and physicians' responses

Relatively few studies have attempted to examine the symmetry between the perception of the patient-physician relationship both from the patient's and from physician's perspective, despite its acknowledged usefulness (Berry et al., 2008). As already stated, focusing on the symmetry of the patient's and the physician's perspectives as the unit of analysis has recently gained momentum (Krupat, 2006). Assessing the concordance of the responses is important because research supports the idea that greater similarity on certain constructs enhances patient satisfaction. For example, one study measured preferences for physician behaviors both from the patient and from the

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physician perspective, and found that preference fit was associated with enhanced patient satisfaction (Schwartz, Hasnain, Eiser, Lincoln, & Elstein, 2006). In another study, primary care appointments characterized by higher levels of concordance (as reported by the physician) were associated with one-third higher levels of medication adherence (Kerse et al. 2004). A study that assessed patient and provider preferences regarding patient involvement in treatment decision-making found that patient satisfaction was greatest when both patient and provider had preferences for greater patient involvement in decision-making (Jahng, Martin, Golin & DiMatteo, 2005). Another study that evaluated the “fit” between patient preferences for physician behaviors ( e.g. decision-making style and consideration of patient’s religion) and physicians’ preferences for their own behaviors demonstrated that patients who differed more significantly from their physicians in preference for physician decision-making reported less satisfaction with their physicians (Schwartz et al. 2006). Greater concordance between patient and physician preferences for patient involvement has also been shown to be a significant predictor for patient self-report of adherence in patients from family medicine and in student health service clinics (Jahng et al. 2004).

### Use of moderators in study

Research supports the importance of providing information of possible moderators of treatment outcomes to guide future studies and inform clinical applications (Kraemer, Wilson, Fairburn, & Agras, 2002). A moderator is a qualitative or quantitative variable that affects the direction and/or strength of the relationship between an independent or predictor variable and a dependent or criterion variable (Baron & Kenny, 1986). A “moderator effect” can be represented as an interaction between a central

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independent variable and a factor that specifies the appropriate conditions for its operation (Baron & Kenny, 1986). Therefore, because this study seeks to examine the influence of one variable (the relationship) on the association between another independent variable (e.g. depression) on the dependent variable (adherence), the use of statistics analyzing a moderator effect is most appropriate. One example of a study examining moderators demonstrated the fact that absences of the diagnosis Oppositional Defiant Disorder at school, an increased number of teacher-identified symptoms of ADHD, and younger age at identification were moderators of adherence to stimulant medication over 3 years (Thiruchelvam, Charach & Schachar, 2001).

### New Contribution

The major aim of this study is to add to an understanding of the patient-physician relationship and how this relationship is related to adherence. Given the integral role of the PCP in identifying and providing care for chronic illness, it naturally follows that the patient and primary care provider relationship may play a vital role in improving adherence. Sustained relationships with PCPs are associated with a stronger patient-physician relationship and better treatment outcomes (O'Malley, Forrest, & Mandelblatt, 2002; Parchman & Burge, 2003), compliance with medications and appointments, patient disclosure of behavioral problems, and reduced cost of care (Gabel, Lucas, & Westbury, 1993). Therefore, given the crucial role of the PCP in delivering a range of medical care, efforts to improve understanding of this relationship is warranted (Montgomery et al., 2004). This study will take two variables that are accepted as integral to that relationship, i.e. trust and satisfaction, and will assess how greater levels of these predictors of better adherence may influence adherence, despite well accepted predictors of poor adherence,

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such as depression. This research also contributes conceptually to current research on the relation between the relationship between depression and adherence. Last, it furthers our understanding of how the symmetry between patient and provider perceptions is associated with better or worse adherence.



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## Chapter Three: Hypotheses

This research project is guided by the following question: Does the quality of the patient-physician relationship moderate predictors of poor adherence in urban, underserved and vulnerable patients with chronic illness?

The goal of this study is to examine data from 100 primary care patients; if the total number of participants at the time of analysis falls short of this aim, all subject data to date will be used. Based on participants' responses to the Millon Behavioral Medicine Diagnostic (MBMD) completed at intake as part of a larger study, participants will be defined as belonging to one of three levels on three clinical scales: Depression, Oppositional Coping Style, and Problematic Compliance. Each clinical scale category will be divided into three levels based on prevalence score ranges on the MBMD.

Prevalence scores of 74 or below will operationally define the category reflecting the absence of the clinical scale (e.g. non-depressed, non-oppositional and non-problematic compliant). Prevalence scores between 75 and 84 will operationally define the category reflecting the suggestive range of the clinical scale. Prevalence scores of 85 and above will operationally define the category reflecting the prominent range of the clinical scale.

Patients will also be divided into three groups which are categorized by the level of perceived quality of the patient-physician relationship based on patients' responses to questions completed at intake as part of the larger study: "low" relationship quality, "medium" relationship quality, and "high" relationship quality. The "relationship" will be quantified using two components of the qualitative questionnaire, "level of trust in the relationship" and "satisfaction with medical services". Responses deemed suggestive of a "low" level of trust will be assigned a value of "1"; responses deemed suggestive of a

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“medium” level of trust will be assigned a value of “2”, and responses deemed suggestive of a “high” level of trust will be assigned a value of “3”. Similarly, responses indicative of a “low” level of satisfaction will be assigned a value of “1”; responses deemed indicative of a “medium” level of satisfaction will be assigned a value of “2”, and responses deemed indicative of a “high” level of satisfaction will be assigned a value of “3”. Scores from these 2 questions will then be added in order to establish the 3 levels of the relationship, with possible total scores ranging from 2 to 6. A “low relationship” will be operationally defined as a total score of 2 or 3; a “medium relationship” will be operationally defined as a total score of 4 or 5, and a “high relationship” will be operationally defined as a total score of 6.

Last, patients’ levels of adherence to medical regimes will be examined as a continuous variable based on participants’ responses to three questions in the “Behavioral Measures of Adherence” portion of the intake evaluation of the larger study. A value of “1” will be assigned to “no” responses and a value of “2” will be assigned to “yes” responses. Total scores from the three questions will therefore range from 3 to 6.

The main (non-exploratory) hypotheses will use data gathered from the patients’ perspectives only. Exploratory hypotheses, which are designed to examine the physicians’ perspectives and also the symmetry in responses between patients and physicians, will utilize data from both the patient and the physician. Data from the physicians’ responses will be quantified using the same method utilized in gathering the patients’ responses.

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### Statement of the Hypotheses

#### Set # 1: Depression

Hypothesis 1: The first hypothesis examines the main effect for depression on adherence.

Specifically, it is hypothesized that “prominently” depressed patients will show significantly lower adherence scores than “non-depressed” patients. It is also hypothesized that patients with “suggestive” levels of depression will have better adherence than patients with a “prominent” level of depression but less adherence than patients who are “non-depressed”.

H<sub>1</sub>: The greater the level of depression the lower the adherence.

H<sub>0</sub>: There is no difference in adherence levels among non-depressed patients, patients with a “suggestive” level of depression, and patients with a “prominent” level of depression.

Rationale: Previous research has established depression as a predictor of poor adherence.

Hypothesis 2: The second hypothesis examines the main effect for relationship.

Specifically, It is hypothesized that the better the (patient reported level of) relationship the better the adherence.

H<sub>1</sub>: The greater the level quality of the patient-physician relationship the better the adherence.

H<sub>0</sub>: There is no difference in adherence levels for patients with a low, medium, or high perceived quality of the patient-physician relationship.

Rationale: Previous research has established that a good patient-physician relationship predicts better adherence to medical regimes.

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Hypothesis 3: The third hypothesis examines the interaction effect for depression and for the relationship. Specifically, it is hypothesized that if the patient has suggestive or prominent levels of depression and a poorer relationship, he/she will show poorer adherence as compared with a patient with suggestive or prominent levels of depression with a better relationship or a non-depressed patient (regardless of relationship).

H<sub>1</sub>: Patients with suggestive or prominent levels of depression and a better relationship will show better adherence than patients with suggestive or prominent levels of depression and a poorer relationship.

H<sub>0</sub>: The level of patient-physician relationship does not affect adherence regardless of level of depression.

### Set # 2: Oppositional Style

Hypothesis 4: The fourth hypothesis examines the main effect of an oppositional coping style on adherence. Specifically, it is hypothesized that patients with scores within the prominent range of an oppositional coping style will show significantly lower adherence scores than patients with scores in the non-oppositional coping style range. It is also hypothesized that patients with scores within the suggestive range will have better adherence than patients within the prominent range but will have less adherence than non-oppositional patients.

H<sub>1</sub>: The greater the level of oppositional coping style, the lower the adherence.

H<sub>0</sub>: There is no difference in adherence level among non-oppositional patients, patients with scores falling within the suggestive range, and patients with scores falling within the prominent range of an oppositional coping style.

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Rationale: Research indicates that medical patients who score high on this scale are often unpredictable and difficult in their transactions with their healthcare providers, and may be erratic in following their treatment plan.

Hypothesis 5: The fifth hypothesis examines the interaction effect for oppositional coping style and the relationship. Specifically, it is hypothesized that if the patient has suggestive or prominent levels of an oppositional coping style and a poorer relationship, he/she will show poorer adherence, as compared with a patient with suggestive or prominent levels of an oppositional coping style with a better relationship or with a non-oppositional patient (regardless of relationship).

H<sub>1</sub>: Patients with suggestive or prominent levels of an oppositional coping style and a better relationship will show better adherence than patients with suggestive or prominent levels of an oppositional coping style and a poorer relationship.

H<sub>0</sub>: The level of patient-physician relationship does not affect adherence regardless of level of oppositional coping style.

### Set #3: Problematic Compliance

Hypothesis 6: The sixth hypothesis examines the main effect for problematic compliance on adherence. Specifically, it is hypothesized that patients with scores falling within the prominent range on problematic compliance will show significantly lower adherence than patients with scores in the non-problematic compliance range. It is also hypothesized that patients with scores within the suggestive range will have better adherence than patients within the prominent range but less adherence than non-problematic compliant patients.

H<sub>1</sub>: The greater the level of problematic compliance the lower the adherence.

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Ho: There is no difference in adherence level among non-problematically complaint patients, patients with scores falling within the suggestive range, and patients with scores falling within the prominent range on the problematic compliance scale.

Rationale: Research indicates that medical patients who score high on this scale of the MBMD possess behavioral and attitudinal qualities that complicate treatment efficacy.

Hypothesis 7: The seventh hypothesis examines the interaction effect for problematic compliance and the relationship. Specifically, it is hypothesized that if the patient has suggestive or prominent levels of prominent compliance and a poorer relationship, he/she will show worse adherence as compared with a patient with suggestive or prominent levels of problematic compliance with a better relationship or with a non-problematic compliant patient (regardless of relationship).

H<sub>1</sub>: Patients with suggestive or prominent levels of problematic compliance and a better relationship will show better adherence than patients with suggestive or prominent levels of problematic compliance and a poorer relationship.

Ho: The level of patient-physician relationship does not affect adherence regardless of level of problematic compliance.

Exploratory hypotheses:

Hypothesis 8: The eighth hypothesis examines the main effect of the physician's own level of satisfaction on patient adherence. Specifically, it is hypothesized that the greater the level of the physician's satisfaction, the better the patient's adherence.

H<sub>1</sub>: The higher the physician's level of satisfaction, the better the patient's adherence.

Ho: The level of the physician's satisfaction does not affect adherence.

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Rationale: Research suggests that better satisfaction in physicians is correlated with better adherence in patients.

Hypothesis 9: The ninth hypothesis examines the correlation between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction (independent of adherence). In other words, it examines whether or not the physician can tell if the patient is satisfied.

H<sub>1</sub>: There is a positive correlation between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction.

H<sub>0</sub>: There is no correlation between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction.

Hypothesis 10: The tenth hypothesis examines whether or not better symmetry between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction predicts better patient-reported adherence.

H<sub>1</sub>: Better symmetry between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction predicts better patient-reported adherence.

H<sub>0</sub>: Symmetry between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction does not predict better patient-reported adherence.

Hypothesis 11: The eleventh hypothesis examines the correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician (independent of adherence).

H<sub>1</sub>: There is a positive correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician

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Ho: There is no correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician.

Hypothesis 12: The twelfth hypothesis examines whether or not a positive correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician predicts better adherence.

H<sub>1</sub>: A positive correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician predicts better adherence.

Ho: A positive correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician does not predict better adherence.

Hypothesis 13: The thirteenth hypothesis examines the correlation between the patient's report of adherence behaviors and the physician's report of the patient's level of adherence, because research indicates that physicians overestimate patients' adherence.

H<sub>1</sub>: There will be no correlation between the patient's report of adherence behaviors and the physician's report of the patient's level of adherence.

Ho: There will be a positive correlation between the patient's report of adherence behaviors and the physician's report of the patient's level of adherence.



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## Chapter Four: Methods

### Overview

This study seeks to examine whether or not a better quality of the patient-physician relationship is associated with better adherence despite the presence of negative predictors of adherence for patients with chronic illness in the primary care setting. Specifically, the objectives of this study are to examine the effect of depression on medical adherence, the effect of the patient-physician relationship on medical adherence, and if a better patient-physician relationship moderates the influences of depression on medical adherence. In addition, it will examine the effect of an oppositional coping style on medical adherence, and if a better patient-physician relationship moderates the influence of an oppositional coping style on medical adherence. Further, it will examine the effect of characteristics consistent with a problematic compliant style on medical adherence, and if a better patient-physician relationship moderates the influences of these attitudinal and behavioral characteristics. Information gleaned from the patient's perspective related to the quality of the patient-physician relationship and level of adherence will be used to test these main hypotheses.

