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The Effects of Financial Literacy on Patient Engagement

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Health care reform has caused consumers to learn more about what it means to have health insurance and its costs. Patient engagement, a critical component of health care reform, reflects provider and consumer attention to shared decision making between patient and physician. The problem addressed in this study is that although researchers have studied patient engagement, there has been insufficient exploration of the relationship between financial literacy and patient engagement, which could negatively impact health outcomes not only for patients or consumers but for society as a whole. The purpose of this quantitative research was to determine if a relationship exists between patient financial literacy and patient engagement, as measured by the patient activation measure. The potential effects of increased patient financial responsibility due to high deductible health plans, measured via an item inquiring about participants' deductible, as well as shared decision making between physician and patient were also evaluated as potential moderators between financial literacy and patient engagement. Theories used to provide conceptual context include Shim's cultural health capital theory and Bourbeau's (2008) self-management model. Two hierarchical linear multiple regression models were used to test the research hypotheses. While the research did not find a significant relationship between patient financial literacy and patient engagement, it did confirm the importance of mental health status and patient-physician shared decision making as important predictors of patient engagement. These findings provide a better understanding of financial literacy and specific financial behaviors in the context of healthcare environment today.

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Chapter 1: Introduction

Health care reform in the United States has brought patient-based factors, financial literacy, and patient engagement to the forefront, and these factors are emerging as important variables to study in business research (Barrelo, Graffigna, & Vegni, 2012; Hibbard, Green, & Overton, 2013). One aspect of health care reform that has changed patient care is the requirement that patients must become more engaged in the health care process, including managing their health care finances (Braun, Kim, & Anderson, 2010). Financial literacy, in general, has been defined as the ability to manage financial resources (Brobeck, 1998). In the specific context of health care, the term refers to the use of financial knowledge to make financial decisions throughout life (Braun et al., 2010). High-quality health care depends on successful patient engagement, defined as "actions individuals must take to obtain the greatest benefit from the health care services available to them" (Center for Advancing Health, 2010, p. 1). Patient engagement can be represented by patient –provider interaction, active patient participation in health care decisions, and patient involvement in the health care organization (Carman et al., 2013). Carman et al. (2013) noted that financial literacy and patient engagement can provide consumers with a pathway toward achieving better quality of care and greater cost efficiency, ultimately improving overall population health.

This chapter provides a synopsis of the research study. The chapter opens with a summary of the research literature related to the study topic. A brief overview of the theories that guide the study follows; a more comprehensive discussion of these theories appears in Chapter 2. The focus changes to the nature of the study, which provides

information on the study research design and methodology. Pertinent definitions are then presented, followed by a review of the study's (a) assumptions, (b) scope and delimitations, (c) limitations, and (d) significance. The chapter concludes with a summary.

Background

The Affordable Care Act (i.e., health care reform, as used in this study) has resulted in many changes to health care, particularly for consumers who must now learn the importance of having health insurance and the costs associated with that insurance (Kim, Braun, & Williams, 2013; Long & Goin, 2013). The change in insurance status requires that new consumers build their cultural health capital, that is, their efficacy in effectively engaging with the medical community and in being financially responsible with regard to health care costs (Barcellos et al., 2014; Long, 2013).

Closely related critical components of health care reform are patient engagement and the shift to patient-centered care practices, which include providing financial information and education, and shared decision making about health care between the patient and physician (Coulter, 2012; Couto & Comer, 2012; Kupfer & Bond, 2012). A broad spectrum of terms and definitions of patient engagement has been proposed. Coulter's definition (2011) focused on finding ways for patients and health care providers to work together to make better health care decisions. Coulter further refined the definition to focus on the three areas of health literacy: shared decision making and quality improvement, and a list of promising interventions proposed in each area. Patient activation is often used as a proxy for patient engagement, and research has shown that

activated patients often have better health outcomes and care experiences (Hibbard & Greene, 2013). For the purposes of this research, patient engagement is defined as a patient being involved in his or her health care, including participating in making health care decisions.

Financial literacy and its impact on health care, particularly with regards to shared decision making and patient engagement, have been researched only on a limited basis. James, Boyle, Bennett, and Bennett (2012) conducted one of the few studies that examined whether financial literacy predicted decision making regarding health care insurance plans. The authors concluded that improvements in literacy facilitate better decision making as it relates to making savvy decisions regarding health care insurance, and they furthermore posited that financial literacy could lead to better health outcomes in later years (James et al., 2012). Bauhoff, Carman, and Wupperman (2013) found that financial literacy was lowest among "the population eligible to receive subsidies and most likely to enroll in the exchanges" (p. 12). Poor financial literacy among consumers has been significantly associated with poor financial behaviors with regard to health care (Greene, Peters, Mertz, & Hibbard, 2008; Robb & Woodyard, 2011). Studies (Lieu et al., 2009; Yegian, Dardess, Shannon, & Carman, 2013) have shown that factors surrounding patient engagement, such as individuals' beliefs about their roles as patients, can play a role in consumer's understanding of their financial responsibilities for their health care. Shared decision making between health care providers and patients has been proposed as a more transparent way to control costs while allowing patients to have more impact on actions that affect their own out-of-pocket expenses (Sommers et al., 2013). The

Consumer Finance Protection Bureau (CFPB) has heightened awareness of the need for more consumer financial education through its efforts.

Problem Statement

The problem addressed in this study was that, while patient engagement has received much research attention (Barello, Graffigna, & Vegni, 2012; Carman et al., 2013; Center for Advancing Health, 2010; Hibbard & Mahoney, 2010; Institute of Medicine, 2011), including its relationship to health literacy (e.g., Coulter, 2011; Hibbard, Greene, & Overton, 2013), few researchers have examined the relationship between financial literacy and patient engagement. A lack of understanding of the linkages between financial literacy and patient engagement could limit needed health care services and negatively impact health outcomes (Braun et al., 2010; James et al., 2012) and could furthermore add to the "growing societal problems caused by poor consumer decisions about financial services" (Huhmann & McQuitty, 2009, p. 272).

Purpose

The purpose of this quantitative research was to determine if a relationship exists between patient financial literacy, as measured by the financial management behavior scale (FMBS; Dew & Xiao, 2011) and patient engagement, as measured by the patient activation measure (PAM; Hibbard et al., 2005). The potential effects of increased patient financial responsibility resulting from high deductible health plans, measured via an item inquiring about participants' deductible, as well as shared decision making between physician and patient, measured via the shared decision making-9 questionnaire (SDM-Q-9; Kriston et al., 2010) also was evaluated as potential moderators between

financial literacy and patient engagement. Theories used to provide conceptual context include Shim's (2010) cultural health capital (CHC) theory and Bourbeau's (2008) self-management model.

Research Question and Hypotheses

Financial literacy was the independent variable, measured via the FMBS (Dew & Xiao, 2011). The dependent variable, patient engagement, was measured using the PAM (Hibbard et al., 2005). There were two moderating variables: (a) patient financial responsibility, measured via an item inquiring about participants' deductible; and (b) shared decision making between physician and patient, measured via the shared decision making-9 questionnaire (SDM-Q-9; Kriston et al., 2010). The research questions and hypotheses follow:

Research Question 1

To what degree does patient financial literacy affect patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H1o. There is no statistically significant relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H1a. There is a statistically significant and positive relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 2

To what degree does patient financial responsibility due to high health plan deductibles affect the relationship between financial literacy and patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H2o. Patient financial responsibility due to high health plan deductibles will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H2a. Patient financial responsibility due to high health plan deductibles will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 3

To what degree does patient-physician shared decision making affect the relationship between patient financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults?

H3o. Patient-physician shared decision making will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H3a. Patient-physician shared decision making will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Theoretical Models

Theories used to provide conceptual context for this dissertation topic were Shim's (2010) cultural health capital (CHC) theory and Bourbeau's (2008) self-management model. Shim (2010) presented CHC as a set of culture skills and competencies that may lead to better health care relationships. Shim proposed CHC as a theoretical framework for linking culture skills and competencies to broader social inequalities present in health care relationships and encounters. Evaluation of financial literacy as part of these competencies fit with the CHC framework. CHC develops as patients seek medical information, exercise decision making, and engage in self-surveillance (Shim, 2010). Shim proposed that in contemporary times patients need a range of cultural competencies to maximize the benefit of their health care. As the name implies, CHC is a form of capital, as its competencies are utilized via clinical interventions (Shim, 2010).

Part of the CHC framework also focuses on patient characteristics that may affect exchange of information between patients and providers. Health literacy is one of the characteristics mentioned and is considered critical to basic communication in the health care process (Shim, 2010). Certain health care scenarios also require an understanding of financial impact; in that regard, evaluating financial literacy is important. A key finding is that inadequate health literacy, and potentially financial literacy, is found predominately among those with a lower socioeconomic status (Shim, 2010). Therefore, this research had implications for social inequities and social change as well.

Bourbeau (2008) proposed a self-management model based on three primary characteristics. The model focused on disease management, problem-solving and patient self-efficacy, and the partnership between patients and health care professionals to address health care situations (Bourbeau, 2008). Bourbeau created the model as a way of ensuring patient engagement in health care situations, particularly disease management. Financial obligations for health care could be one such health care situation. Operant behavior and social cognitive theory are the basis for the process model of self-management (Bourbeau, 2008). Behavior consequences lead to behavioral outcome expectations (Bourbeau, 2008). This model can be applied to financial literacy and patient engagement, where being more financially literate leads to more expectations about health care outcomes, including engagement.

Self-efficacy in this situation means how much a patient believes he or she can respond to or take action as needed in health care situations (Bourbeau, 2008). This is particularly important in situations that require behavior change, such as disease management (Bourbeau, 2008). Patients also need to take action regarding to the financial implications of health care decisions and services. Bourbeau (2008) found that self-efficacy is a major factor that promotes self-management skills. Self-management occurs when patients engage in specific self-care behaviors to better manage the disease impact. The intent is to encourage active participation, where patients communicate concerns and priorities to health care professionals (Bourbeau, 2008).

Nature of the Study

Given that the research purpose of this study was to assess the relationship between patient financial literacy and patient engagement, the research design used for this project was correlational. Frankfort-Nachmias and Nachmias (2008) noted that correlational studies are usually conducted to describe the pattern of relations between variables. Additionally, patient financial literacy is a personal construct that cannot be manipulated; thus, an experimental or quasi-experimental design would not be appropriate (Campbell & Stanley, 1963). Therefore, the correlational design was the most appropriate for this project.

The correlational design has a number of strengths and weaknesses. Key strengths include the ability to study a range of variables and to look at multiple variables at one time (Campbell & Stanley, 1963). Campbell and Stanley (1963) pointed out that correlational studies can be followed by an experimental design if a relationship between variables is established. In this sense, the correctional design is a good first step when investigating a number of variables.

The correlational design also has a number of limitations. First, causation cannot be determined; only relationships or correlations can be established (Campbell & Stanley, 1963). Additionally, two variables can seem to be correlated, but, when other variables are accounted for, the seeming correlation disappears (Campbell & Stanley, 1963). Finally, there can also be problems with reliability and validity of self-report measures collected via surveys, which are frequently used with correlational designs (Campbell & Stanley, 1963).

Definitions

The variables used in the study are defined below.

Independent variables (IV): Financial literacy as measured by the financial management behavior scale (FMBS). The FMBS has 15 items measured on a 5-point scale: 1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, 5 = *always* (Dew & Xiao, 2011, p. 58). The authors also assessed psychometric properties using a nationally representative sample and found the measure to be valid and reliable (Dew & Xiao, 2011).

Moderating variables: Patient financial responsibility as measured by having a high deductible health plan. A high deductible health plan is a health plan with an annual deductible that is not less than $1,200 (in 2014) or $1,300 (in 2015) for self-only coverage (IRS, 2014). Shared decision making will be measured using the SDM-Q-9, which contains nine items rated on a 5-point scale (Kriston et al., 2010).

Dependent variable (DV): Patient engagement as measured by the PAM, which indicates the degree to which consumers take an active role in managing their health and health care (Hibbard et al., 2004). The PAM has 13 items and uses a Guttman-like scale, scored on a theoretical scale of 0-100, which may be categorized into four levels of activation, with Level 4 the most activated (Hibbard & Greene, 2013; Nijmana et al., 2014). Hibbard et al. (2004) did extensive validation of the measure and found it to have strong psychometric properties and predictive abilities.

Assumptions

All quantitative research studies have assumptions, best categorized as (a) philosophical/scientific, (b) methodological, and (c) statistical. Quantitative research is guided by the scientific method, which itself is based on positivist epistemology, or the philosophy of "how we come to know" (Mertens, 2014, p. 120). Positivist epistemology assumes that science quantitatively measures independent factors about a "single apprehensible reality" (Mertens, 2014, p. 121). Quantitative research is also driven by deductive reasoning, that is, using "top down" reasoning from the general—theory—to the specific—the testing of theory via study hypotheses (Mertens, 2014). Quantitative studies are based on the assumptions that the world is knowable through data, that data are objective, and that data can be used to test theory (Mertens, 2014). To that end, there is an inherent assumption that the data used in a quantitative study have been reported truthfully and that the statistical analyses have been conducted and reported appropriately and ethically (Mertens, 2014).

One primary methodological assumption was that participants would be honest and forthcoming when answering the study survey. Results of studies can be profoundly influenced by the social desirability bias, that is, the tendency of participants to provide answers that the individual perceives as being socially appropriate and acceptable (DoDou & deWinter, 2014). Research has shown that "social desirability is inversely related to the degree of privacy and anonymity that a person experiences" (DoDou & deWinter, 2014, p. 1). The degree of privacy and anonymity is enhanced in this study's

methodology of gathering data via an online survey where the participants have no contact with and cannot be identified by the researcher or other individuals in the study.

The last set of assumptions pertained to statistical assumptions. The researcher utilized multiple linear regression for moderation to answer study questions. Multiple linear regression has numerous assumptions that need to be met for valid interpretation of results. These assumptions are that (a) data are reliable and show normality, (b) there is a lack of multicollinearity between the independent and moderating variables, (c) data display linear and homoscedasticity in their relationships, and (d) there is independence of errors. Various statistical tests were performed to determine if these assumptions were met, and any violations to assumptions were statistically addressed. This is discussed in more detail in Chapter 3.

Scope and Delimitations

This study had a number of delimitations. The scope was determining if a relationship exists between patient financial literacy and patient engagement. Participants in this study were limited to those with health insurance given the need to assess the impact of patient financial responsibility based on a person's deductible. Because of the large number of potential participants in the study population, the study focused only on a random sample of participants from an Internet panel. Data were collected during a limited timeframe of 2 weeks to ensure timely completion of the required analysis.

Limitations of Study

Study limitations are circumstances or characteristics of the research that impact the application of the study results or constrain generalizability. This study had a number

of limitations. First, the sample was taken from an online panel. Although diverse in many respects, the panel may have been limited or incomplete given that not all patients may have had online access to the questionnaires. Because of this data collection method, an analysis of non-respondents was not feasible. Second, the data collected in this study were self-reported, and, as such, could not be independently verified. Data that are self-reported may be biased for a number of reasons, including: selective memory or the respondent not accurately remembering what actually happened, confusing the timing of when events occurred, tending to remember more positive situations or circumstances than negative, and exaggeration or embellishing what happened (Brutus, Aguinis & Wassmer, 2013). Finally, since this study data set was cross-sectional and based on a correlational design, it may not have been possible to establish causality between the independent and dependent variables. Further research may be needed to address these limitations and confirm research results in a wider range of settings and populations.

Potential Significance of the Study

There are many benefits of this research to the healthcare profession. Xiao, Tang, and Shim (2009) found that positive financial management behaviors are associated with physical health, mental health, academic success, and life satisfaction among survey participants. Carman et al. (2013) noted that emerging evidence suggests that patient engagement can be a pathway toward achieving the goals of better quality of care, greater cost efficiency, and improved population health. However, many individuals are "less than fully proficient consumers" of health care and tend to have "lower than proficient levels of financial literacy" regarding health care costs (Braun et al., 2010, p. 52). Low

financial literacy may limit patient engagement, which could then limit needed health care services and negatively impact health outcomes (Braun et al., 2010; James et al., 2012) and could furthermore add to the "growing societal problems caused by poor consumer decisions about financial services" (Huhmann & McQuitty, 2009, p. 272).

Health care legislation such as the Affordable Care Act (ACA) and the financial legislation such as the Dodd-Frank Act have spurred changes for patients and consumers and society overall. The ACA has not only added more consumers to the insurance ranks but also spurred changes to the health care model in the United States (Betancourt, 2014). The focus for health care providers has shifted from one of service volume to one focused on value or outcomes (Betancourt, 2014). Improving health care outcomes requires more patient engagement (Hibbard & Greene, 2013). The Dodd-Frank Act established the Consumer Financial Protection Bureau (CFPB, 2015) to protect consumers, promote financial education, and research consumer behavior (CFPB, 2015). The CFPB mission highlights the need for ensuring consumers receive the information they need to make the best financial decisions (CFPB, 2015). Grover (2015) noted that recent moves by the CFPB, "indicate that the CFPB is starting to see itself as a central planner rather than just an enforcer for consumer finance law and industry watchdog" (p. 1). These efforts have heightened awareness of the need to increase the general financial literacy of consumers, including in the context of health care decision making.

To summarize, increasing patient engagement has been shown to improve health outcomes (Harvey et al., 2012; Remmers et al., 2009; Skolasky et al., 2011). Financial literacy has also be linked to improved health outcomes (Braun et al., 2010; Huhmann &

McQuitty, 2009), as has shared decision making (Elwyn et al., 2010). Improved health outcomes are the result of facilitating behavior change, providing opportunities to engage in healthy behavior, or developing innovative delivery systems (Hibbard & Greene, 2013). All of these effects have implications for social change and are the reasons this dissertation topic was selected.

Summary

Previous research has found that patient engagement contributes to higher quality health care. Patient engagement focuses on patients being more actively engaged in managing their own health and care. While many researchers have examined patient engagement, including the impact of health literacy, few have examined the relationship between financial literacy and patient engagement. Therefore, the purpose of this quantitative research was to determine if a relationship exists between patient financial literacy and patient engagement. Theories used to provide conceptual context for the dissertation topic include Shim's (2010) cultural health capital (CHC) theory and Bourbeau's (2008) self-management model. A correlational design was used to assess the relationship between patient financial literacy and patient engagement. Given the importance of patient engagement and factors that affect it to improved health outcomes, this research project had important implications for social change.

Chapter 2: Literature Review

Background of the Problem

Since 2013, health care reform legislation has resulted in more than eight million new consumers joining the ranks of the insured (DHHS, 2014). Many of these new consumers must now learn what it means to have health insurance, especially the costs associated with insurance-based health care (Kim, Braun, & Williams, 2013; Long & Goin, 2013). The change in insurance status required that new consumers build their cultural health capital, that is, their efficacy in effectively engaging with the medical community and being financially responsible with regard to health care costs (Barcellos et al., 2014; Long, 2013).