Exploratory hypotheses will also examine the correlation between the physician's level of satisfaction and the patient's level of adherence, the patient's level of satisfaction and the physician's view of the patient's level of satisfaction (independent of adherence), and if better symmetry on ratings of satisfaction predict better adherence. In addition, exploratory hypotheses will examine the correlation between the amount of trust reported by the patient with the amount of trust reported by the physician (independent of adherence); if greater symmetry on the trust variable predicts better adherence, and the

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correlation between the patient's report of adherence behaviors and the physician's report of the patient's adherence behaviors. Information gleaned from both the patient's and physician's perspectives related to the quality of the patient-physician relationship and level of adherence will be used to test the exploratory hypotheses.

### Design and Design Justification

The independent variable "quality of the patient-physician relationship" will be quantified using two components of the patient's version of the qualitative questionnaire, i.e., level of trust in the relationship and satisfaction with medical services. The quality of the patient-physician relationship will be coded into three levels, "low, medium, and high". "Low, medium and high" categories will be determined by analyzing responses to the (open-ended) trust and satisfaction questions. Responses deemed suggestive of a "low" level of trust will be assigned a value of "1"; responses deemed suggestive of a "medium" level of trust will be assigned a value of "2", and responses deemed suggestive of a "high" level of trust will be assigned a value of "3". Similarly, responses indicative of a "low" level of satisfaction will be assigned a value of "1"; responses deemed indicative of a "medium" level of satisfaction will be assigned a value of "2", and responses deemed indicative of a "high" level of satisfaction will be assigned a value of "3". Scores from these two questions will then added to establish the three levels of the relationship; possible total scores will therefore range from "2" to "6". A "low relationship" will be operationally defined as a total score of 2 or 3; a "medium relationship" will be operationally defined as a total score of 4 or 5, and a "high relationship" will be operationally defined as a total score of 6.

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The independent variable “Depression”, “Oppositional Coping Style” and “Problematic Compliance” will be operationally defined along three levels, using prevalence scores obtained on the Million Behavioral Medicine Diagnostic (MBMD). On the MBMD, Prevalence Scores (PS) of 74 or below are not sufficiently indicative of a scale’s symptom pathology (Millon et al., 2001) and therefore this range will operationally define the absence of the clinical scale (e.g. non-depressed, non-oppositional and non-problematic compliant). Because PS of 75 to 84 (inclusive) on the MBMD more closely suggest the presence of the disorder associated with the scale, scores falling within this range will operationally define a “suggestive” level of the characteristic. Prevalence scores of 85 and above provide strong support for the prominence of the pathological problem (Millon et al., 2001); this range will therefore characterize the “prominent” level of the characteristic.

As previously discussed, the dependent variable “level of adherence” will be determined by analyzing responses to three questions in the “Behavioral Measures of Adherence” section of the intake evaluation of the larger study. A value of “1” will be assigned to “no” responses and a value of “2” will be assigned to “yes” responses. Total scores from the three questions will therefore range from 3 to 6.

To address potential validity and reliability concerns specific to quantifying the level of the relationship, the investigator will then write a manual operationally defining “low, medium and high” relationship levels and include examples from the analyzed responses. Twenty per cent of the coded relationship responses will be sampled, and a second doctoral-level colleague will re-analyze the responses to determine level of agreement, with an expected correlation of 80-90%. Therefore, if 60 individuals’

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responses are obtained, the second coder will analyze 12 responses to ensure 80-90% agreement.

After sufficient agreement for the level of the relationship is obtained, one-way ANOVAs will be performed for all main effect hypotheses. 3 X 3 ANOVAS will be performed for interaction effect hypotheses. Pearson's  $r$  will be used for hypotheses examining correlations. Finally, regression will be used for hypotheses examining whether or not better symmetry (e.g. on trust) predicts better adherence.

### Overview of the larger study

This is a between subjects, cross-sectional, case-control design. The results are correlational because all of the measures are obtained at the same time. All data for this study were drawn from archival data of the "A Healthier You" wellness program. The "A Healthier You" program was designed to serve the underserved patients of the healthcare centers operated by the Philadelphia College of Osteopathic Medicine Medical School. It was developed to address medical non adherence in chronically-ill patients, using an evidenced-based treatment for chronic illness (cognitive behavioral treatment). It is a complement to the already established free psychological services provided by master's and doctoral-level PCOM psychology students in these healthcare centers. Initial outcome measures used in the "A Healthier You" wellness program include a qualitative questionnaire. Patient responses to these questions will be used to quantify the patient-physician relationship for the main hypotheses. Analysis of the physician's responses to these questions will be used to examine the exploratory hypotheses. The qualitative questionnaire also includes three behavioral (yes/no) questions designed to measure the patient's level of adherence.

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### Recruitment

All initial screening and intake procedures were performed by Deborah Chiumento, Psy.D. Participants were recruited in a several ways. Posters were put up in the common areas of PCOM's administrative buildings, and potential participants contacted the lead coordinator if they were interested in becoming part of a program called *A Healthier You*, designed to help them live healthier lives. Posters were also posted in the common areas of PCOM's healthcare centers. In addition, primary care physicians in PCOM's healthcare clinics referred patients with chronic illnesses whom they judged to be possible candidates for the wellness program. The clinics are staffed by family physicians employed by PCOM. Data collecting for the *A Healthier You* wellness program started in October 2008.

### Screening Procedures

Individuals could self-refer by contacting Dr. Chiumento directly, or be referred through their PCOM physician (all participants, regardless of manner of referral, were patients of PCOM primary care physicians). The physician completed the physician's version of the qualitative and behavioral questionnaire as part of the referral protocol at the time he/she deemed a patient appropriate to refer to the Wellness program. In phase one, all prospective participants were screened during a 20 minute phone triage either by the lead coordinator for the wellness program, Dr. Deborah Chiumento, or by a graduate assistant, a practicum student, or a doctoral intern. In phase two, participants deemed appropriate for the program completed a 1 ½ hour intake evaluation with Dr. Chiumento that included the patient's version of the qualitative and behavioral measures, the Million Behavioral Medicine Diagnostic (MBMD), a semi-structured diagnostic interview

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clinical interview, and all legal paperwork (including informed consent); other measures were also given in the parent program but were not examined for this study. Responses to the patient's version of the qualitative and behavioral measures were written verbatim after Dr. Chiumento read the qualitative and behavioral adherence questions to each participant or were written by the patient after he/she was handed the questionnaire. Some of the data collected were intended to be used qualitatively in the parent study, but were coded numerically and used quantitatively for the purposes of this protocol. Assessments were performed at one of the four PCOM healthcare centers.

### Inclusion and Exclusion Criteria

Self-referred and primary care physician-referred patients of Philadelphia College of Osteopathic Medicine's Healthcare Centers with at least one diagnosed chronic illness are considered eligible. Participants must be eighteen years or older and able to read and write at an eighth grade reading level. Participants with active suicidal or homicidal ideation and deemed to be a risk to themselves or others are excluded from the study (and referred to psychological services as appropriate). Participants with past suicidal or homicidal ideation or attempts are not excluded, nor are patients with passive suicidal ideation. Participants with active psychosis and cognitive impairment are excluded, as are employees or students of PCOM. Patients of specialist physicians (cardiologists, obstetrician-gynecologists, etc.) are not eligible unless they are also patients of a Philadelphia College of Osteopathic Medicine Healthcare Center primary care physician.

### Measures

The physician's version of the qualitative measure is outlined in Table 1; the participant's version of the qualitative measure is outlined in Table 2.

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### Procedures for Maintaining Confidentiality

Copies of all referrals made to “A Healthier You” will be kept in the medical charts of patients of the PCOM’s Healthcare Centers. All charts will be kept secure in locked cabinets designated solely for the purpose of the larger study and will be located within Dr. Chiumento’s office in PCOM’s administrative building. The SPPS database containing clinical information will not include the participants’ identifying information.

### Potential Benefits to Others

Because this study utilizes archival data, there are neither potential risks nor potential benefits to participants. The possible benefits to others are potentially substantial, given the economic and personal costs related to poor adherence, and the rising rates of individuals living with chronic illnesses.

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## Chapter Five: Results

This study sought to examine whether or not the quality of the patient-physician relationship would moderate predictors of poor adherence in urban, underserved and vulnerable patients with chronic illness. Specifically, the objectives of this study were to examine the effect of depression on medical adherence, the effect of the patient-physician relationship on medical adherence, and whether or not a better patient-physician relationship moderates the influences of depression on medical adherence. In addition, it sought to examine the effect of an oppositional coping style on medical adherence, and if a better patient-physician relationship moderates the influence of an oppositional coping style on medical adherence. Last, it sought to examine the effect of characteristics consistent with a problematic compliant style on medical adherence, and whether or not a better patient-physician relationship moderates the influences of these attitudinal and behavioral characteristics. One-way ANOVAs were to be used for all main effect hypotheses; for example, to assess whether or not “prominently” depressed patients showed significantly lower adherence scores, compared with non-depressed patients. 3 x 3 ANOVAs were to be used for all interaction effect hypotheses; for example, to assess if patients with “suggestive” or “prominent” levels of depression and a poorer relationship demonstrated worse adherence compared with patients with “suggestive” or “prominent” levels of depression with a better relationship or a non-depressed patients (regardless of relationship).

To examine the relationship of depression, an oppositional coping style and problematic compliance to adherence, participants were divided into one of three levels based on prevalence score ranges on the MBMD. Prevalence scores of 74 or below



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operationally defined the category reflecting the absence of the clinical scale (e.g. non-depressed, non-oppositional and non-problematic compliant). Prevalence scores between 75 and 84 operationally defined the category reflecting the suggestive range of the clinical scale. Prevalence scores of 85 and above operationally defined the category reflecting the prominent range of the clinical scale.

To examine the association between the quality of the patient-physician relationship and medical adherence, patients were divided into three groups categorized by the level of perceived quality of the patient-physician relationship based on patient's responses to questions completed at intake as part of the larger study: "low" relationship quality, "medium" relationship quality, and "high" relationship quality. The "relationship" was quantified using two components of the qualitative questionnaire, i.e., "level of trust in the relationship" and "satisfaction with medical services". Responses deemed suggestive of a "low" level of trust was assigned a value of "1"; responses deemed suggestive of a "medium" level of trust was assigned a value of "2", and responses deemed suggestive of a "high" level of trust was assigned a value of "3". Similarly, responses indicative of a "low" level of satisfaction was assigned a value of "1"; responses deemed indicative of a "medium" level of satisfaction was assigned a value of "2", and responses deemed indicative of a "high" level of satisfaction was assigned a value of "3". Scores from these 2 questions were then be added to establish the 3 levels of the relationship, with total scores ranging from 2 to 6. A "low relationship" was operationally defined as a total score of 2 or 3; a "medium relationship" was operationally defined as a total score of 4 or 5, and a "high relationship" was operationally defined as a total score of 6.

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Last, patients' levels of adherence to medical regimes was examined as a continuous variable based on participants' responses to three questions in the "Behavioral Measures of Adherence" portion of the intake evaluation of the larger study. A value of "1" was assigned to "no" responses and a value of "2" was assigned to "yes" responses. Total scores from these three questions therefore ranged from 3 to 6.

In addition to the main hypotheses, exploratory hypotheses examined the correlation between the physician's level of satisfaction and the patient's level of adherence; the patient's level of satisfaction and the physician's view of the patient's level of satisfaction (independent of adherence), and whether or not better symmetry on ratings of satisfaction predict better adherence. Exploratory hypotheses also examined the correlation between the amount of trust reported by the patient with the amount of trust reported by the physician (independent of adherence), whether or not greater symmetry on the trust variable predicts better adherence, and the correlation between the patient's report of adherence behaviors and the physician's report of the patient's adherence behaviors. Pearson's  $r$  was used for hypotheses examining correlations, and regression was used for hypotheses examining whether or not better symmetry (e.g. on trust) predicts better adherence.

Before proceeding with statistical analyses of the obtained data, a second doctoral-level rater was employed to address potential validity and reliability concerns specific to quantifying the level of the relationship. The investigator wrote a manual operationally defining "low, medium and high" relationship levels, using some examples gleaned from participant responses. Because there were 56 total participants in this study, 12 sets of responses were randomly selected for coding by the second rater using

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an online statistical random sampling program. Each set included 5 responses; each rater therefore coded a total of 60 responses. This resulted in 4 discrepant codings, yielding an agreement of 93.33%.

The statistical test ANOVA was intended to analyze whether or not greater levels of depression, an oppositional coping style, and problematic compliance in the patient would be associated with lower levels of patient-reported adherence. In addition, the statistical test ANOVA was intended to analyze whether or not a lower quality of the patient-physician would be associated with lower levels of patient-reported adherence. Last, the statistical test ANOVA was intended to analyze whether or not greater levels of the physician's own level of satisfaction with the patient-physician relationship would be associated with greater satisfaction with the patient-physician relationship as reported by the patient. However, these analyses could not be performed because the adherence variable data demonstrated inadequate variability and was not homoscedastic; in other words, it violated the assumption of homogeneity of variance (see Table 3.)

The first hypothesis sought to examine the main effect for depression on adherence. Specifically, the author hypothesized that the greater the level of depression the lower the (patient reported) level of adherence. However, ANOVA could not be performed because the adherence variable data violated homoscedasticity; in other words, it violated the assumption of homogeneity of variance. Additionally, visual inspection failed to depict a relationship between the level of the patient's depression and the patient reported level of adherence (see Figure 1).

The second hypothesis sought to examine the main effect for relationship. Specifically, the author hypothesized that the higher the (patient reported) level of the

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quality of the relationship with the physician, the better the patient reported level of adherence. However, ANOVA could not be performed because the adherence variable data demonstrated inadequate variability. In addition, visual inspection of the data failed to depict a relationship between patient reported quality of the patient-physician relationship and the patient reported level of adherence (see Table 4).