Patient engagement, also known as patient activation, emphasizes patients taking on a larger role in managing their health and care (Hibbard & Greene, 2013). The problem addressed in this study is that while patient engagement has received much research attention (Barello, Graffigna, & Vegni, 2012; Carman et al., 2013; Center for Advancing Health, 2010; Hibbard & Mahoney, 2010; Institute of Medicine, 2011), including its relationship to health literacy (Coulter, 2011; Hibbard, Greene, & Overton, 2013), little research has examined the relationship between financial literacy and patient engagement. A lack of understanding of the linkages between financial literacy and patient engagement could limit needed health care services and negatively impact health outcomes (Braun et al., 2010; James et al., 2012) and could furthermore add to the "growing societal problems caused by poor consumer decisions about financial services" (Huhmann & McQuitty, 2009, p. 272).

The purpose of this research was to determine if a relationship exists between patient financial literacy, as measured by the FMBS (Dew & Xiao, 2011) and patient engagement, as measured by the PAM (Hibbard et al., 2005). Two aspects were measured. One was the potential effects of increased patient financial responsibility because of high-deductible health plans, measured via an item inquiring about each participant's deductible. Also evaluated as potential moderators between financial literacy and patient engagement was shared decision making between the physician and patient, measured via the SDM-Q-9 (Kriston et al., 2010). Theories used to provide conceptual context include Shim's (2010) cultural health capital (CHC) theory and Bourbeau's (2008) self-management model.

This chapter begins with a discussion of patient self-management within the health care context and a focus on the theoretical framework and application to this study. Next, financial literacy within the health care context is analyzed, financial literacy is defined, and the literature is reviewed. The chapter concludes with a discussion of the role of self-efficacy factors in the financial literacy-patient engagement process, with a discussion on the role and definition of shared decision making in health care.

Literature Search Strategy

An electronic search was conducted using the Cumulative Index to Nursing & Allied Health Literature (CINAHL) and MEDLINE databases covering the years 2004 to present. The search was done using free text terms for the research topic including *patient engagement, patient activation, health literacy, health insurance literacy,*

financial literacy, self-management, and *shared decision making*. The review covers the topics of patient engagement, patient activation, and the instruments selected.

Theoretical Models

Theories used to provide conceptual context for the dissertation topic include Shim's (2010) CHC theory and Bourbeau's (2008) self-management model. Shim presented CHC as a set of culture skills and competencies that may lead to better health care relationships. Shim (2010) proposed CHC as a theoretical framework for linking culture skills and competencies to broader social inequalities present in health care relationships and encounters. Evaluation of financial literacy as part of these competencies fits within the CHC framework. CHC develops as patients seek medical information, exercise decision making, and engage in self-surveillance (Shim, 2010). Shim proposed that patients now need a range of cultural competencies to maximize the benefit of their health care. As the name implies, CHC is a form of capital, as its competencies are utilized via clinical interventions (Shim, 2010) (see Figure 1).

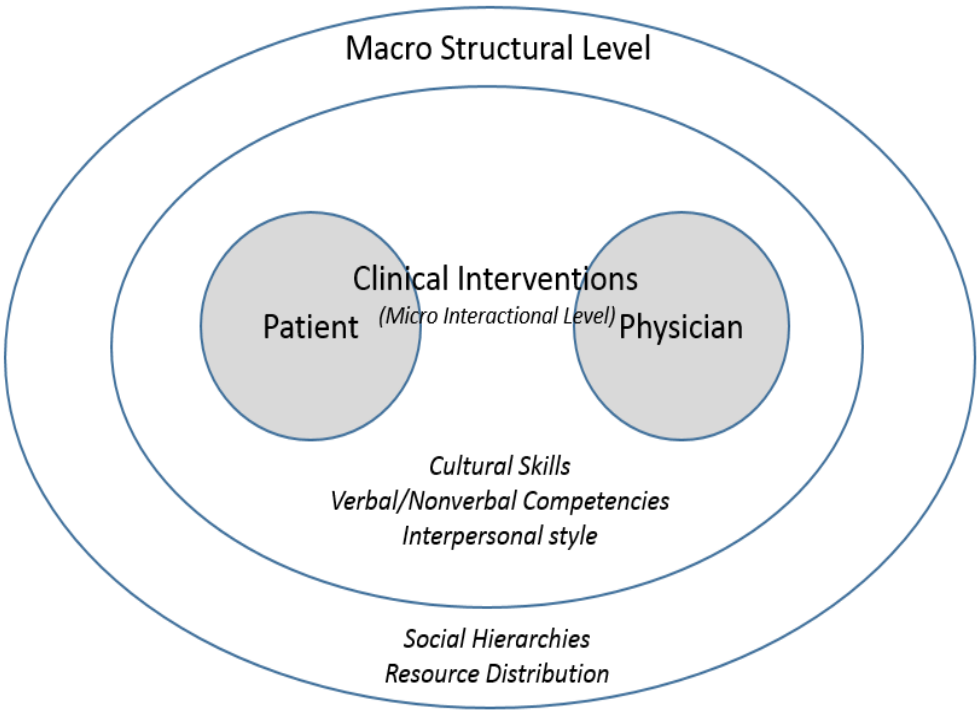

Figure 1. Cultural health capital framework (Shim, 2010).

Part of the CHC framework also focuses on the patient characteristics that may affect the exchange of information between patients and providers. Health literacy is one of the characteristics mentioned and is considered critical to basic communication in the health care process (Shim, 2010). Certain health care scenarios also require an understanding of financial impacts; this is where evaluating financial literacy may be important. A key finding is that inadequate health literacy, and potentially financial literacy, is found predominately among those with a lower socioeconomic status (Shim, 2010). Therefore, there are implications for understanding social inequities and engendering social change as well.

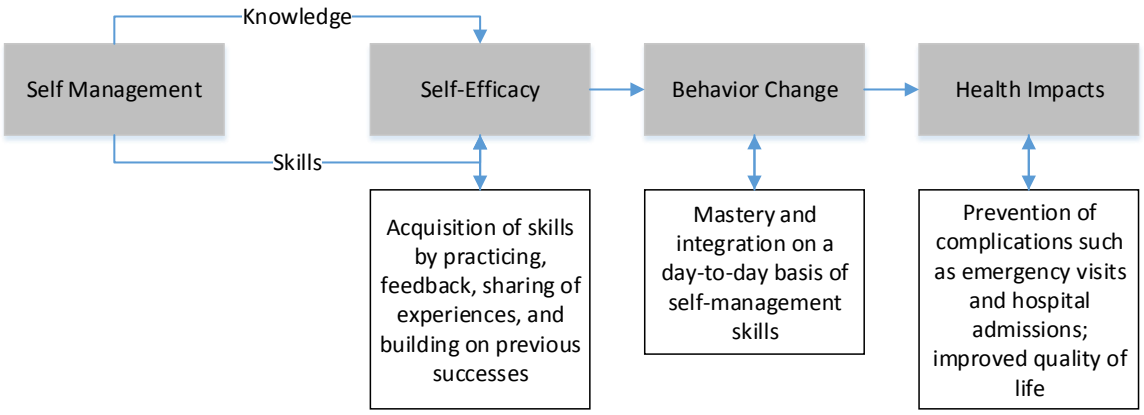

Figure 2. Patient self-management model for health care (Bourbeau, 2008).

Bourbeau (2008) proposed a self-management model based on three primary characteristics: disease management, problem-solving and patient self-efficacy, and the partnership between patients and health care professionals to address health care situations (Bourbeau, 2008) (see Figure 2). Bourbeau (2008) saw the model as a way of ensuring patient engagement in health care situations, particularly disease management. Financial obligations for health care could be one such health care situation. Operant behavior and social cognitive theory are the basis for the process model of self-management, and behavior consequences lead to behavioral outcome expectations (Bourbeau, 2008). This model could be applied to financial literacy and patient engagement, where being more financially literate leads to deeper engagement with health care outcomes.

Self-efficacy relates to how much a patient believes he or she can respond to or take action, in this case, as needed in health care situations, including disease management (Bourbeau, 2008). Patients also need to take action regarding the financial

implications of health care decisions and services. Bourbeau (2008) found self-efficacy is a major factor that promotes self-management skills. Self-management occurs when patients engage in specific self-care behaviors to better manage the disease impact. The intent is to encourage active participation where patients communicate concerns and priorities to health care professionals (Bourbeau, 2008).

Patient Self-Management Within the Health Care Context

Provider choice is an important issue, not only in relation to health policy but also given its ties to patient self-management. Rademakers et al. (2013) studied the impact of health literacy and patient activation on provider choice in the Netherlands. A study sample of 2,000 adults was drawn from the Dutch Health Care Consumer Panel of NIVEL, the Netherlands Institute for Health Services Research. A mix of an online and written questionnaire was sent to sample members, resulting in a 75% response rate (Rademakers et al., 2013). The majority of respondents (59.6%) relied on the recommendation of their primary care physician for specialist referrals and hospitals (Rademakers et al., 2013). Health literacy and PAM scores were weakly associated (Kendall's tau $b = 0.161$, $p < 0.001$) while there were strong associations between health literacy and educational level (Kendall's tau- $b = 0.203$, $p < 0.001$), and between patient activation and educational level (Kendall's tau-b: 0.118, $p < 0.001$). Analysis also showed patients with lower literacy levels and lower patient activation levels were less likely to make a provider choice with high education ($b = 2.6$, $p < 0.05$), gender ($b = 1.47$, $p < 0.05$), and patient activation ($b = 1.65$, $p < 0.05$), which were the most significant predictors based on logistic regression (Rademakers et al., 2013). Thus,

literacy levels and, potentially, financial literacy might affect provider choice and, ultimately, self-management and engagement.

Health literacy and patient activation are both important measures in relation to self-management for health care. Smith et al. (2013) evaluated the association between the two constructs, as well as the combined and independent associations with physical and mental health. In this study, a large sample of older adults participated in face-to-face interviews where the test of functional health literacy in adults (TOFHLA), the patient activation measure (PAM), the SF-36 physical health summary subscale, and patient reported outcomes measurement information service (PROMIS) short form subscales for depression and anxiety were completed (Smith et al., 2013). Based on Pearson correlations, there was a weak relationship between patient activation and health literacy *(r* = 0.11, $p < 0.01$) (Smith et al., 2013). Additionally, low health literacy was associated with worse physical health ($\beta = 0.13$, $p < 0.001$) and depression ($\beta = 20.16$, $p < 0.001$), while lower patient activation was associated with worse physical health, depression, and anxiety (Smith et al., 2013). Lower SES individuals were less activated (Smith et al., 2013). Given the link between literacy and patient activation, financial literacy may also impact patient activation. The authors concluded that interventions designed to increase patient activation may be a helpful to addressing socioeconomic inequalities (Smith et al., 2013).

Medicaid patients who typically have lower socioeconomic status can account for a high percentage of care and costs. This trend has resulted in a shift to plans and programs that can help manage these patients more effectively. Raven et al. (2009)

focused on developing a methodology for identifying high-risk Medicaid patients, patients at risk for future admissions, as well as related factors to use to target interventions for this population. High rates of substance use, homelessness, social isolation, and lack of primary care were the main factors driving the model concluding that interventions should be used to address these areas (Raven et al., 2009). Interventions to increase literacy particularly health and financial literacy may be an option.

Financial Literacy Within the Health Care Context

Since 2010, marketing and economic research has increasingly focused on financial literacy, much of it in response to the national financial crises of the late 2000s and the affordable care act of 2009 (Hastings, Madrian, & Skimmyhorn, 2013). Financial literacy has garnered much research attention in the field of higher education, with a focus on developing effective financial literacy programs to help address the growing student debt concerns emerging in 2008 (Finke & Huston, 2014; Long & Goin, 2014; Long, 2013). Both fields of literature have recognized the societal importance of financial literacy, especially in consideration of "the changing economic climate in which individuals now shoulder greater personal financial responsibility in the face of increasingly complicated financial products" (Hastings et al., 2013, p. 347).

The "changing economic climate" resulting from health care reform has increased the relevance and importance of financial literacy and consumer behavior as it relates to health care (Hasting et al., 2013, p. 347). In this section of the chapter, I will review definitions and the literature on health, health insurance, and financial literacy. Key

findings on research on financial literacy in the health care context are included and evaluated in the context of the research for this project.

The definitions of financial literacy. Financial literacy is a relatively new construct emerging from the work of Brobeck (1990, 1991, 1993, 1998, as cited in Hastings et al., 2013), who defined it as the ability "to manage one's financial resources effectively for lifetime financial security" (p. 348). While other definitions of financial literacy do not greatly vary from Brobeck's (1990) original conceptualization, these definitions are often dependent upon the field, context, and focus of the research. Braun et al. (2010), for example, defined financial literacy within the context of health care, and postulated that its definition includes three components that assess (a) financial knowledge, e.g., "being … informed on issues of managing money and assets, banking, investments, credit, insurance, and taxes; (b) financial concepts "underlying the management of money and assets;" and (c) use of financial knowledge "to plan and implement financial decisions" (p. 52).

According to Huhmann and McQuitty (2009), financial literacy is having sufficient knowledge about financial concepts and products. These authors posited that financial literacy was one component of *financial numeracy*; the other is *financial capacity*, or the ability to process and comprehend information related to financial products (Huhmann & McQuitty, 2009). Financial capacity is learning-based and ties at least in part to cognitive capacity and ultimately affects financial management outcomes (Huhmann & McQuitty, 2009). Huhmann and McQuitty (2009) proposed a theoretical model outlining cultural and psychographic variables that were likely to affect financial

numeracy. Huhmann and McQuitty noted that cultural and psychographic differences may affect consumers in different ways; for example, culture influences the use and perception of financial products. For the purposes of this research, financial literacy will be defined as having sufficient knowledge about financial concepts and products in the health care context.

Financial literacy has often been assessed via measures that assess financial numeracy alone or in combination with items assessing other financial constructs. Huston (2010) found that a standardized instrument for measuring financial literacy has not yet been developed given the lack of a consistent definition. More recently, Bennett et al. (2012) utilized a scale of financial literacy that contained items on financial numeracy as well as financial information and financial concepts. James, Boyle, Bennett, and Bennett (2012) conducted one of the few studies that examined whether financial literacy predicted decision making regarding health care insurance plans. The authors measured financial literacy using a 23–item scale assessing individual knowledge and skills as they pertained to financial numeracy and "the ability to perform simple monetary calculations" (James et al., 2012, p. 533). The authors concluded that improvements in literacy facilitate better decision making as it relates to making savvy decision regarding health care insurance, and they furthermore posited that financial literacy could lead to better health outcomes in later years (James et al., 2012).

Dew and Xiao (2011) developed the Financial Management Behavior Scale (FMBS) to measure the different domains used by consumers to manage their finances. The FMBS scale was validated using a nationally representative sample of adults and

highly associated with other measures of financial management behaviors and was predictive of participants' actual levels of savings and consumer debt (Dew & Xiao, 2011). Thus, the FMBS provides a good proxy for financial literacy.

Review of the literature: Health literacy. Literacy is a broad concept with multiple dimensions, including financial, health insurance and health, required for consumers to function successfully in society. Health literacy is represented by how consumers utilize health information in order to make health care decisions (Institute of Medicine, 2011). Adults whose primary language is not English (Rudd, 2007) and who have lower cognitive ability, educational, and occupational levels (Mõttus et al., 2014) tend to have lower literacy skills and ultimately poorer health. Eichler, Wieser, and Brugge (2009) found that limited health literacy added 3-5% to health care cost per year at the health system level and resulted in additional expenditures $143 to $7,798 annually. Studies have found health literacy influences healthy behavior, which interacts with health status, itself strongly affected by age (Sun et al., 2014). Education has a strong and positive effect on health literacy, while age has a strong and negative relationship (Sun et al., 2014).

Hibbard, Peters, Dixon, and Tusler (2007) noted that more emphasis is being placed on consumers to address health care cost and quality problems; as a result, more information should be provided to allow for more informed and cost effective choices. New skills such as health numeracy or the ability to process numerical concepts are important predictors of health information use and comprehension (Hibbard, Peters, et al., 2007). The authors found that numeracy skill ($\beta = .467$, $p < 0.001$) and health literacy

(β =.310, $p < 0.01$) were the highest predictors of comprehension, while activation mitigates the effects of lower skills in both areas (Hibbard, Peters, et al., 2007). Further research by Wood et al. (2011) tied performance on a range of health and financial tasks to numeracy ability with differences in numeracy ability resulting in different approaches to decision making. Thus, health literacy and numeracy are important to consider in regard to health policy decisions affecting health care. Other researchers have expanded the skills required for health literacy, including problem solving, decision making, critical thinking, information seeking, and communication (Mancuso, 2009). Baker (2006) found health literacy to be dynamic, evolving over time and influenced by other socioeconomic and cultural factors.

Health literacy has been considered both a risk factor that needs to be identified and managed (or screened) as well as an asset which results from health education and communication (Nutbeam, 2008). Nutbeam's model of health literacy (2000, 2009) outlined three levels with corresponding goals:

1. The functional level, focused on basic reading, writing, and literacy skills, which allow for knowledge of health conditions and systems.
2. The communicative level, which includes communication and social skills that can evaluate different forms of communication, applying new information as needed.
3. The critical level, which includes cognitive and social skills required to analyze information and use information to impact one's own life and health.

Health care insurance literacy. Within the health care literature, health insurance literacy, the ability of consumers to navigate the health insurance system, has been used as a proxy for financial literacy (Kim, Braun, & Williams, 2013; Long & Goin, 2013; McCormack, Bann, Uhrig, Berkman, & Rudd, 2009). Indeed, there is a robust body of literature on health care insurance literacy, much of it focusing on the implications of the Affordable Care Act of 2009 (see, e.g., Barcellos et al., 2014; Long, 2013). This body of research has consistently shown that (a) Americans, especially young adults, have poor health care insurance literacy; and (b) increased health care insurance literacy is significantly predictive of proactive and beneficial health care behaviors and attitudes. McCormack et al. (2009) approached the concept of health insurance literacy differently by positing that health insurance literacy was a "dimension of health literacy" (p. 225). The authors provided a conceptual framework that denoted interactive association between cultural and demographic factors (e.g., age, ethnicity, and education), financial literacy, and health outcomes, including health insurance literacy. Health insurance literacy as well as a person's experiences with the health care system influence decision making and ultimately health outcomes (McCormack et al., 2009).

Review of the literature: Financial literacy in health care. A review of the literature yielded only two studies (Bennett et al., 2012; James et al., 2012) that examined the relationship between financial literacy and health-related behavior, attitudes, and outcomes. Bennett et al. (2012) examined the relation of health and financial literacy with health promoting behaviors among community-based older persons. Participants were selected from the Rush Memory and Aging Project and clinical evaluated for

dementia, resulting in a sample of 556 participants (Bennett et al., 2012). Health literacy was assessed with a series of nine questions on topics such as understanding Medicare, medication instructions, and common causes of death in the elderly. Financial literacy was assessed with a series of 23 questions mostly adapted from the Health and Retirement Study (Bennett et al., 2012). Questions covered numeracy, financial concepts, and knowledge of financial terms and institutions. Bennett et al. (2012) assessed three components of health promoting behavior: (a) cognitive activity, which was "participation in … cognitively stimulating activities" such as reading the newspaper or playing chess; (b) physical activity, such as exercising or doing yard work; and (c) social activity, such as spending time with friends and family (p. 3).