The third hypothesis sought to examine the interaction effect for depression and the relationship. Specifically, the author hypothesized that if the patient had suggestive or prominent levels of depression and a poorer relationship with the physician, he/she would show worse adherence as compared with a patient with suggestive or prominent levels of depression with a better relationship or a non-depressed patient (regardless of relationship). Again, the statistical test (3 x 3 ANOVA) could not be performed as planned because the adherence variable demonstrated inadequate variability. Visual inspection of the data also failed to depict a relationship between levels of depression, patient reported quality of the relationship with the physician, and patient reported level of adherence (see Figure 2).

The fourth hypothesis sought to examine the main effect of an oppositional coping style on adherence. Specifically, the author hypothesized that the greater the level of oppositional coping style, the lower the patient reported level of adherence. However, ANOVA could not be performed because the adherence variable data demonstrated inadequate variability. Visual inspection also failed to depict a relationship between the level of the patient's Oppositional Coping Style and the patient reported level of adherence (see Figure 3).

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The fifth hypothesis sought to examine the interaction effect for Oppositional Coping Style and the quality of the patient-physician relationship as reported by the patient. Specifically, the author hypothesized that if the patient has suggestive or prominent levels of an Oppositional Coping Style and a poorer relationship, he/she would show worse adherence, as compared with a patient with Suggestive or Prominent levels of an oppositional coping style with a better relationship or a non-oppositional patient (regardless of relationship). The statistical test (3 x 3 ANOVA) could not be performed as planned because the adherence variable data demonstrated inadequate variability. In addition, visual inspection of the data failed to depict a relationship between levels of oppositional coping style, patient reported quality of the relationship with the physician, and patient reported level of adherence (see Figure 4).

The sixth hypothesis sought to examine the main effect for problematic compliance on adherence. Specifically, the author hypothesized that the greater the level of problematic compliance the lower the adherence. Again, however, ANOVA could not be performed because the adherence variable data demonstrated inadequate variability and violated the assumption of homogeneity of variance. Additionally, visual inspection failed to depict a relationship between the level of the patient's problematic compliance and the patient reported level of adherence (see Figure 5).

The seventh hypothesis sought to examine the interaction effect for problematic compliance and the relationship. Specifically, the author hypothesized that if the patient has suggestive or prominent levels of prominent compliance and a poorer patient-physician relationship, he/she would show worse adherence as compared with a patient with suggestive or prominent levels of problematic compliance with a better relationship

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or a non-problematic compliant patient (regardless of relationship). The statistical test (3 x 3 ANOVA) could not be performed as planned because the adherence variable data demonstrated inadequate variability and violated the assumption of homogeneity of variance. Visual inspection of the data also failed to depict a relationship between levels of problematic compliance, the patient-reported quality of the relationship with the physician, and patient reported level of adherence (see Figure 6).

The eighth hypothesis sought to examine the main effect of the physician's own level of satisfaction on patient adherence. Specifically, the author hypothesized that the greater the level of the physician's own satisfaction with the patient-physician relationship, the better the patient's adherence (as reported by the patient). However, ANOVA could not be performed because the adherence variable data demonstrated inadequate variability and violated the assumption of homogeneity of variance. Visual inspection also failed to depict a relation between the level of the physician's own satisfaction with the patient-physician relationship and the patient reported level of adherence (see Table 5).

The ninth hypothesis sought to examine the correlation between the patient's level of satisfaction with medical services and the physician's belief about the patient's level of satisfaction with medical services (independent of adherence). This hypothesis postulated that there would be a positive correlation between the patient's level of satisfaction and the physician's belief about the patient's level of satisfaction. The analysis failed to support the hypothesis ( $r = .125$ ,  $n = 50$ ,  $p < ns$ , two tails). Visual inspection also failed to depict a relation between the patient's level of satisfaction with

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medical services and the physician's belief about the patient's level of satisfaction with medical services (see Table 6).

The tenth hypothesis sought to examine whether or not better symmetry between the patient's level of satisfaction with medical services and the physician's belief about the patient's level of satisfaction predicts better patient reported adherence. However, regression analysis was unable to be performed because the adherence data demonstrated inadequate variability and violated the assumptions of the statistical test. Additionally, visual inspection failed to depict a relationship between the patient's level of satisfaction with medical services and the physician's belief about the patient's level of satisfaction with medical services, and patient reported level of adherence (see Figure 7).

The eleventh hypothesis sought to examine the correlation between the amount of trust that exists between the patient and physician as reported by the patient and the amount of trust that exists as reported by the physician; the hypothesis postulated that there would be a positive correlation between these two variables. The analysis failed to support this hypothesis ( $r = .078$ ,  $n = 49$ ,  $p < ns$ , two tails). Visual inspection also failed to depict a relationship between the amount of trust that exists between the patient and physician as reported by the patient and the amount of trust that exists as reported by the physician (see Table 7).

The twelfth hypothesis sought to examine whether or not a positive correlation between the amount of trust that exists between the patient and the physician as reported by the patient and the amount of trust that exists as reported by the physician predicts better adherence. However, regression analysis was unable to be performed because the adherence data demonstrated inadequate variability and violated the assumptions of the

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statistical test. Visual inspection also failed to depict a relationship between the amount of trust that exists between the patient and the physician, as reported by the patient, the amount of trust that exists as reported by the physician, and the patient's reports of level of adherence (see Figure 8).

The last (thirteenth) hypothesis sought to examine the correlation between the patient's report of adherence and the physician's report of the patient's adherence. Again, statistical analysis of this hypothesis could not be performed because the data demonstrated inadequate variability and violated the homogeneity of variance assumption. Further, visual inspection failed to depict a relation between the patient's report of adherence and the physician's report of the patient's adherence (see Tables 3 and 8).

Interestingly, visual inspection revealed not a single instance in which a patient or physician reported non adherence to an individual adherence question which was in agreement with the other responder to the same question. To summarize, of the 50 patients who responded to the three adherence questions, 78.6% (n = 40) of patients responded "yes" on all three questions (affirming complete adherence), and 83.9 % (n = 47) of physicians responded in like manner. In addition, 8.9% (n = 5) of patients responded "yes" to two of the three questions, reflective of a medium level of adherence, but 1.8 % (one physician), responded in like manner. Last, only one patient and one physician, or 1.8 %, responded in a manner reflective of lower adherence, because they endorsed only one positive response to the three adherence questions. No patients or physicians responded in a manner reflective of complete non-adherence (or "no" to all three questions).



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Additional analyses do demonstrate some interesting findings beyond those suggested by the main and exploratory hypotheses. For example, analysis of the data supports a significant, negative relationship between MBMD Depression rating and the physician's belief about the patient's level of satisfaction with medical services; this occurs when Depression is considered as a continuous variable ( $r = -.483$ ,  $n = 50$ ,  $p < .01$ , one tail) and also when divided into the 3 clinical ranges of the MBMD ( $r = -.337$ ,  $n = 50$ ,  $p < .05$ , two tails). These results suggest that the greater the level of depression, the lower the physician's rating of the patient's level of satisfaction with medical services (see Table 9).

Similarly, analysis of the data supports a significant, negative relationship between MBMD Oppositional Coping Style rating and the physician's belief about the patient's level of satisfaction with medical services ( $r = -.396$ ,  $n = 50$ ,  $p < .01$ , two tails) when this variable is examined as a continuous variable. Thus it would appear that the greater the level of Oppositional Coping, the lower the physician-rated patient level of satisfaction with medical services. In fact, visual inspection of the data reveals that of the 10 patients falling within either the "Suggestive" or "Prominent" range of Oppositional Coping Style, only one was rated as "highly" satisfied with medical services by his/her physician. This relationship was not significant when Oppositional Coping was examined on 3 levels rather than as a continuous variable (See Table 10).

Interestingly, and in contrast to the data supporting a negative correlation between MBMD Oppositional Coping Style rating and the physician's belief about the patient's level of satisfaction with medical services, the analysis failed to support a relationship between MBMD Oppositional Coping Style rating and the patient's report of their level

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of satisfaction ( $r = .090$ ,  $n = 56$ ,  $p < ns$ , two tails) when examined both as a continuous variable and when examined in three levels. Visual inspection also failed to depict a relation between MBMD Oppositional Coping Style rating and satisfaction with medical services as reported by the patient (see Figure 9).

Analysis of the data does support a significant, negative correlation between age and MBMD Depression rating ( $r = -.397$ ,  $n = 56$ ,  $p < 0.01$ , two tails) when Depression is examined as a continuous variable. Although this relationship is not significant when the depression level is categorized as falling within the Suggestive or Prominent range for Depression, visual inspection of the data did depict a relationship between younger age and greater depression rating on the MBMD in this sample (see Table 11, Figure 10).

Analysis of the data also supports a significant, negative correlation between age and an Oppositional Coping Style ( $r = -.290$ ,  $n = 56$ ,  $p < 0.05$ , two tails) when Oppositional Coping Style is examined as a continuous variable. While this sample is not reflective of high levels of Oppositional Coping, visual inspection of the data does support this trend (see Table 12, Figure 11). However, when Oppositional Coping Style was examined on 3 levels, the data failed to depict this relation.

Analysis of the data supports a significant positive correlation between MBMD Depression rating and the MBMD Oppositional Coping Style rating ( $r = .699$ ;  $n = 56$ ,  $p < 0.01$ , two tails) when analyzed as a continuous variable. This correlation was also significant when these variables were examined as falling within the three MBMD clinical levels for Depression and Oppositional Coping (see Table 13). Additionally, visual inspection depicts a positive relation between level of Depression and level of Oppositional Coping Style (see Figure 12). These results suggest that an elevated score

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on one clinical scale is associated with an elevated score on the other clinical scale. Of the fifty-six participants, slightly less than 10%, ( $n = 6$ ) of participants had MBMD scores falling within the Suggestive or Prominent levels in both clinical categories.

Results of the data suggested important findings between trust and both the patient's level and also the physician's level of satisfaction in the relationship. Specifically, analysis of the data supports a significant, positive correlation between the physician's rating of the amount of trust that exists in the relationship and the physician's belief about the patient's level of satisfaction with medical services and ( $r = .445$ ,  $n = 48$ ,  $p < 0.01$ , two tails). These results suggest that a higher trust rating reported by the physician is associated with a belief in higher patient satisfaction with medical services, as reported by the physician. In addition, analysis supports a significant, positive correlation between the physician's own level of satisfaction with the patient-physician relationship and the physician's rating of the amount of trust that exists ( $r = .730$ ,  $n = 44$ ,  $p < 0.01$ , two tails), suggesting that higher trust in the patient-physician relationship reported by the physician is associated with higher satisfaction with the relationship for the physician.

Moreover, analysis of the data supports a significant positive correlation between the amount of trust, as rated by the patient and the quality of the patient-physician relationship as rated by the patient ( $r = .733$ ;  $n = 55$ ,  $p < 0.01$ , two tails); these results that support research suggesting that trust is an essential component of the patient-physician relationship. Last, analysis of the data supports a significant positive relation between satisfaction, as rated by the patient and the quality of the relationship with the physician, as rated by the patient ( $r = .685$ ;  $n = 55$ ,  $p < 0.01$ , two tails). These results are also

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consistent with research that suggests satisfaction is an essential component of the patient-physician relationship.

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## Chapter Six: Discussion

This study sought to build on previous research suggesting that a higher quality of the relationship between the patient and primary care physician positively impacts the patient's adherence to medical recommendations for chronic illnesses. Although there is a significant amount of research supporting specific negative predictors of adherence, such as depression, research has not yet established whether or not a better relationship can moderate the impact of these negative predictors. This study therefore sought to bridge this gap in the literature.

### Limitations of the Current Study

Although the use of archival data is considered underutilized in the field of psychology by some researchers, it does have inherent disadvantages- including issues related to the quality of the data (Shultz, Hoffman, & Reiter-Palmon, 2005). In this study it was impossible to adequately test many of the study's original hypotheses adequately because of inherent limitations of the data. Most prominently, there was insufficient variability in reported adherence across subjects (i.e., 78% of the participants reported complete adherence). As described previously, the adherence variable was composed of three patient-reported adherence items (usually keeping appointments, usually filling prescription, and usually obtaining diagnostic tests when ordered). Because patient-reported adherence was the major dependent variable for this study, inadequate variability negated the ability of the researcher to examine properly all main hypotheses and all but two exploratory hypotheses. Specifically, the researcher could not examine the main effect for depression, patient-reported quality of the patient-physician relationship, oppositional coping style, problematic compliance, and the physician's

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own level of satisfaction with the patient-physician relationship on patient-reported adherence (hypotheses 1, 2, 4, 6, and 8). Additionally, inadequate variability invalidated the ability to examine an interaction effect between established negative predictors of adherence (depression, oppositional coping style, and problematic compliance) and the quality of the relationship on patient-reported adherence (hypotheses 3, 5, and 7). Last, insufficient variability prevented the researcher from examining whether or not better symmetry between patient level of satisfaction with medical services and the physician's belief about the patient's level of satisfaction predicts better patient-reported adherence (hypothesis 10), whether or not a positive correlation between the patient and physician-reported amount of trust predicts better patient-reported adherence (hypotheses 12), and the correlation between the patient's report of adherence behaviors and the physician's report of the patient's level of adherence (hypothesis 13).