Results from the study showed that health literacy significantly correlated with financial literacy, $r = 0.46$, $p < .001$, but were not collinear: these two constructs were similar to one another but assessed distinctly different literacy constructs (Bennett et al., 2012). Results from a hierarchical multiple linear regression, controlling for demographic variables, showed that while both health and financial literacy predicted cognitive activity, the predictive association was stronger for financial literacy ($\beta = .08$, $p = .001$) than health literacy ($\beta = .04$, $p = .016$). Results further showed that health literacy but not financial literacy predicted physical and social activity. This result suggests that financial literacy may be more likely than health literacy to have more of an influence on cognitive aspects of health promoting behaviors (Bennett et al., 2012).

Both the Bennett et al. (2012) and James et al. (2012) studies provide good context around the importance of literacy and health behaviors, outcomes and decision

making. While Bennett et al. (2012) found total literacy was associated with more frequent participation in health promoting behaviors and James et al. (2012) found total literacy positively associated with decision making, neither study assessed the impact of patient engagement as part of the process. However, Hibbard, Greene, and Overton (2013) found a relationship between patient activation and lower health care costs while Hibbard and Greene (2013) found a relationship between patient activation and better health outcomes; however, neither study addressed health and financial literacy.

Patient Engagement

Patient engagement has been at the forefront of health care reform and research since the publication of the Institute of Medicine's (2001) *Crossing the Quality Chasm* report, in which the Institute recognized patient-centered care as one of the six national health care reform strategies (Kupfer & Bond, 2012). Patient engagement has been recognized as a "critical catalyst" to reform movements in health care and is at the center of patient-centered care (Couto & Comer, 2012, p. 209). Patient engagement is necessary to the implementation of patient-centered care practices, which include not only the "coordination and integration of" personalized care but also the provision of financial information and education and shared decision-making about health care between the patient and physician (Couto & Comer, 2012; Coulter, 2012; Kupfer & Bond, 2012). Research has also found that high-quality health care depends on successful patient engagement (Center for Advancing Health, 2010).

Definition of patient engagement. A broad spectrum of terms and definitions of patient engagement have been proposed. Coulter (2011) provided a definition that

focused on patients and health care providers working together to make better health care decisions. This definition was further refined to focus on the three areas of health literacy, shared decision making, and quality improvement and a list of promising interventions proposed in each area (Coulter, 2012). Carmen et al. (2013) expanded the definitions of patient engagement to include others beyond the patient who are critical to the care process – both families and health professionals – and across the health system at the direct care, organizational, and policy-making levels. A multidimensional framework plots levels of engagement (direct care, organizational design and governance, and policy making) by a continuum of engagement (consultation, involvement, and partnership/shared leadership), which can be moderated by other factors (Carmen et al., 2013). Carmen et al. (2013) found that the framework highlighted the extent of patient involvement in decision making and the need for implementing interventions across multiple levels of engagement. Other definitions of patient engagement have provided a behavior framework and focused on a patient engagement as the actions patients take with regards to their health and health care (Center for Advancing Health, 2010). In a review of the literature on patient engagement, Barello et al. (2012) observed the increased attention being paid to patient engagement, but the authors noted a lack of evidence on the construct's theoretical foundations as well as potential dimensions that contribute to it.

Hibbard and Greene (2013) found that patient activation is often used as a proxy for patient engagement, and that activated patients often have better health outcomes and care experiences. Patient activation refers to how well a patient understands the need to

be involved in his/her health care and is capable of doing so (Hibbard, Mahoney, Stockard, & Tusler, 2005). Activation is typically measured via the PAM and represented in four stages: "(1) believing the patient role is important, (2) having the confidence and knowledge necessary to take action, (3) actually taking action to maintain and improve one's health, and (4) staying the course even under stress" (Hibbard, Stockard, Mahoney & Tusler, 2004, p. 1005). Hibbard and Greene (2013) found that activation can be increased over time and certain interventions can be used to build skills to support activation while Shivley et al. (2013) found targeted interventions improve patient activation in heart failure care. Hibbard, Peters, et al. (2007) found that more activated patients are likely to understand the consequences of their own health choices and may be more motivated to make high quality choices. These findings highlighted the need for a systematic approach, particularly in terms of quality improvement, to encourage patients to be more activated (Hibbard & Greene, 2013).

Patient engagement in health care: A review of the literature. Health care delivery is focused on delivering value which translates to the specific goals of better health for individuals and populations delivered at a lower cost. Patient engagement is an important step in this process. Patient activation was first defined by Hibbard et al. (2004) as a measure of the extent to which patients have the knowledge and skills to actively manage their own health care. More recently, Hibbard and Greene (2013) focused on defining effective strategies for activating patients as well as determining if disengaged patients can move towards being activated. The authors documented numerous studies that show highly activated patients achieve better care experiences

particularly with a specific provider recognizing the importance of patient participation in shaping the provider-patient relationship. Hibbard and Greene also identified that interventions can be used to increase patient activation if focused in the area of developing skills, problem solving or peer support, changing the social environment to facilitate changes to more closely match patient's beliefs and social norms, and encouraging people to take action based on tailored coaching highlighting the need for a systematic approach. The authors also highlighted work in innovative care delivery systems to use patient activation as a step towards improved care ensuring a systematic approach to expand the patient's participation in the care process (Hibbard & Greene, 2013). This research is significant given its focus on showing that patient activation is a process where interventions and participation can increase activation and ultimately lead to better care.

Patient activation is a part of the chronic care model which includes patients and their families as part of the care team. Activation has been defined as a series of steps through which patients may progress (Hibbard et al., 2004). Hibbard, Mahoney, et al. (2007) attempted to determine whether activation can change and if changes in activations result in changes of behavior. The authors conducted a clinical trial using the Chronic Disease Self-Management Program (CDSMP) to further research this area. Results of the study showed that activation positively increased across levels and at different trajectories based on a variety of self-management behaviors (Hibbard, Mahoney, et al., 2007). Based on the results of this research, the authors concluded that patient activation can be used to assess individual patient progress over time as well as to

monitor and/or segment patient populations, targeting interventions by segment (Hibbard, Mahoney, et al., 2007). This research is significant as it outlines how patient activation can be used to assess patient progress towards improved behavior and ultimately better health.

Previous research has also demonstrated that activation level is predictive of a range of health behaviors (Harvey, Fowles, Xi & Terry, 2012; Remmers et al., 2009, Skolasky et al., 2011). While patient engagement has received considerable research attention, with numerous studies being published on the topic since 2008, less research attention has been given to financial constructs including financial literacy that may influence patient engagement behaviors. The body of research that does exist has focused more on health care costs and patient engagement. Such was the focus of Hibbard, Green, and Overton (2013), who utilized electronic health care data from 33,163 patients in Minnesota to examine the relationship between patient engagement and cost of inpatient and outpatient care. The authors utilized the PAM as an ordinal measure of patient engagement, with participants being placed into four levels of engagement. Using logistic regression analyses and controlling for demographic variables, Hibbard et al. found that patients in the lowest level of patient engagement incurred health care costs "that were 8 percent higher than those of patients with the highest level of activation" (p. 219).

Patient activation has also been researched in relation to health literacy and found to be a distinct concept with different contributions (Greene, Hibbard, & Tusler, 2005; Nijmana et al., 2014). Greene et al. (2005) found that there may be multiple dimensions

to the consumer choice and decision making processes requiring different skills and efforts. Hibbard, Peters, Dixon & Tusler (2007) noted that those patients who were more activated are better able to use comparative information even when they have lower numeracy and literacy skills. Thus, activation may be a proxy for motivation (Hibbard et al., 2007). Hibbard et al. (2013) found that patient activation was a significant predictor of health care cost as patients' ability and motivation to manage their health is an important component to health care providers' ability to improve care and lower costs. Certainly, these are important challenges that must be addressed in today's health care environment.

Risk-Reduction Factors and the Financial Literacy-Patient Engagement Process

In response to the American health care reform movement of the late 2000s, there has been an increasing organizational and empirical focus on patient "socially-transmitted and differentially distributed" risk reduction practices that may affect the patient-practitioner relationship (Shim, 2010, p. 1). Two risk-reduction factors that have become increasingly important under the 2010 health care reform law, coupled with rising health care costs, are patient financial responsibility for out-of-pocket health expenses and shared decision making (Mayer, 2014; O'Kane et al., 2012). Organizations such as the National Academy of Sciences (O'Kane et al., 2012) are among the many national health care organizations with leaders who have advocated for changes in health care policies to address the growing concern of health care expenses, and they recognize that "patient-centered care" involving shared decision-making may help to reduce such costs.

Much of the national health care advocacy work has been informed by the theoretical work of Shim (2010) and Bourbeau (2008). Both theorists framed the constructs of financial responsibility for out-of-pocket health care costs and shared decision making as behavioral manifestations of patient self-efficacy (Bourbeau, 2008; Shim, 2010). In Shim's (2010) CHC theory, patient financial responsibility and shared decision-making were two cultural health capital factors that could play a role in health care disparities. Bourbeau's (2008) framework was more complex. In Bourbeau's (2008) framework, patient financial responsibility and decision making interacted between patient self-management practices (e.g., financial literacy) and patient behavior change (e.g., increased patient engagement). Both models provide excellent frameworks to examine the moderating effects of patient financial responsibility for out-of-pocket expenses and shared decision making between patient financial literacy and patient engagement.

Definition and role of patient financial responsibility. Patient financial responsibility is, in its strictest definition, honoring one's out-of-pocket health care costs (Ubel, Abernathy, & Zafar, 2013). In the context of receiving health care services, patient financial responsibility is primarily based on the insurance deductible. A high deductible health plan is a health plan with an annual deductible that is not less than $1,300 (in 2015) for self-only coverage (IRS, 2014). Many of the newly insured have chosen high deductible health plans (HDHP) via the health exchanges for their potential cost savings, especially with regard to affordable premiums (Galbraith et al., 2010). High deductible health plans are also the only affordable health care plans for individuals with chronic

health issues (Galbraith et al., 2010). America's Health Insurance Plans (AHIP) reported enrollment in high deductible health plans totaled 17.4 million in January 2014, with an average annual growth rate of 15% since 2011 (AHIP, 2014). Thus, there are more individuals with increased patient financial responsibility receiving health care services today.

The increasing patient burden of health care costs has even led cancer researchers to define a new term, *financial toxicity* (Ubel et al., 2013; Zafar & Abernathy, 2013). As stated by Zafar and Abernathy (2013) wrote, "Out-of-pocket expenses might have such an impact on the cancer experience as to warrant a new term: 'financial toxicity.' Out-of-pocket expenses related to treatment … diminish quality of life and impeded delivery of the highest-quality care" (p. 81).

Research, especially work done by Galbraith and colleagues (e.g., Galbraith et al., 2011; Kullgren et al., 2010; Lieu et al., 2009; Penfold et al., 2011) has documented that, contrary to expectations, HDHP membership and the resultant patient responsibility for health care costs can have debilitating financial consequences for the individual and his or her family. High out-of-pocket expenses have led some individuals—especially those with chronic conditions and/or who are of low-income status—to forego needed medical treatment and to drastically reduce expenditures on food and medications, which can further exacerbate health care problems (Galbraith et al., 2011; Kullgren et al., 2011; Penfold et al., 2011). Ultimately, HDHPs can lead to higher hospital and physician costs and increased bad debt among consumers, consumer financial concerns that are exactly

what HDHPs were supposed to help reduce (Galbraith et al., 2011; Kullgren et al., 2010; Lieu et al., 2009; Penfold et al., 2011).

Patient financial responsibility in health care: A review of the literature. A small but growing body of research has examined the implications of patient financial responsibility for out-of-pocket expenses with regard to financial literacy and patient engagement. In one of the few studies on financial literacy and health care financial responsibility, Bauhoff, Carman, and Wupperman (2013) found that financial literacy was lowest among "the population eligible to receive subsidies and most likely to enroll in the exchanges" (p. 12). Poor financial literacy among consumers has been significantly associated with poor financial behaviors with regard to health care in studies by Greene, Peters, Mertz, and Hibbard (2008) and Robb and Woodyard (2011). Greene et al. (2008), in an experimental study with 303 health care consumers, examined potential financial literacy differences with regard to consumers' understanding and use of HDHPs. The authors found that participants with lower levels of financial literacy in comparison to those with higher levels of financial literacy reported significantly lower levels of comprehension and ease of understanding of their HDHPs, and yet they were more likely to select a HDHP over other health care plans. In a survey study with 1,488 study participants, Robb and Woodward (2011) found that lower levels of financial literacy was significantly predictive of lower use of financial best practices, inclusive of not having a quality health care plan and a health care emergency fund . These studies suggest that low levels of financial literacy can result in not only poor awareness and

understanding of health care costs but also engagement in poor financial behaviors as they pertain to health care.

Several studies (see, e.g., Lieu et al., 2009; Yegian et al., 2013) have shown that factors surrounding patient engagement, such as individuals' beliefs about their roles as patients, can play a role in consumer's understanding of their financial responsibilities for their health care. Yegian et al. (2013) analyzed why patient engagement remains low with regard to awareness and usage of health care quality and cost data by consumers. One of the key reasons for this was that out-of-pocket expenses declined for 3 years between 2006 and 2009; thus, consumers had little motivation to be actively involved in addressing the quality and cost implications of their health care decisions (Yegian et al., 2013).

Studies have also documented situations in which patient engagement is lacking with regard to HDHPs and patient financial responsibility. Lieu et al. (2009), in a qualitative study with 21 health care consumers, identified three situations that incurred additional out-of-pocket costs that could have been improved via increased patient engagement practices: (a) medical emergencies that created a sense of "urgency and fatalism" and led consumers "to seek health care without prior knowledge of the financial consequences"; (b) medical services that consumers thought were covered by their insurance; and (c) the reluctance of consumers to discuss health care costs with their physician (p. 251). Researchers (e.g. Lieu et al., 2009; Loewenstein et al., 2013; Penfold et al., 2011; Yegian et al., 2013) have set forth recommendations to increase patient engagement practices with regard to consumer management of out-of-pocket expenses

for their health care. These recommendations include simplifying health care cost information so that it is more accessible and understandable to consumers. Having this specific information should lead to more engaged consumers who make well-informed heath care decisions (Loewenstein et al., 2013; Penfold et al., 2011; Yegian et al., 2013).

An additional recommendation by researchers (Lieu et al., 2009; Penfold et al., 2011; Sommers et al., 2013; Yegian et al., 2013) is to enhance patient-physician shared decision-making practices. Shared decision making between health care providers and patients has been proposed as a more transparent way to control costs while allowing patients to have more impact on actions that affect their own out-of-pocket expenses (Sommers et al., 2013). Sommers et al. (2013) found that consumers were generally unwilling to consider costs when making comparable health care treatment decisions. In fact, research participants were found to be inexperienced in thinking about cost options and tradeoffs and were generally disinterested in making such decisions and unaware of how personal finances could affect their health status (Sommers et al, 2013). Furthermore, research participants stated that they preferred their physician to make such decisions (Sommers et al, 2013). Such findings pose a challenge to health policies that seek to engage patients more in their health care decisions. The authors proposed that this challenge be addressed through interventions, such as financial literacy education, to increase public awareness of the impact of decisions on health care costs (Sommers et al., 2013).

Huckman and Kelly (2013) debated the effectiveness of current public reporting efforts with regards to consumers making more informed health care decisions based on

quality and cost information. Given the need to address specific patient interests and concerns, more time may be required to present and explain the information to patients, the first step in shared decision making. Huckman and Kelly (2013) noted that consumers are paying a growing share of costs given that prevalence of high-deductible health plans has grown by 24% from 2006-2012 and copayments have had similar growth. The shift towards consumerism should see patients become more involved in health care purchases in the future and cost often will be a factor (Huckman & Kelly, 2013).

Definition and role of shared decision-making. In recent years, more attention has been placed on the importance of shared decision making (SDM) in health care. Health care reform in the United States and research at the National Health System (NHS) in the United Kingdom has contributed to this attention (Elwyn et al., 2010; Scholl et al., 2011). Scholl et al. (2011) defined SDM as "an approach where clinicians and patients communicate together using the best available evidence when faced with the task of making decisions" (p. 314). The SDM process allows patients to understand various treatment options and make an informed choice (Scholl et al., 2011). The authors pointed out that a number of challenges remain regarding measurement of SDM, specifically differentiating between decision antecedents or elements that surround the decision making task, the decision process which can have multiple steps, and decision outcomes both positive and negative. There can also be differences of opinion as to what constitutes good or effective decision making. The research analysis showed that patient

participation and involvement in medical decision making and its measurement is a growing research area.

Review of the literature: Shared decision making in health care. Shared decision making is a key component of U.S. health care reform, and it is often a component of patient-centered care (Mayer, 2014). Mayer (2014) highlighted the importance of shared decision making given its ability to increase patient activation, and there has been substantial evidence that shared decision making is part and parcel of patient engagement (Coulter, 2012; Hibbard & Greene, 2013; Kupfer & Bond, 2012). Indeed, the documented benefits of shared decision making on patient engagement has led to an increased research focus on decision making interventions to promote patient engagement, with research showing that such interventions enhance patients' understanding of medical treatment options as well as the risks involved in medical procedures (Coulter, 2012). Additional research work has been done on improving the assessment of shared decision making in the health care setting (Scholl et al., 2011).

There has been less of a research focus on the associations between shared decision making and financial literacy among health care consumers, with James et al. (2012) being an exception. In a study with 525 older adults participating in the Rush Memory and Aging Project, James et al. (2012) found that financial literacy was significantly associated with decision making, $\beta = .53$, $p < .001$, after controlling for income, depression, and chronic medical conditions (James et al., 2012). Improvements in financial literacy facilitate better decision making and lead to better health outcomes in later years (James et al., 2012). While some studies have suggested that financial

literacy plays a role in the decisions that consumers make regarding their health care (e.g., Hung, 2009; Kullgren et al., 2010; Loewenstein et al., 2013), a review of the literature did not uncover any additional literature that specifically examined associations between financial literacy and shared decision making.

Review of the Literature: Patient Satisfaction

Patient satisfaction has been a widely researched concept of patient perceptions of service or care with early research focused primarily on the physician setting (Kincey, Bradshaw, & Ley, 1975) and policy implications (Berkanovic, & Marcus, 1976). Patient satisfaction is measured based on several dimensions such as access, waiting times, staff competence, physician care, communications, and education and has also been tied to patient outcomes or quality of care (Bleustein et al., 2014; Urden, 2002). While many instruments were used in the past to measure patient satisfaction, the Hospital Consumer Assessment of Health care Providers and Systems (HCAHPS) has now become the standard national survey with data being publically reported to emphasize the importance of quality improvement (Centers for Medicare & Medicaid Services, n.d.).