### Factors Contributing to Data Limitations

Further examination of the questions comprising the adherence variable is warranted in order to understand factors potentially contributing to the limitations of the data. One significant factor (affecting all of the questions used in the larger study from which the data from this study were drawn) is that this study's questionnaire items were not piloted or validated prior to use in the parent study, and no parametric data are available. Thus, the reliability and internal consistency of the items remain to be established. Additionally, neither patients nor physicians were trained before being asked to respond. Further, the wording, the limited number of possible responses, and the limited numbers of questions that comprised the variable are potentially problematic. Specifically, inclusion of the word "usually" in each of the three behavioral adherence

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questions allows for subjective interpretation of what “usually” means, which brings into question the validity and reliability of the responses across respondents. Second, the use of a self-report forced-choice (yes/no) response constricts the range of responses from the onset, and cannot be translated into more specific and graded behaviors, reflective of such a complex variable as adherence (Schneider et al., 2004). The use of self-report also carries the risk of response bias, or the tendency of patients to want to appear as “good” patients, thereby perhaps inhibiting fuller and more honest disclosure. Third, the limited number of questions comprising the variable may make it more vulnerable to poor variability simply because of the limited range of possible response sets.

Notably, the problem of measuring adherence has been discussed at length. A recent meta-analytic review of the relationship of adherence to clinical outcomes revealed that the method of measuring adherence was the largest source of variance in the relationship between adherence and outcomes (DiMatteo et al., 2002). Further, although it cannot be determined because of inadequate variability, it is interesting that the high level of physician-reported patient adherence (95.9%) may in fact simply mimic the tendency of physicians to overestimate patient adherence (Paterson, Swindells, Mohrs, Brester, Vergis, Squier, et al., 2000; Liu, Golin, Miller, et al., 2001). Future analyses of the association between patient-physician relationship quality and adherence would profit from adding objective measures of adherence (Schneider et al., 2004).

### Summary of the Findings

*Correlation Between Patient’s Level of Satisfaction and Physician’s Belief about the Patient’s Level of Satisfaction*

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Although some of the original hypotheses were not able to be tested adequately, results from the ninth and eleventh hypotheses did suggest some important findings. For example, results of the ninth hypothesis (examining the correlation between the patient's level of satisfaction with medical services and the physician's belief about the patient's level of satisfaction) failed to depict a relationship between these two variables, suggesting that the physician cannot tell if his/her patient is satisfied. This discrepancy in perception is important because satisfaction with medical services has been demonstrated to impact the patient-physician relationship and also adherence to medical recommendations. Further, because patient dissatisfaction with medical services is significantly associated with voluntarily switching physicians (Safra et al., 2001), this may also lead to disruption of care.

### Significance of the Findings

#### *Factors Contributing to the Discrepancy between Patient and Physician Reported Level of Patient Satisfaction with Medical Services*

This discrepancy in perception of patient satisfaction with medical services as reported by the patient and the physician's *belief* about the patient's level of satisfaction may be due to several factors. Such factors include differing expectations between the patient and physician about what constitutes satisfactory medical services, because expectations are affected by factors including one's culture, socio-economic status and previous experiences (Garson, Yong, Yock, & McClellan, 2006). This incongruity may also be due to discrepant "fit" between patient preferences for physician behaviors (e.g. decision-making style and consideration of patient's religion) and physicians' preferences of their own behaviors, because research suggests that patients who differed more from



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their physicians in preference for physician decision-making reported less satisfaction with their physicians (Schwartz et al., 2006). Last, this observed incongruity may be a reflection of the question itself and how this was interpreted both by patient and physician, suggesting that the wording of the question may be too broad. It is notable that patients' individual responses to the single-item question regarding satisfaction with medical services often mentioned problems with front-office staff, yet acknowledged a more positive assessment of individual physicians; it is therefore likely that the results were affected by the individual's definition of what it is that constitutes "medical services", and the inability of the analyses to discriminate among factors such as satisfaction with the physician, satisfaction with front-office staff, and/or satisfaction with medical treatment. Regardless of the origin of the discrepancy in perception, it suggests an opportunity for psychologists to intervene both at the relationship level and in the wider healthcare environment, a focus consistent with the biopsychosocial approach already discussed.

Further, this study did not identify new patients, the length of relationship with the doctor, or the frequency of seeing different doctors within the practice - all of this information is likely to influence satisfaction. Last, it is possible that responses of both patients and of physicians represent a more global attitude regarding physicians and medical care in general rather than truly independent measures (Schneider et al., 2004). For instance, previous research has identified mistrust and dissatisfaction with the U. S. healthcare system among African-Americans (Smedley, Stith & Nelson, 2002). Future research should therefore seek to identify further how culturally-influenced global beliefs about healthcare impacts satisfaction at the local level, because these beliefs may

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influence adherence behaviors differently across diverse patient populations and may therefore suggest potential changes in both assessment and intervention strategies.

### *Correlation between Patient and Physician Reported Trust in the Relationship*

Results of this study also failed to confirm a relation between the amount of trust that exists between the patient and physician, as reported by the patient and the amount of trust that exists, as reported by the physician; in fact, only 34% of the 50 cases reflected concordant responses. Interestingly, 28 patients, or 56% of participants, reported high trust in the relationship, while 38%, or 19 physicians, reported high levels of trust. Factors that may be related to this result include those already mentioned in relation to the previous hypothesis regarding the correlation between patient and physician perspectives on the patient's satisfaction with medical services.

### *Secondary Findings*

As mentioned, secondary analyses did yield provocative results. For example, the results suggested a significant negative relationship between MBMD Depression rating and the physician's belief about the patient's level of satisfaction. This suggests that as the patient's level of depression increases, he or she is perceived to be less satisfied with medical services (as rated by the physician). This may reflect the physician's perspective that the more seriously depressed patient is likely to be less satisfied with life in general, and more specifically, healthcare providers and the healthcare environment. This finding is consistent with research linking depressive disorders to decreased satisfaction with medical services (Webster et al., 2001). This may also suggest that from a physician's perspective, targeting depression will likely influence patient satisfaction with medical services, thereby improving the patient-physician relationship and subsequent adherence.

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However, this correlation was not significant from the patient's perspective, and therefore future research should seek to clarify this result and its subsequent interpretation.

The findings also supported a significant negative relation between MBMD Oppositional Coping Style and the physician's belief about the patient's level of satisfaction with medical services (when examined as a continuous variable). This suggests that as the patient's level of Oppositional Coping Style increases, he or she is perceived by the physician as being less satisfied with medical services. Because high scorers on this scale are often viewed by their medical providers as unhappy and dissatisfied with their physical health, and can be unpredictable and inconsistent in following medical recommendations, this result appears consistent with the MBMD's author's objective for this MBMD scale. According to the MBMD manual, item responses endorsed from this scale include "When people are bossy, I usually do the opposite of what they want" and "I often resent doing things other expect of me". This suggests that it may be beneficial to provide psychological counseling for patients with elevations on this scale, targeting this coping style by an incorporation of strategies meant to increase the patient's awareness, thereby broadening his/her range of coping. It may also suggest that primary care physicians tailor their interventions with consideration for this style, and approach these patients in a more collaborative, and less directive, manner. However, this correlation was also not significant from the patient's perspective, and therefore future research would be necessary to clarify this result.

Results did depict a negative correlation between age and MBMD Depression rating (as a continuous variable), suggesting that a younger age is associated with greater depression ratings on the MBMD in this sample. This finding is inconsistent with

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previous research, and may be a result of characteristics specific to the participants in this study. Because these participants were patients of a healthcare clinic in an urban, primarily disadvantaged area from a lower socio-economic status, it is possible that these patients may carry a greater “illness burden”, so younger participants may have multiple chronic illnesses. This correlation suggests that depression screening for all patients with chronic illness (regardless of age) is essential. The benefits of identifying and treating depression in younger patients extend beyond the patients themselves, and include potential, improved healthcare utilization for infants, because maternal mood also influences infant medical service usage (Mandl et al., 1999).

It is also important to consider that this finding is contrary to previous research suggesting a positive relation between age and MBMD Depression rating; therefore, it may be a spurious finding, and future research should seek to replicate this result using a similar sample if possible. This relationship was also found between younger age and greater prevalence score on the Oppositional Coping Style Scale, further suggesting that the data reflect sample-specific characteristics.

When one puts aside the possibility that these findings may be reflective of methodological problems, one can consider the results and how these may be indicative of important information about the participants of this study. To summarize, 34% of the participants in this sample had scores reflecting suggestive or prominent levels of depression; this highlights the importance of assessing and treating depression in the primary care setting for patients of all ages because depressed patients are three times as likely to be non-adherent with medical treatment recommendations overall (DiMatteo, Lepper & Croghan, 2000). Almost 18% had scores reflective of an Oppositional Coping

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Style, an important finding, because research suggests that patients meeting criteria for this scale are at risk for nondisclosure of psychosocial dysfunction, emotional distress, and are more likely to be noncompliant with treatment (Cipher, Clifford, & Schumacker, 2002). Last, 9.33% had scores falling within the clinical range for both of these clinical categories. This result suggests that future research should clarify the rate and the impact of concordant depression and an oppositional coping style on a patient's adherence to medical recommendations in the primary care setting so that intervention strategies can be developed and tested. Intervention studies specifically geared toward ethnically diverse younger participants of lower socio-economic status with depression, with a propensity to be oppositional, and with multiple chronic illnesses may yield information vital to improving adherence and health outcomes for this patient population; this focus is especially critical, considering the fact that minorities share a disproportionate burden of chronic illness in the United States.

Analysis of the results also yielded interesting findings about the physician's perspective on trust and satisfaction in the patient-physician relationship. The findings did support a positive relationship between the physician's rating of the amount of trust in the relationship and the physician's belief about the patient's level of satisfaction with medical services, suggesting that physicians perceiving a higher level of trust in the patient-physician relationship also perceive a higher level of patient satisfaction with medical services. The findings also supported a positive correlation between the physician's own level of satisfaction with the patient-physician relationship and the physician's rating of the amount of trust that exists. This suggests that for some physicians, amount of trust and satisfaction are closely linked, findings that are supported

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by previous research. On the other hand, it is possible that physician responses represent a more global positive or negative attitude regarding relationships and medical care in general rather than truly independent measures (Schneider et al., 2004); this “global perspective” may apply to physicians’ perceptions towards individual groups of patients as well. Alternatively, these findings may suggest that the constructs of trust and satisfaction may have been inadequately differentiated in the questionnaire.

Analysis of the results also yielded interesting findings about the patient’s perspective on trust and satisfaction in the patient-physician relationship. As suggested by previous research, results from this study supported a positive correlation between the amount of trust reported by the patient and quality of the patient-physician relationship, a result that underscores trust as an essential component of the patient-physician relationship. Similarly, analysis of the data also supported a positive correlation between satisfaction with medical services as rated by the patient and quality of the patient-physician relationship, a result also consistent with the research literature.

### Summary and Conclusions

Given the importance of improving patient adherence to medical recommendations for chronic illness, the limitations of this study should not diminish the value of research focusing on the quality of the patient-physician relationship and negative predictors of adherence (such as depression) in the primary care setting. Despite its shortcomings, many of the objectives of this study were substantiated. First, the data indicated that 34% of the participants had scores falling within the clinical range for depression, a finding higher than the 25% suggested by research (Brantley, Mehan, & Thomas, 2000), underscoring the importance of assessing these variables at the primary

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care level. Second, the results reflected inconsistencies in perception of trust and satisfaction between patient and physician; this, therefore, suggests an important role for psychologists in the primary care setting, because psychologists are uniquely trained to provide the education and interventions necessary to improve the relationship between patient and primary care physician. Third, the analyses supported the constructs of trust and satisfaction as essential components of the patient-physician relationship, results consistent with previous research. Fourth, this study sought to broaden the understanding of issues specific to underserved populations by drawing its data from patients of healthcare centers from a geographic region with a significant population of ethnic and racial minorities of lower socio-economic status; in fact, 87.5% of the participants were African American, and 89.3% were women, subgroups which have been traditionally underrepresented in medical research. Last, this study sought to contribute to the scientific understanding of the interaction between the patient and his/her environment and its impact on adherence, thereby adding to the knowledge of factors consistent with the biopsychosocial model. As previously mentioned, this approach connects the biological, psychological, interpersonal and social factors into a larger framework of multiple interactive systems which are continuous and reciprocal (Tovian, 2006).

Although the findings from this study are not robust, they do further advocate for the role that psychologists can play in working collaboratively with primary care staff to increase the use of the biopsychosocial approach through education (Biderman, Yeheskel, & Herman, 2005); this is an important matter, considering the discrepancy between the call for greater training on biopsychosocial factors influencing disease and illness (Cuff &

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Vanselow, 2004), and the actual percentage of physicians currently employing the biopsychosocial model in their practices (Astin, Sierpina, Forys, & Clarridge, 2008).

### Future Research

Although it is difficult to draw conclusions because of the idiosyncrasies of the data, the results do highlight several recommendations for future research. Notably, personal communication with Drs. DiTomasso and Chiumento suggests anecdotal improvement on health outcomes for patients enrolled in the wellness program; i.e., evidence supporting the objectives and replication of that protocol. Future research attempting to speak to the goals of this study would benefit from using standardized measurements to assess patient satisfaction and trust; these measures might include ones such as the Primary Care Assessment Survey (PCAS, Safran et al. 1998) and the Trust in Physician Scale (Thom, Ribisi, Stewart & Luke, 1999). In addition, cross-sectional studies are limited because it is not possible to determine definitively whether a poor relationship increases the risk of nonadherence or whether or not physicians of poorly adherent patients behave in a manner that decreases the level of trust and satisfaction (thereby affecting the overall quality of the relationship). Therefore, prospective studies that examine the patient-physician relationship over time and observe changes in adherence and outcomes are strongly needed (Ingersoll & Heckman, 2005). Further, because individuals and physicians hold different beliefs about what constitutes a “satisfactory” and “trusting” relationship, research which seeks to further illuminate how the “fit” between patient and physician affects trust and adherence may prove fruitful, because matching preferences for physician behaviors from both the patient and the physician perspective has been associated with enhanced patient satisfaction (Schwartz,



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Hasnain, Eiser, Lincoln, & Elstein, 2006). Given the fact that one might also find different patterns of adherence behaviors in relationships that are paternalistic, mentoring, collaborative, or autonomous in nature (Balint & Shelton, 1996), and because the management of chronic illness is inherently long term, it would also be interesting to investigate whether or not the relationship between physician and patient follows a developmental trajectory, necessitating ongoing assessment and a tailoring of interventions and approaches. The rising prevalence rates of chronic illnesses and the personal and economic costs of non-adherence compel future research to continue the aim of this study: to add to the understanding of the patient-physician relationship and how this relationship is related to adherence. Cognitive-behavioral psychologists are in a unique position to assist in this essential endeavor on an individual, group, and societal level.

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Appendix

Figure 1. Hypothesis One Visual Inspection: Main Effect of Depression on Adherence

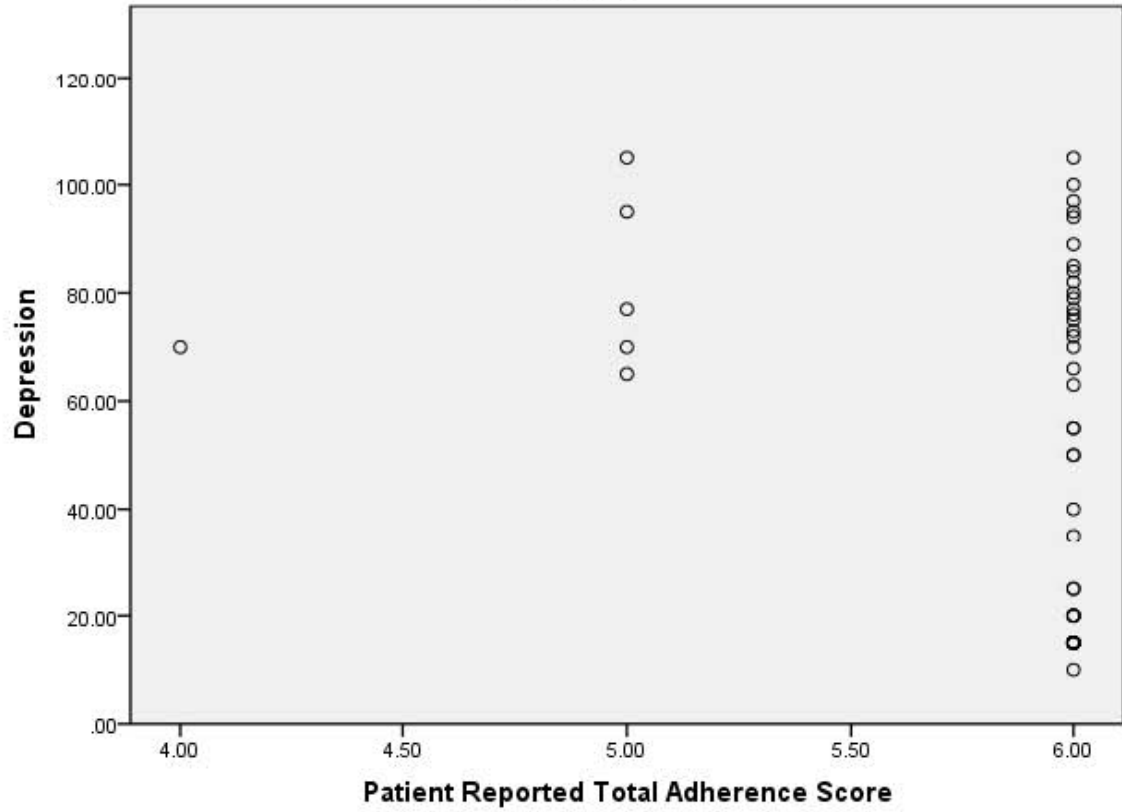
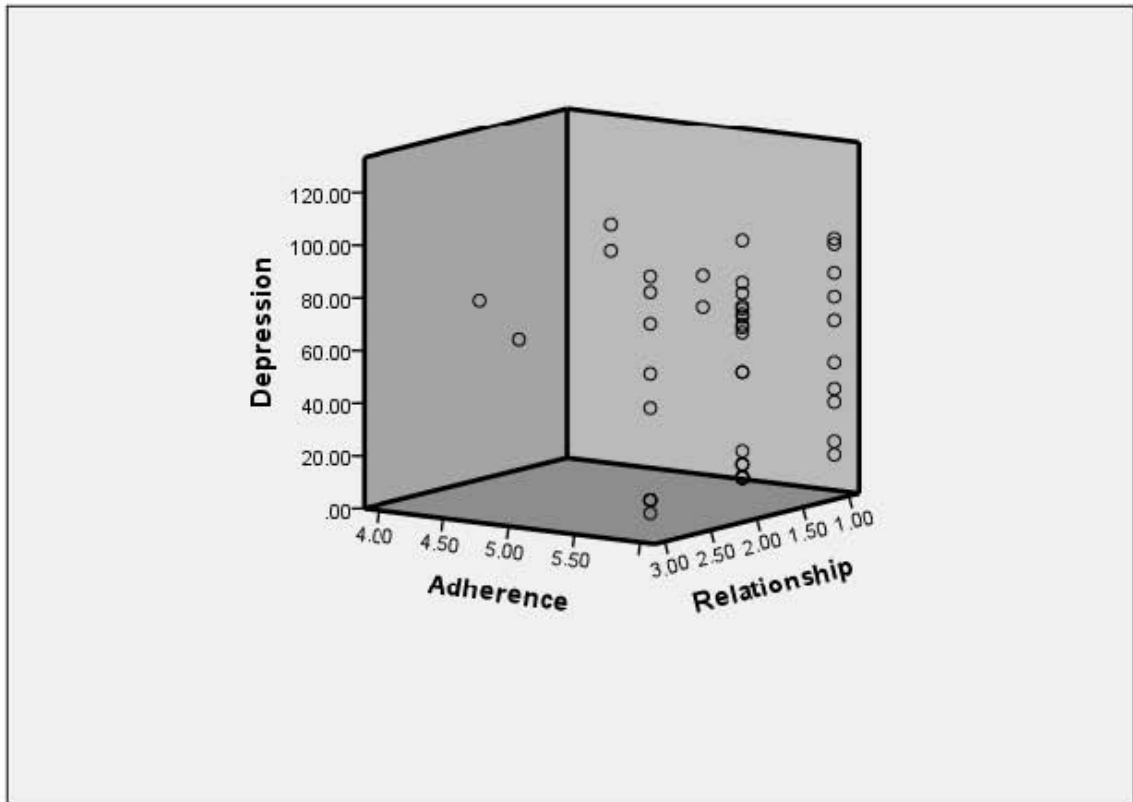


Figure 2.

Hypothesis Three: Depression, Adherence, and Relationship.





**Figure 3.**  
**Hypothesis Four Visual Inspection: Main Effect of Oppositional Coping Style on Adherence**

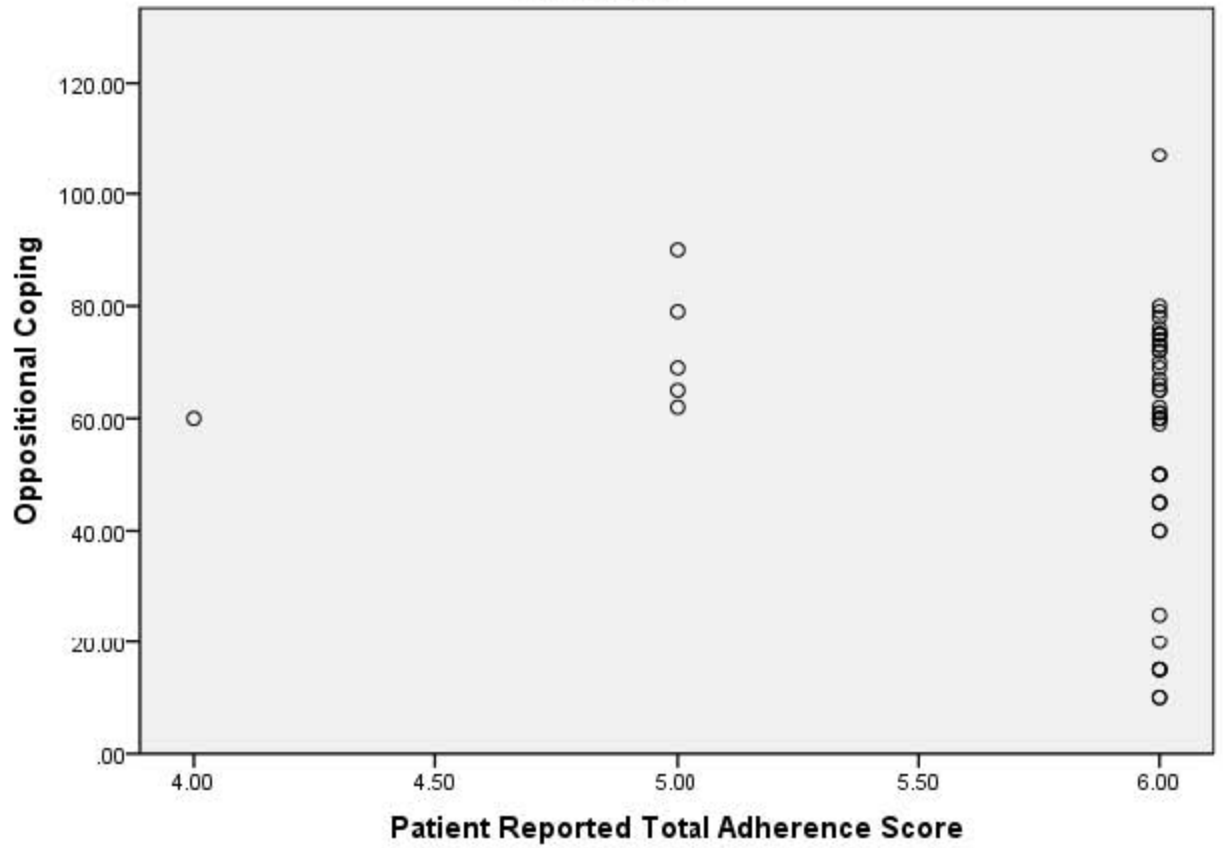
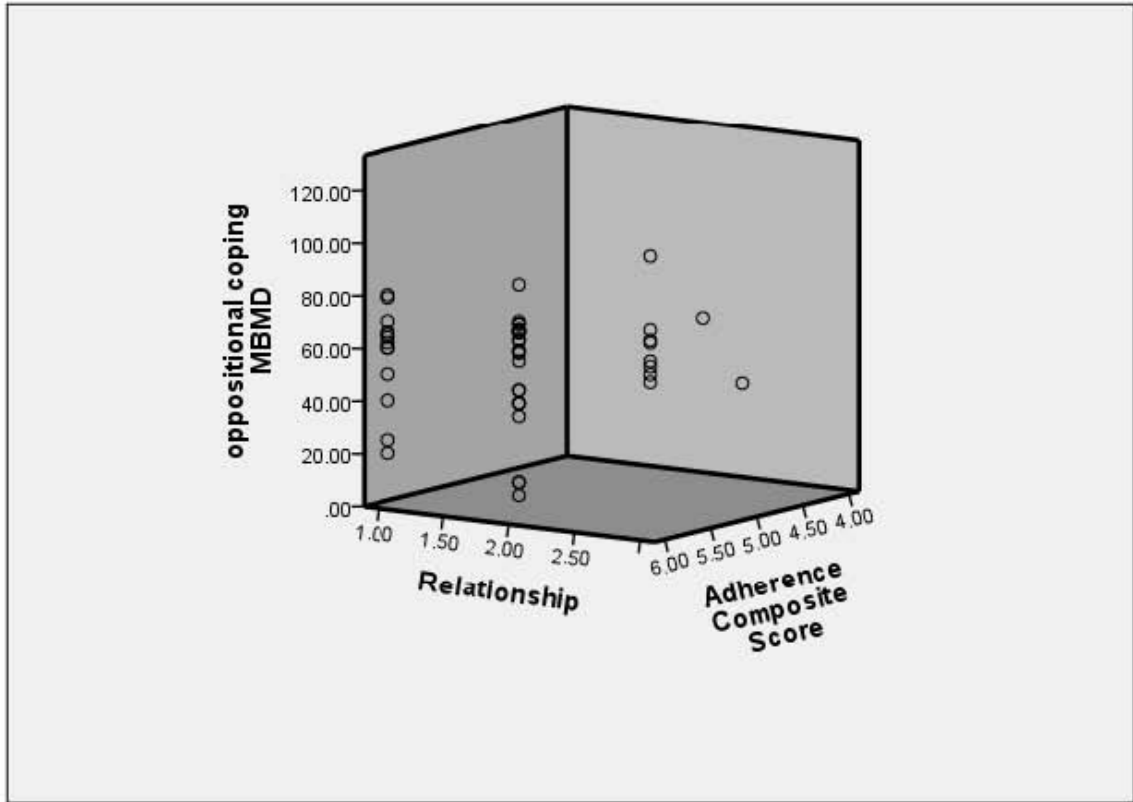
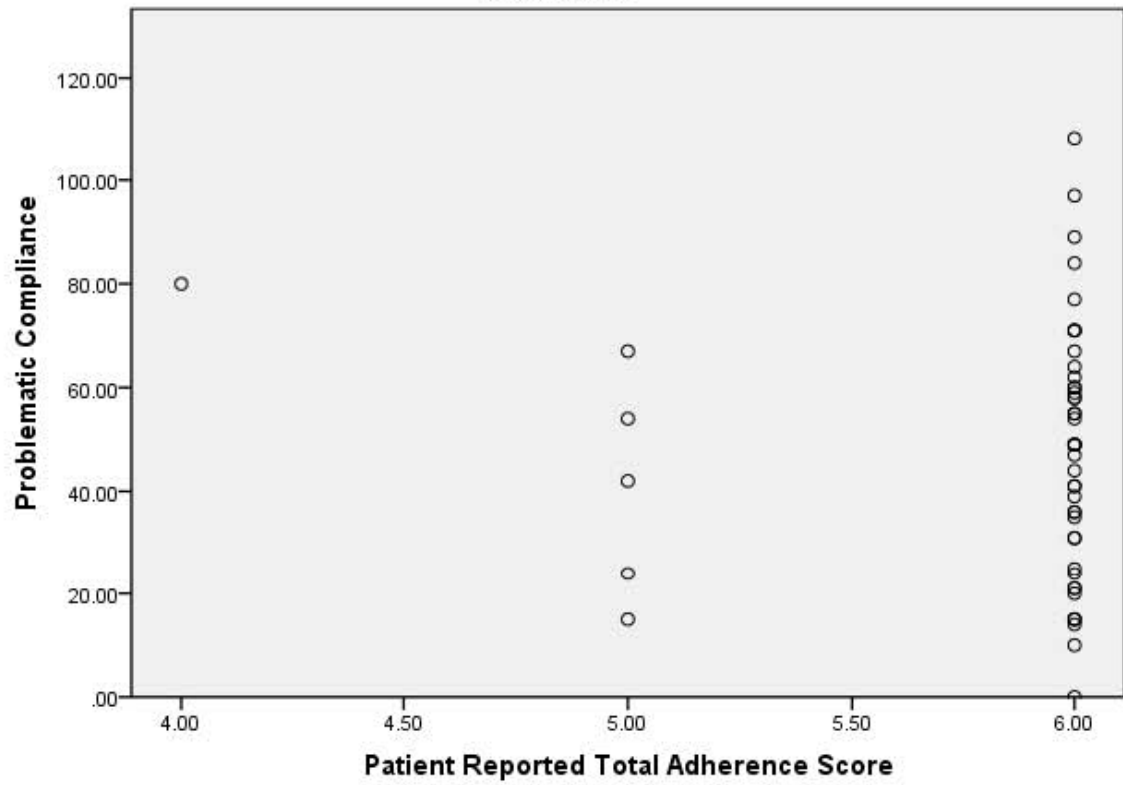