Research has been done with regards to shared decision making and patient satisfaction (Flierler, Nubling, Kaspwer, & Heidegger, 2013; Isaac et al., 2013), with Isaac et al. (2013) linking patient outcomes to patient satisfaction scores. In a study of older adults, shared decision making was evaluated in the context of the selection of an analgesic for acute musculoskeletal pain (Isaac et al., 2013). Participants who participated in the analgesic selection decision where information was provided were more likely to report optimal satisfaction after adjusting for cofounders (Isaac et al.,

2013). Flierler et al. (2013) highlighted the importance of shared decision making and high levels of patient satisfaction in relation to anesthesia care. Out of 197 patients, 186 wished to be involved in shared decision making, with preferences being similar between patients and anesthetists (Flierler et al., 2013). Additionally, in a national sample of adults, shared decision making was positively associated with satisfaction with the decision with regards to a recent health consultation (Glass et al., 2012). Understanding information, eliciting treatment preference, and thoroughly weighing options were the three areas of shared decision making most positively associated (Glass et al., 2012). The authors concluded that once patients have the information they need, having the ability to make a choice increased satisfaction with decision.

Factors that impact communication satisfaction haves been researched. Jensen, King, Guntzviller, and Davis (2010) found that lower income adults who were younger, White, functionally literate, and pessimistic were more critical of their health care provider's communication skills. Physicians tend to be less likely to encourage interaction or provide feedback when communicating with lower social economic status (SES) patients thus, highlighting the impact provider- patient communication can have on satisfaction (Jensen et al., 2010).

Little research has been conducted on patient satisfaction, specifically in relation to patient engagement with only one study found focused on patient experience and activation levels of patients (Greene et al., 2013). Greene et al. (2013) analyzed data from 5,002 patients for 49 primary care providers and found patient activation to be associated patient experience. Patients at the highest activation level of 4 consistently

rated their primary care provider 0.4 points more positively than patients at the lowest activation level (Greene et al., 2013). The authors posited that patient experience measures seem to be shaped by the interaction or transactions between the patient and provider (Greene et al., 2013). This finding supports previous research by Dixon, Hibbard, and Tusler (2009), who suggested highly activated patients view the physician-patient relationship as a partnership versus less activated patients who viewed that role as one of compliance.

Critique of Methods

The current research was reviewed to determine if there are any methodological gaps. The majority of studies have used large sample sizes and rigorous statistics (see Appendix A for a detailed comparison table). While the PAM was utilized in numerous studies as an independent variable, few studies had used the PAM as a dependent variable, as was the case in this study. As noted previously, Huston (2010) found that a standardized instrument for measuring financial literacy has not yet been developed given the lack of a consistent definition.

Summary

The goals of this study were to determine if significant associations exist between patient financial literacy and patient engagement and if patient financial responsibility and patient-physician shared decision-making affect this relationship. Two theoretical models, Shim's (2010) cultural health capital (CHC) theory and Bourbeau's (2008) self-management model, provided the conceptual framework for this study. This review of the literature provided support for the study goals, with past research showing significant

linkages between literacy and patient engagement as well as documenting the effects of patient financial responsibility and shared decision making with regard to both constructs. Gaps in the literature have also emerged via this review. Few researchers have focused on patient financial literacy within the health care domain, especially with regard to shared decision making. More importantly, no studies were revealed that examined both shared decision making and financial responsibility as moderators between patient financial literacy and patient engagement. This study not only addressed this specific gap in the literature; it also provided additional information to the existing body of research on patient financial literacy and patient engagement.

Chapter 3: Methodology

Purpose of the Study

Given the current focus on patient engagement, as well as increasing patient financial responsibilities with regard to health care, there existed an opportunity to explore the relationship between financial literacy and patient engagement. Increasing patient engagement has been shown to improve health outcomes (Harvey et al., 2012; Remmers et al., 2009; Skolasky et al., 2011), as is the result of facilitating behavior change, providing opportunities to engage in healthy behavior, and developing innovative delivery systems (Hibbard & Greene, 2013). This chapter outlines the research design and rationale, methodology, instrumentation, and threats to validity, and closes with a summary.

Research Question & Hypotheses

The research questions and hypotheses follow:

Research Question 1

To what degree does patient financial literacy affect patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H1o. There is no statistically significant relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H1a. There is a statistically significant and positive relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 2

To what degree does patient financial responsibility due to high health plan deductibles affect the relationship between financial literacy and patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H2o. Patient financial responsibility due to high health plan deductibles will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H2a. Patient financial responsibility due to high health plan deductibles will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 3

To what degree does patient-physician shared decision making affect the relationship between patient financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults?

H3o. Patient-physician shared decision making will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H3a. Patient-physician shared decision making will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Variables

Independent Variables (IV)

Financial literacy, the independent variable, was measured by the interval-coded FMBS (Dew & Xiao, 2011). The FMBS has 15 items that are measured on a five point scale: 1 = *never,* 2 = *seldom,* 3 = *sometimes,* 4 = *often,* 5 = *always* (Dew & Xiao, 2011, p. 58). The FMBS total scale is derived by summing the 15 items; scores can range from 15 to 75, with higher scores denoting higher levels of financial literacy (Dew & Xiao, 2011). The authors also assessed psychometric properties using a nationally representative sample and found the measure to be valid and reliable (Dew & Xiao, 2011).

Moderating Variable 1

The moderating variable of patient financial responsibility was measured by having a high deductible health plan. A high deductible health plan is a health plan with an annual deductible that is not less than $1,300 (2015) for self-only coverage (IRS, 2014). This nominal variable is coded as follows: 0 = under $1300 for individual plans/$2600 for family plans, and 1 = $1300 and over for individual plans/$2600 and over for family plans.

Moderating Variable 2

The moderating variable of shared decision making was measured using Kriston et al. (2010) 9-item SDM-Q-9, which gauges the degree of physician involvement with the patient, as reported by the patient. Items on the SDM-Q-9 use a 6-point Likert-type scale, ranging from 0 = *completely disagree* to 6 = *completely agree*, and the total raw

scale scores can range from 0 to 54. Scale scores are calibrated to a transformed scale that can range from 0 and 100 by multiplying the scale score by 20 and dividing by 9 (i.e., the number of items in the scale) (Kriston et al., 2010). A higher score denotes higher levels of perceived shared decision making (Kriston et al., 2010).

Dependent Variables (DV)

The dependent variable of patient engagement was measured by the interval-coded, 13-item PAM (Hibbard et al., 2004), which indicates the degree to which consumers take an active role in managing their health and health care (Hibbard et al., 2004). The PAM has 13 items and uses a Guttman- like scale, scored on a theoretical scale of 0-100, where 0 = the lowest possible activation, and 100 = the highest possible activation (Hibbard et al., 2004). Hibbard et al. (2004, 2005) did extensive validation of the measure and found it to have strong psychometric properties and predictive abilities.

Covariates

The study survey contained nine demographic questions that are potential covariates. Spearman's rho correlation coefficients were calculated between these demographic questions and the dependent variable of patient engagement. Those demographic variables found to be significantly correlated with patient engagement (at $p < .05$) were included as covariates in the statistical analyses for hypothesis testing.

Covariate: Age. Age was measured via one question, "In what year were you born?" This question was selected as survey participants tend to more likely provide an answer with regard to their birth year as opposed to their age (Rea & Parker, 2012). Age (an interval variable) was calculated by subtracting the birth year from 2015.

Covariate: Ethnicity. Ethnicity was addressed by one categorically-coded question, "What ethnic group do you identify with?" This question is coded where 1 = American Indian/Alaskan Native, 2 = Asian/Asian American, 3 = Biracial/Multiracial, 4 = Black/African American, 5 = Hispanic/Latino(a), 6 = Native Hawaiian/Pacific Islander, 7 = White/Caucasian, 8 = other, and 9 = would prefer not to specify.

Covariate: Gender. Gender was assessed via one question that is categorically-coded: "What is your gender?" The responses are coded where 1 = male, 2 = female, and 3 = would prefer not to specify.

Covariate: Marital Status. Marital status was measured via one question, "What is your current marital status?" The responses are coded where 1 = married, 2 = living with partner, 3 = single, 4 = separated/divorced, 5 = widowed, 6 = other, and 7 = would prefer not to specify.

Covariate: Highest Level of Education. Highest level of education was assessed by one question, "What is your highest level of education?" The responses are coded where 1 = less than a high school diploma, 2 = high school diploma/GED, 3 = some college (1-2 years), 4 = Associate's degree, 5 = Bachelor's degree, 6 = Master's degree or equivalent, 7 = PhD or equivalent (MD, JD), 8 = other, 9 = would prefer not to specify.

Covariate: Current Employment Situation. Current employment situation was measured via the question, "What best describes your current employment situation?" The responses are coded where 1 = employed full-time, 2 = employed part-time, 3 = self-employed, 4 = not employed, looking for employment, 5 = not employed, not looking for

employment, 6 = receive disability benefits, 7 = retired, 8 = student, 9 = other, and 10 = would prefer not to specify.

Type of Health Insurance. Participants were asked "What type of health insurance do you have?" They may choose from the following responses: 1= commercial/private health insurance, 2 = employer health plan/spouse's employer health plan, 3 = Medicaid, 4 = Medicare, and 5 = other.

General Health Status. General health status was assessed by asking participants. "What is your general health status?" Participants may select from the following responses: 1 = very poor, 2 = poor, 3 = neither poor nor good, 4 = good, and 5 = very good.

General Mental Health Status. General mental health status was assessed by asking participants. "What is your general mental health status?" Participants may select from the following responses: 1 = very poor, 2 = poor, 3 = neither poor nor good, 4 = good, and 5 = very good.

Research Design

The correlation research design was selected as the optimal design as the investigator examined relationships between variables using the statistical technique of hierarchical multiple linear regression (HMLR) (Frankfort-Nachmias & Nachmias, 2008). A causal comparative or quasi-experimental design would not have been appropriate for this study, as the investigator's intent is not to determine differences between groups of individuals with regard to a specific outcome (Babbie, 2012). Additionally, patient financial literacy is a personal construct that cannot be manipulated

per requirements of an experimental study (Campbell & Stanley, 1963). A manipulated variable is a variable that is under the control of the researcher, for example, the ability to assign participants to an intervention or control group (Babbie, 2012). While financial literacy has the possibility of being changed as a result of participation in a financial literacy intervention, the construct itself is a personal factor that exists within an individual and is not controlled by the researcher (Babbie, 2012). Had the investigator been interested in examining differences between participants who displayed low or high financial literacy based on their FMBS score, she would have used a causal comparative research design. The focus of this study, however, was not one of differences but one of associations (Babbie, 2012). Therefore, the correlational design was the best design for this research project.