Figure 4.

Hypothesis Five: Oppositionality, Adherence, and Relationship



**Figure 5.**  
**Hypothesis Six Visual Inspection: Main Effect for Problematic Compliance and Adherence**



**Figure 6.**  
**Hypothesis Seven Visual Inspection: Interaction Effect for Problematic Compliance, Relationship and Adherence**

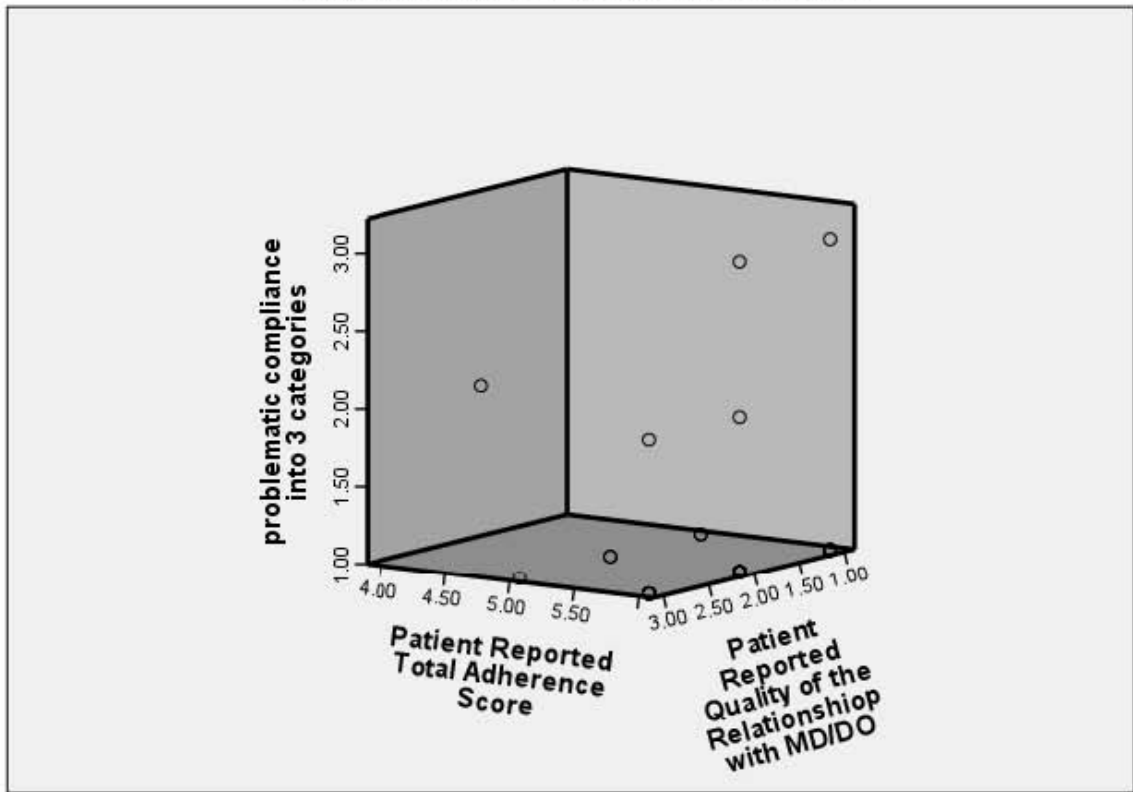
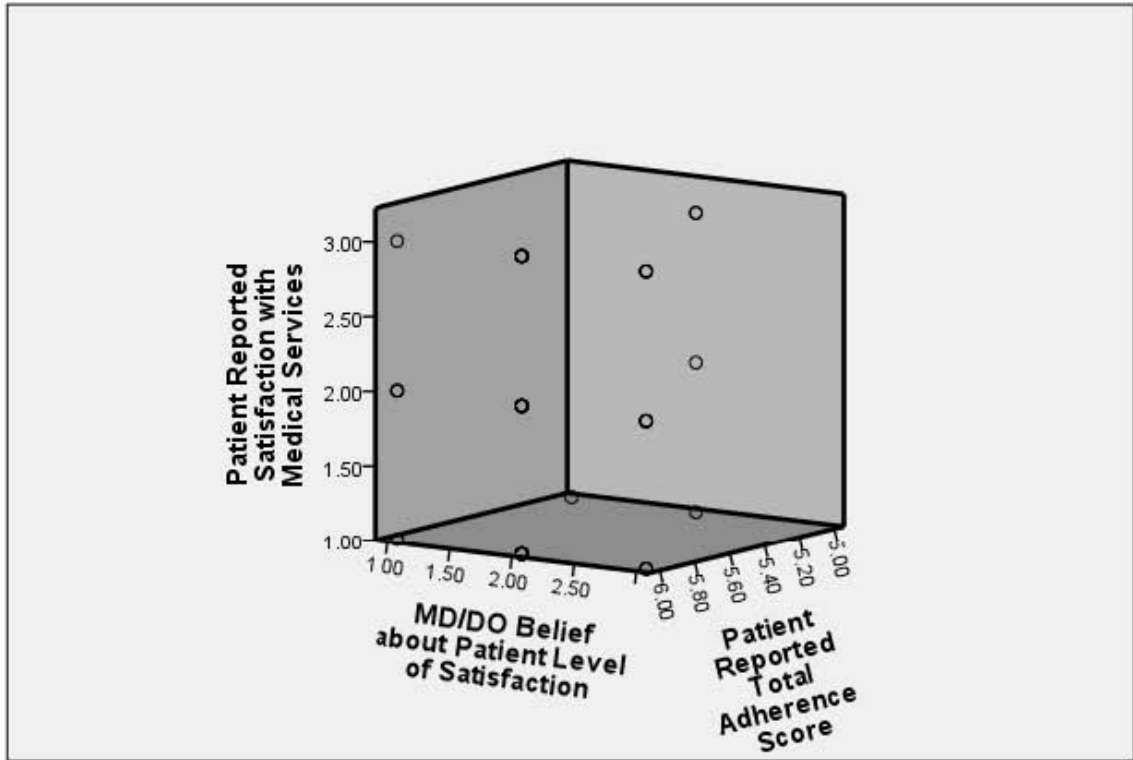
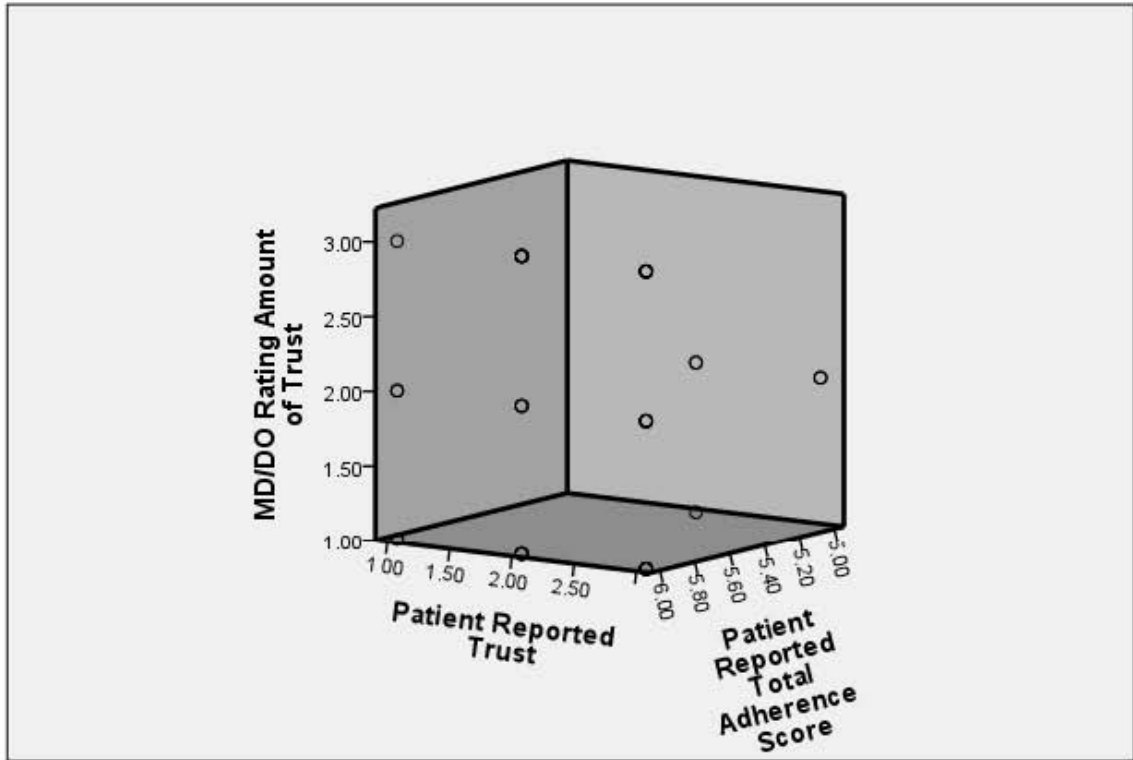


Figure 7.

Hypothesis Ten Visual Inspection: Does Better Symmetry between the Patient's Level of Satisfaction with Medical Services and the Physician's Belief about the Patient's Level of Satisfaction Predict Better Adherence?



**Figure 8.**  
**Hypothesis Twelve Visual Inspection: Does a Positive Correlation between Patient-Reported Amount of Trust and Physician-Reported Amount of Trust in the Relationship Predict Better Adherence?**



**Figure 9.**  
**Visual Inspection: Relation Between Oppositional Coping Style and Patient-Reported Satisfaction with Medical Services**

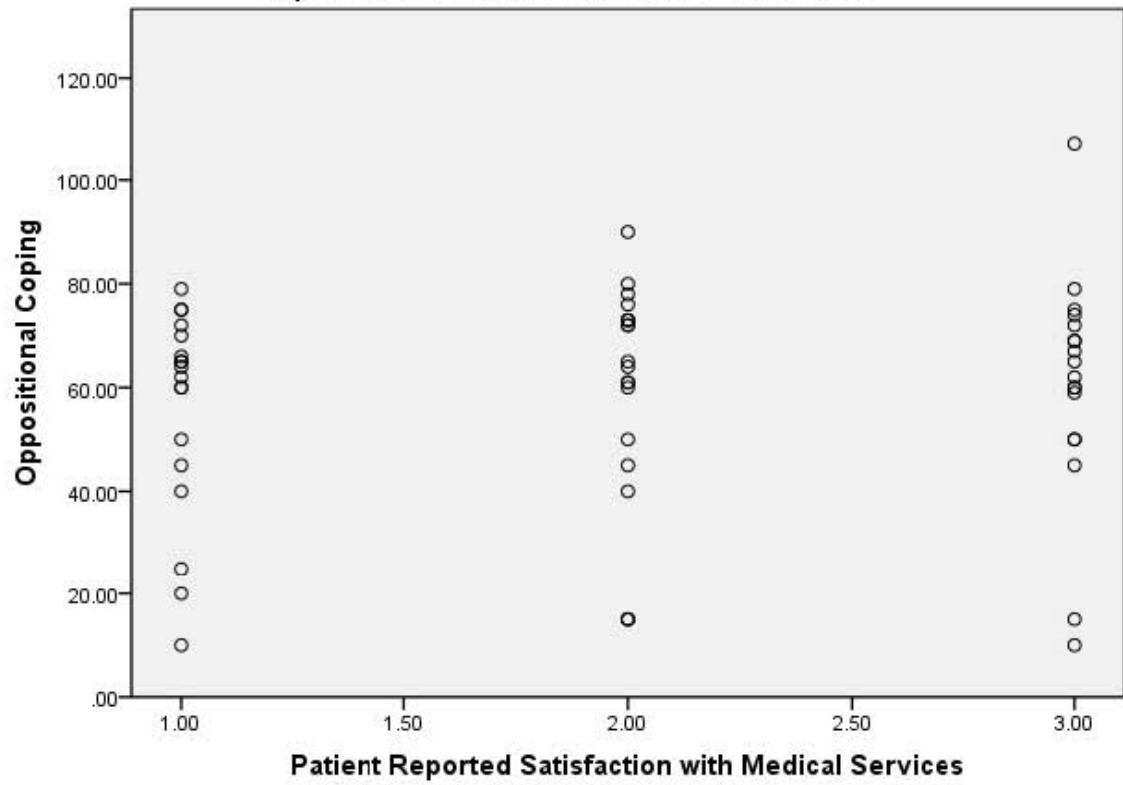
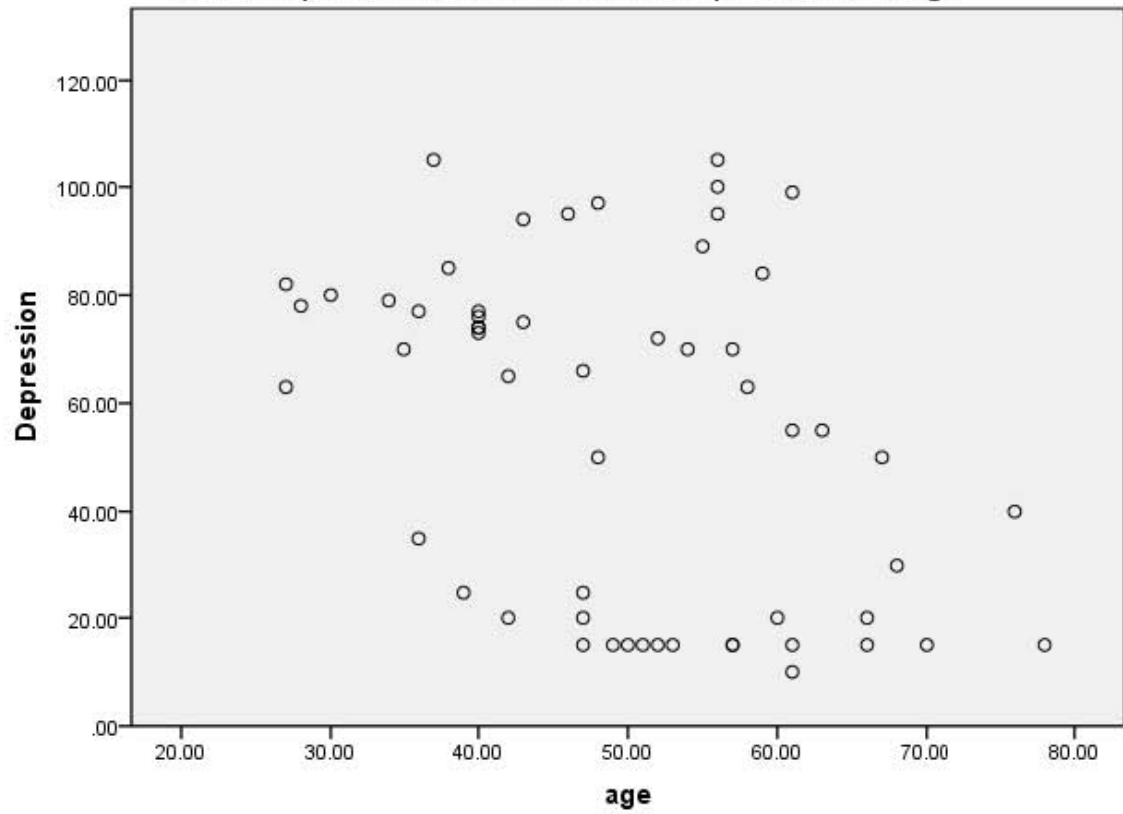
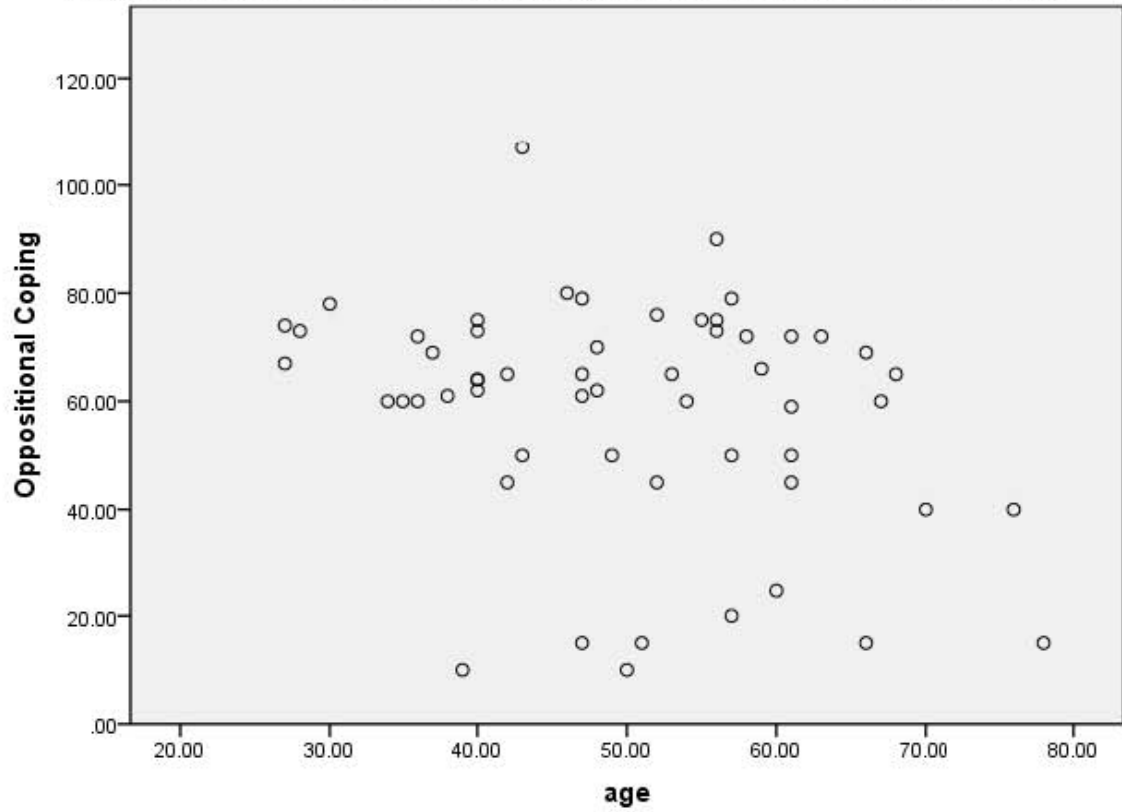


Figure 10.  
Visual Inspection: Relation between Depression and Age

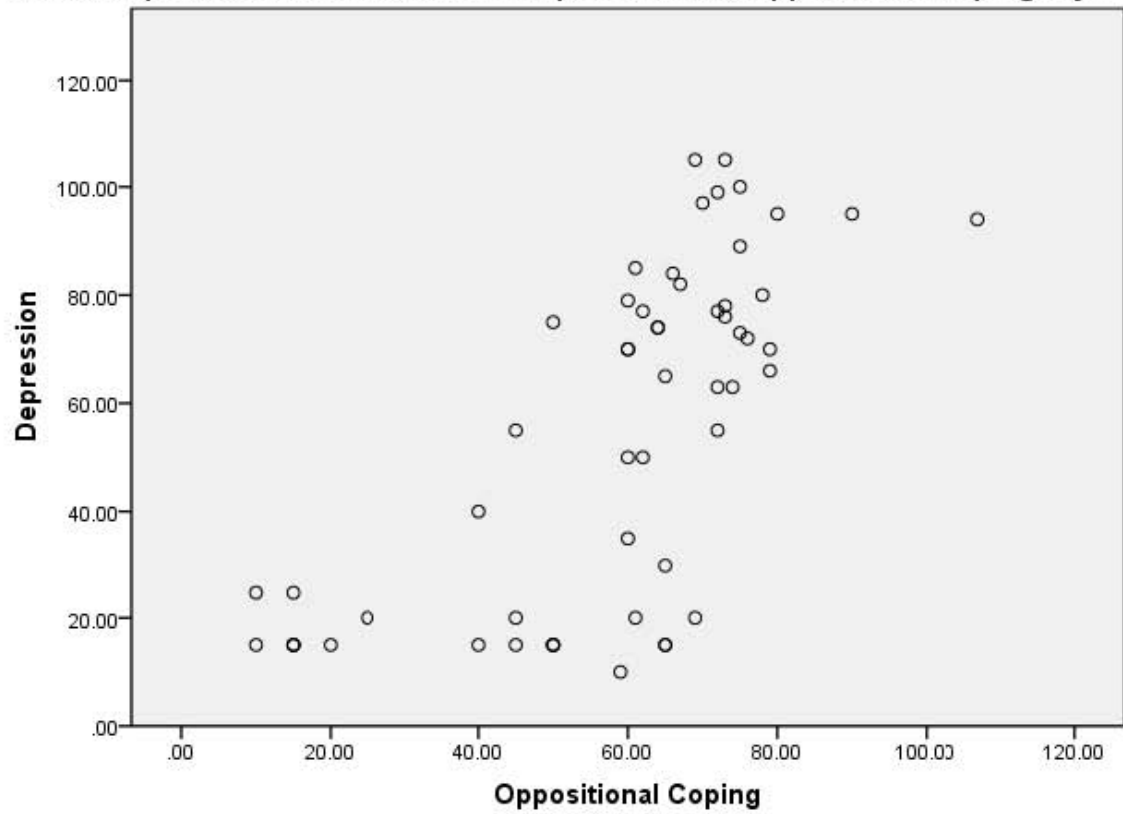




**Figure 11.**  
**Visual Inspection: Relation between Oppositional Coping Style and Age**



**Figure 12.**  
**Visual Inspection: Relation between Depression and Oppositional Coping Style**



THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

**Table 1. QUALITATIVE MEASURES (completed by the referring physician)**

1. It is very important that the professional relationship between a doctor and his/her patient be based on trust. Describe your relationship with this patient as to the amount of trust that exists.
2. Quality of life is the degree of well-being felt by a person regarding his/her physical and psychological health. The physical aspect includes such things as your overall health while the psychological aspect includes stress, worrying and pleasure in your life. Comment on your perception of this patient's physical and mental quality of life.
3. The degree to which a patient is happy with the quality of medical services received is called patient satisfaction. Describe the level of satisfaction with medical services that you believe this patient is currently experiencing.
4. Describe the current level of satisfaction you are experiencing regarding the relationship with this patient;
<b>BEHAVIORAL MEASURES OF ADHERENCE</b>
1. Does the patient usually keep his/her appointments with you? YES ___ NO ___
2. Does this patient usually fill his/her prescriptions? YES ___ NO ___
3. Does this patient usually obtain diagnostic tests when ordered? YES ___ NO ___

**Table 2. QUALITATIVE MEASURES (completed by the participant)**

1. It is very important that the professional relationship between a doctor and his/her patient be based on trust. Please briefly describe your relationship with your physician as it relates to the amount of trust that you feel.
2. Quality of life is the degree of well-being felt by a person regarding his/her physical and psychological health. The physical aspect includes such things as your overall health while the psychological aspect includes stress, worrying and pleasure in your life. Please briefly comment on your physical and mental quality of life.
3. The degree to which a patient is happy with the quality of medical services received is called patient satisfaction. Briefly describe your level of satisfaction with medical services you are currently receiving.
<b>BEHAVIORAL MEASURES OF ADHERENCE</b>
1. Do you usually keep your appointments with your physician? YES ___ NO ___
2. Do you usually fill your prescriptions? YES ___ NO ___
3. Do you usually obtain diagnostic tests when ordered? YES ___ NO ___

## THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 3.

### Frequency Distribution of Adherence Variable

#### Patient-Reported Level of Adherence to Medical Regimes

Level of Adherence	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 4.00	1	1.8	2.0	2.0
5.00	5	8.9	10.0	12.0
6.00	44	78.6	88.0	100.0
Total	50	89.3	100.0	
Missing 99.00	6	10.7		
Total	56	100.0		

#### Physician's Ratings of Patient's Adherence to Medical Regimes

Level of Adherence	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 4.00	1	1.8	2.0	2.0
5.00	1	1.8	2.0	4.1
6.00	47	83.9	95.9	100.0
Total	49	87.5	100.0	
Missing 99.00	7	12.5		
Total	56	100.0		

## THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 4.

Hypothesis Two Visual Inspection: Main Effect of Depression on Adherence

PATIENT ID	PATIENT REPORTED QUALITY OF THE RELATIONSHIP WITH PHYSICIAN	PATIENT REPORTED LEVEL OF ADHERENCE
45.00	99.00	6.00
47.00	3.00	5.00
17.00	3.00	6.00
10.00	3.00	6.00
12.00	3.00	6.00
43.00	3.00	6.00
11.00	3.00	6.00
29.00	3.00	6.00
21.00	3.00	6.00
62.00	3.00	6.00
55.00	3.00	6.00
16.00	2.00	6.00
44.00	2.00	5.00
42.00	2.00	6.00
33.00	2.00	6.00
23.00	2.00	6.00
1.00.	2.00	99.00
19.00	2.00	6.00
9.00	2.00	6.00
39.00.	2.00	99.00
50.00	2.00	6.00
51.00	2.00	6.00
20.000	2.00	6.00
57.00	2.00	6.00
53.00	2.00	6.00
24.00	2.00	5.00
27.00	2.00	6.00
32.00	2.00	6.00
2.00	2.00	6.00
36.00	2.00	6.00
15.00	2.00	6.00
14.00	2.00	6.00
35.00	2.00	6.00
58.00	2.00	6.00
18.00	2.00	6.00
3.00	2.00	99.00
5.00	2.00	6.00
61.00	2.00	6.00

THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 4. continued

Hypothesis Two Visual Inspection: Main Effect of Depression on Adherence

<b>PATIENT ID</b>	<b>PATIENT REPORTED QUALITY OF THE RELATIONSHIP WITH PHYSICIAN</b>	<b>PATIENT REPORTED LEVEL OF ADHERENCE</b>
<b>60.00</b>	<b>2.00</b>	<b>6.00</b>
<b>59.00</b>	<b>2.00</b>	<b>6.00</b>
<b>8.00</b>	<b>2.00</b>	<b>99.00</b>
<b>22.00</b>	<b>1.00</b>	<b>6.00</b>
<b>28.00</b>	<b>1.00</b>	<b>6.00</b>
<b>7.00</b>	<b>1.00</b>	<b>99.00</b>
<b>38.00</b>	<b>1.00</b>	<b>6.00</b>
<b>34.00</b>	<b>1.00</b>	<b>6.00</b>
<b>49.00</b>	<b>1.00</b>	<b>5.00</b>
<b>25.00</b>	<b>1.00</b>	<b>6.00</b>
<b>31.00</b>	<b>1.00</b>	<b>6.00</b>
<b>13.00</b>	<b>1.00</b>	<b>6.00</b>
<b>6.00</b>	<b>1.00</b>	<b>6.00</b>
<b>26.00</b>	<b>1.00</b>	<b>6.00</b>
<b>41.00</b>	<b>1.00</b>	<b>6.00</b>
<b>30.00</b>	<b>1.00</b>	<b>6.00</b>

## THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 5.

Hypothesis Eight Visual Inspection: Main Effect of the Physician's Own Level of Satisfaction with the Relationship and Patient-Reported Level of Adherence

<u>Adherence</u>	<u>Dr. Sat</u>	<u>Adherence</u>	<u>Dr. Sat</u>	<u>Adherence</u>	<u>Dr. Sat</u>
5.00	1.00	6.00	3.00	6.00	3.00
6.00	1.00	6.00	3.00	6.00	3.00
99.00	1.00	6.00	3.00	6.00	99.00
6.00	1.00	6.00	3.00	99.00	99.00
6.00	1.00	6.00	3.00	99.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
5.00	2.00	6.00	3.00	6.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
6.00	2.00	99.00	3.00	6.00	99.00
6.00	2.00	6.00	3.00	4.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
6.00	2.00	6.00	3.00	6.00	99.00
99.00	2.00	6.00	3.00		
5.00	2.00	6.00	3.00		
5.00	2.00	99.00	3.00		
6.00	2.00	6.00	3.00		
5.00	2.00	6.00	3.00		
6.00	2.00	6.00	3.00		
6.00	2.00	6.00	3.00		

## THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 6.

Hypothesis Nine Visual Inspection: Correlation between the Patient-Reported Satisfaction with Medical Services and the Physician's Belief about the Patient's Satisfaction with Medical Services

<u>Pt Satisfaction</u>	<u>Dr. Belief</u>	<u>Pt Satisfaction</u>	<u>Dr. Belief</u>	<u>Pt Satisfaction</u>	<u>Dr. Belief</u>
1.00	1.00	2.00	3.00	3.00	2.00
1.00	2.00	2.00	2.00	3.00	2.00
1.00	2.00	2.00	3.00	3.00	2.00
1.00	2.00	2.00	1.00	3.00	2.00
1.00	2.00	2.00	2.00	3.00	2.00
1.00	1.00	2.00	2.00	3.00	3.00
1.00	1.00	2.00	2.00	3.00	3.00
1.00	3.00	2.00	3.00	3.00	2.00
1.00	3.00	2.00	2.00	3.00	3.00
1.00	3.00	2.00	2.00	3.00	2.00
1.00	2.00	2.00	2.00	3.00	2.00
1.00	3.00	2.00	2.00	3.00	1.00
1.00	2.00	2.00	3.00	3.00	99.00
1.00	2.00	2.00	99.00	3.00	99.00
1.00	2.00	2.00	99.00	3.00	99.00
1.00	99.00	2.00	3.00	3.00	2.00
1.00	1.00	2.00	1.00		
1.00	2.00	2.00	2.00		
2.00	1.00	3.00	2.00		
2.00	2.00	3.00	3.00		



THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 7.

Hypothesis Eleven Visual Inspection: Correlation between Patient-Reported and Physician-Reported Level of Trust in the Relationship

<u>Pt Trust</u>	<u>Dr. Trust</u>	<u>Pt Trust</u>	<u>Dr. Trust</u>	<u>Pt Trust</u>	<u>Dr. Trust</u>
1.00	2.00	2.00	1.00	3.00	3.00
1.00	2.00	2.00	2.00	3.00	3.00
1.00	1.00	2.00	3.00	3.00	2.00
1.00	1.00	2.00	3.00	3.00	2.00
1.00	3.00	2.00	3.00	3.00	2.00
1.00	99.00	2.00	1.00	3.00	1.00
1.00	99.00	2.00	99.00	3.00	2.00
2.00	1.00	2.00	99.00	3.00	1.00
2.00	1.00	3.00	1.00	3.00	2.00
2.00	2.00	3.00	1.00	3.00	1.00
2.00	2.00	3.00	3.00	3.00	2.00
2.00	3.00	3.00	3.00	3.00	2.00
2.00	3.00	3.00	3.00	3.00	3.00
2.00	1.00	3.00	1.00	3.00	3.00
2.00	1.00	3.00	3.00	3.00	3.00
2.00	2.00	3.00	99.00	3.00	2.00
2.00	3.00	3.00	1.00	3.00	2.00
2.00	3.00	3.00	2.00	99.00	3.00
2.00	2.00	3.00	3.00		

# THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 8.

## Patient-Reported level of Adherence by Each Question:

Patient Reported - Keeping Appointments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	4	7.1	7.8	7.8
	yes	47	83.9	92.2	100.0
	Total	51	91.1	100.0	
Missing	99.00	5	8.9		
Total		56	100.0		

Patient Reported- Filling Prescriptions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	1	1.8	2.0	2.0
	yes	50	89.3	98.0	100.0
	Total	51	91.1	100.0	
Missing	99.00	5	8.9		
Total		56	100.0		

Patient Reported - Obtaining Diagnostic Tests

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	2	3.6	4.0	4.0
	yes	48	85.7	96.0	100.0
	Total	50	89.3	100.0	
Missing	99.00	6	10.7		
Total		56	100.0		

THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 9.

Correlation between Depression as a Continuous Variable and Physician's Belief about Patient's Satisfaction with Medical Services

		MBMD Depression rating	MDs belief about patient satisfaction with medical services
MBMD	Pearson Correlation	1	-.483(**)
Depression rating	Sig. (1-tailed)		.000
	N	56	50
MDs belief about patient satisfaction with medical services	Pearson Correlation	-.483(**)	1
	Sig. (1-tailed)	.000	
	N	50	50

\*\* Correlation is significant at the 0.01 level (1-tailed).

Correlation between Depression into 3 Categories and Physician's Belief about Patient's Satisfaction with Medical Services

		depression into 3 categories	MDs belief about patient satisfaction with medical services
depression into 3 categories	Pearson Correlation	1	-.337(*)
	Sig. (2-tailed)		.017
	N	56	50
MDs belief about patient satisfaction with medical services	Pearson Correlation	-.337(*)	1
	Sig. (2-tailed)	.017	
	N	50	50

\* Correlation is significant at the 0.05 level (2-tailed).

THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 10.

Correlation between MBMD Oppositional Coping Style as a continuous variable and Physician's Belief about Patient's Level of Satisfaction with Medical Services

		oppositional coping MBMD	MDs belief about patient satisfaction with medical services
oppositional coping MBMD	Pearson Correlation	1	-.396(**)
	Sig. (2-tailed)		.004
	N	56	50
MDs belief about patient satisfaction with medical services	Pearson Correlation	-.396(**)	1
	Sig. (2-tailed)	.004	
	N	50	50

\*\* Correlation is significant at the 0.01 level (2-tailed).

Correlation between MBMD Oppositional Coping Style into 3 categories and Physician's Belief about Patient's Level of Satisfaction with Medical Services

		oppositional into 3 categories	MDs belief about patient satisfaction with medical services
oppositional into 3 categories	Pearson Correlation	1	-.256
	Sig. (2-tailed)		.073
	N	56	50
MDs belief about patient satisfaction with medical services	Pearson Correlation	-.256	1
	Sig. (2-tailed)	.073	
	N	50	50

THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 11.

Correlation between MBMD Depression Rating and Age: Visual Inspection

	Frequency	Percent	Valid Percent	Cumulative Percent	Depression rating	MBMD category
Valid 27.00	2	3.6	3.6	3.6	63, 82	(1)Suggestive
28.00	1	1.8	1.8	5.4	78	Suggestive
30.00	1	1.8	1.8	7.1	80	Suggestive
34.00	1	1.8	1.8	8.9	79	Suggestive
35.00	1	1.8	1.8	10.7	70	
36.00	2	3.6	3.6	14.3	77,35	(1)Suggestive
37.00	1	1.8	1.8	16.1	105	Prominent
38.00	1	1.8	1.8	17.9	85	Prominent
39.00	1	1.8	1.8	19.6	25	
40.00	5	8.9	8.9	28.6	77,73,74, 76,74	(2)Suggestive
42.00	2	3.6	3.6	32.1	65,20	
43.00	2	3.6	3.6	35.7	75,94	(1)Sugg(1)Pr,
46.00	1	1.8	1.8	37.5	95	Prominent
47.00	4	7.1	7.1	44.6	15, 25, 66, 20	
48.00	2	3.6	3.6	48.2	50, 97	(1)Prominent
49.00	1	1.8	1.8	50.0	15	
50.00	1	1.8	1.8	51.8	15	
51.00	1	1.8	1.8	53.6	15, 15	
52.00	2	3.6	3.6	57.1	15, 72	
53.00	1	1.8	1.8	58.9	15	
54.00	1	1.8	1.8	60.7	70	
55.00	1	1.8	1.8	62.5	89	(1)Prominent
56.00	3	5.4	5.4	67.9	105, 100, 95	(3)Prominent
57.00	2	3.6	3.6	71.4	15, 15	
58.00	2	3.6	3.6	75.0	70, 63	

THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 12.

Visual Inspection: Correlation between MBMD Oppositional Coping Style Rating and Age

	AGE	Frequency	Percent	Valid Percent	Cumulative Percent	Oppositional Coping rating	MBMD category
Valid	27.00	2	3.6	3.6	3.6	74, 67	
	28.00	1	1.8	1.8	5.4	73	
	30.00	1	1.8	1.8	7.1	78	Suggestive
	34.00	1	1.8	1.8	8.9	60	
	35.00	1	1.8	1.8	10.7	60	
	36.00	2	3.6	3.6	14.3	72, 60	
	37.00	1	1.8	1.8	16.1	69	
	38.00	1	1.8	1.8	17.9	61	
	39.00	1	1.8	1.8	19.6	10	
	40.00	5	8.9	8.9	28.6	62, 75, 64, 73, 64	(1)Suggestive
	42.00	2	3.6	3.6	32.1	65, 45	
	43.00	2	3.6	3.6	35.7	50, 107	(1)Prominent
	46.00	1	1.8	1.8	37.5	80	(1)Suggestive
	47.00	4	7.1	7.1	44.6	65, 15, 79, 61	(1)Suggestive
	48.00	2	3.6	3.6	48.2	62, 70	
	49.00	1	1.8	1.8	50.0	50	
	50.00	1	1.8	1.8	51.8	10	
	51.00	1	1.8	1.8	53.6	15	
	52.00	2	3.6	3.6	57.1	45, 76	(1)Suggestive
	53.00	1	1.8	1.8	58.9	65	
	54.00	1	1.8	1.8	60.7	60	
	55.00	1	1.8	1.8	62.5	75	(1)Suggestive
	56.00	3	5.4	5.4	67.9	73, 75, 90	(1)Sugg/(1)Pr
	57.00	2	3.6	3.6	71.4	50, 20	
	58.00	2	3.6	3.6	75.0	79, 72	(1)Suggestive
	59.00	1	1.8	1.8	76.8	66	

## THE PATIENT-PHYSICIAN RELATIONSHIP AND ADHERENCE

Table 13.

Correlation between MBMD Depression and Oppositional Coping Style Ratings (continuous variable)

		Depression MBMD rating	oppositional coping MBMD
Depression MBMD rating	Pearson Correlation	1	.699(**)
	Sig. (2-tailed)		.000
	N	56	56
oppositional coping MBMD	Pearson Correlation	.699(**)	1
	Sig. (2-tailed)	.000	
	N	56	56

\*\* Correlation is significant at the 0.01 level (2-tailed).

Correlation between MBMD Depression and Oppositional Coping Style Ratings (3 levels)

		Oppositional Coping Style into 3 categories	Depression into 3 categories
Oppositional Coping Style into 3 categories	Pearson Correlation	1	.411**
	Sig. (2-tailed)		.002
	N	56	56
Depression into 3 categories	Pearson Correlation	.411**	1
	Sig. (2-tailed)	.002	
	N	56	56

\*\* Correlation is significant at the 0.01 level (2-tailed).