The correlational design has a number of strengths and weaknesses. Key strengths include the ability to study a range of numerically-coded variables and to look at multiple variables at one time (Campbell & Stanley, 1963). Campbell and Stanley (1963) pointed out that correlational studies can be followed by an experimental design if a relationship between variables is established. In this sense, the correctional design is a good first step when investigating a number of variables.

The correlational design also has a number of limitations. First, causation cannot be determined; only relationships or correlations can be established (Campbell & Stanley, 1963). Additionally, two variables can seem to be correlated but, when other variables are accounted for, the apparent correlation disappears (Campbell & Stanley, 1963). Finally, there can be problems with reliability and validity of self-report measures

collected via surveys, which are frequently used with correlational designs (Campbell & Stanley, 1963).

Population and Sampling

As part of the research process, researchers collect data to test hypotheses and support predictions. The intent is to have the results be generalizable to be of scientific value (Frankfort-Nachmias & Nachmias, 2008). All cases that match specifications are considered to be the population; a subset of the population is a sample (Frankfort-Nachmias & Nachmias, 2008). The population for the research study was all patients 18 years of age and over who had had a health care encounter in the last 60 days and had health care insurance. Previous researchers have studied these populations: cross-sectional study of patients at Fairview Health Services, a large health care delivery system in Minnesota (Greene & Hibbard, 2011; Hibbard et al., 2013), and large convenience samples of patients and a national probability sample (Hibbard et al., 2004).

Determining sample size is an important part of sampling strategy. Trochim (2006b) highlighted the four components that influence a researcher's conclusions: sample size, effect size, significance (or alpha), and power (odds of seeing an effect). Power is the likelihood of finding statistically significant differences that really do exist which is related to a Type II error (Sherperis, n.d.). A power of .80 is usually considered to be adequate (Sherperis, n.d.). The primary form of analysis for the research was multiple regression, thus, the appropriate effect size measure is Cohen's $F^2$and .15 is typically used for a medium effect size (Sherperis, n.d.). G*Power was used to calculate sample size for multiple linear regression, the statistical analysis to be used in this study

(Faul, Erdfelder, Buchner, & Lang, 2009). Inputs into G*Power for multiple regression were power = .80, effect size = .15 and number of predictors = 14 (i.e., the independent variable of financial literacy, the two moderating variables of financial responsibility and shared decision-making, the two interaction terms of financial literacy X financial responsibility and financial literacy X shared decision making, and the nine potential covariates). Based in these inputs, the sample size required was $N = 135$.

The sampling method used in the research study was random sampling as conducted by Qualtrics. An Internet panel of research participants was screened for the required characteristics and a random sample selected. The rationale for this strategy was that using random sampling would allow the results to be generalizable. Each member of the population has an equal chance of being selected when using simple random sampling (Frankfort-Nachmias & Nachmias, 2008). This approach was feasible given the use of the Internet panel with access to a wider range of participants geographically. All participants were provided informed consent as part of the recruitment process.

Instrumentation

The first instrument used in the study was a screening instrument that contained two questions as listed below. Each question represented a nominal variable and was coded as 0 = *Yes* and 1 = *No*. The questions to screen participants were (a) Have you had a health care encounter (visit) in the last 60 days? and (b) Do you have health insurance? Participants must have had visited a health care provider in the past 60 days and must have had health insurance. Any participant who provided a "no" response to the two screening questions was unable to take part in the study.

The second instrument contained demographic questions for age, gender, education, marital status, work situation, general health status, mental health status, ethnicity, and type of insurance (see Appendix B for the demographic questionnaire).

Three valid and reliable research instruments were used in this study. An instrument is a scale, test, or index that measures a particular construct or item of interest (Frankfort & Nachmias, 2008). Financial literacy, the independent variable, was measured by the FMBS (Dew & Xiao, 2011). The moderating variable of shared decision making was assessed using the Kriston et al. (2010) SDM-Q-9. The dependent variable, patient engagement, was measured by the PAM (Hibbard et al., 2004). Information on the psychometric quality of these three scales is provided in the following sections.

Financial Management Behavior Scale (FMBS; Dew & Xiao, 2001). The FMBS instrument was developed by Dew and Xiao (2011) at the National Center for Marriage and Family Research study in response to the 2007-2009 recession. The FMBS was validated in a study of 1,014 individuals in a nationally representative sample and found to be valid and reliable (Dew & Xiao, 2011). The construct validity of the FMBs was determined by an exploratory factor analysis, and results showed that all of the items of the FMBS had factor loadings .60 or higher, and the scale factor explained 59% of the variance (Dew & Xiao, 2011). The convergent validity of the FMBS was supported via significant associations between the FMBS and measures of responsible financial behaviors, including financial savings behavior ($b = .63$, $p < .001$), and positive debt behavior ($b = .70$, $p < .001$) (Dew & Xaio, 2011, 2013). Inter-item reliability was

assessed via conducting a Cronbach's alpha measure, with the scale having a very good alpha of .81 (Dew & Xiao, 2011).

Shared Decision Making Questionnaire (SDM-Q-9; Kriston et al., 2010). The SDM-Q-9 was developed by medical researchers in Germany in 2010 (e.g., Kriston et al., 2010) and within a short period of time, has been recognized as psychometrically sound yet short measure of patients' perceived involvement in decision making with their physicians as it relates to understanding, weighting, and selecting different treatment options (Health Foundation, 2012; Scholl et al., 2011; Shared Decision Making Programme, 2012). The SDM-Q-9 has been used as a measured of shared decision making in studies conducted with patients receiving both health care and mental health care (Glass et al., 2012; Scholl et al., 2011) and has been translated into Spanish (De Las Cuevas et al., 2013). The construct validity of the SDM-Q-9 has been determined via exploratory and confirmatory factor analyses that have shown that the measure is best structured as a one-factor (single scale) measure (Kriston et al., 2010; Scholl et al., 2011). The SDM-Q-9 has shown criterion-related validity by being significantly correlated with other measures of decision making, such as the physician-reported OPTIONS scale, and measures of patient satisfaction (Glass et al., 2012; Kriston et al., 2010; Scholl et al., 2011). The SDM-Q-9 has sound inter-item reliability, with Cronbach's alphas ranging from .70 to .94 (Glass et al., 2012; Kriston et al., 2010; Scholl et al., 2011).

Patient Activation Measure (PAM; Hibbard et al., 2004). The PAM is the most utilized measure of patient engagement, with versions of the scale translated into German (Zill et al., 2013), Korean (Ahn, Yi, Ham, & Kim, 2014), Spanish (Alegria et al.,

2009), and Japanese (Fujita et al., 2010). A related instrument has been developed for mental health, PAM-MH (Green et al., 2010). Hibbard et al. (2004) developed the PAM using Guttman scaling via Rasch analysis. Trochim (2006a) noted that Guttman scaling is cumulative and used to establish a one-dimensional continuum for a measurement of a concept. It is also used to predict item responses based on a total score (Trochim, 2006a). Hibbard et al. (2005) researched reducing the number of items included in the 22-item measure to make it more feasible to use activation scores as part of the patient care planning process yet retain adequate precision. In a composite measure such as the PAM, it is important that items included in the measure contribute substantively to the central construct, range from easy to difficult on the measurement scale, be precisely located on the measurement scale, and contribute unique information to the construct (Hibbard et al., 2005). The Hibbard et al. (2005) analysis produced a 13-item PAM that has similar psychometric properties as the original 22-item version. Rasch analysis was used for the development of the 13-item PAM and informed the construct validity of the measure. Successive iterations were conducted to check items that could be eliminated without loss of significant precision or reliability (Hibbard et al., 2005).

A substantial history of psychometric literature attests to its psychometric soundness and rigor (Mukoro, 2012). The PAM shows strong criterion-related validity, with significant associations found between the PAM and self-care and preventative behaviors, health literacy, health information seeking, adherence to medical interventions and treatment, and positive doctor-patient communication (Mukoro, 2012). Evidence of discriminant validity included significant category differences between individuals with

and without chronic health problems, with individuals with chronic medical conditions being more likely to be in Level 1 or 2 as compared to individuals without chronic conditions (Mukoro, 2012). Similar results have been found with regard to individuals with low versus high levels of health literacy, depression, self-efficacy, and hopefulness (Mukoro, 2012). The inter-item reliability of the PAM is sound, with Cronbach's alphas ranging in the mid .80s to low .90s (Hibbard et al., 2004, 2005; Hung et al., 2012; Skolasky et al., 2008, 2011).

Data Collection Procedure

As this research project utilized a survey research design, data were collected via an encrypted and password-protected online survey. Since the early 2000s, use of Internet surveys—often using professional survey firms—have become increasingly commonplace in academia (Archer, 2003; Frankfort-Nachmias & Nachmias, 2008; Monroe & Adams, 2012). This is largely due to their research benefits, such as the potential to reach a wider range of participants, faster and typically higher response rates, and lower costs as compared to more traditional survey techniques (Archer, 2003; Frankfort-Nachmias & Nachmias, 2008; Monroe & Adams, 2012). Research has compared the results of Internet surveys to traditional forms and found comparable results, which suggests the validity and reliability of data obtained online are comparable to those obtained by classical methods (Eysenbach & Wyatt, 2002; Monroe & Adams, 2012). For these reasons, the survey method was the most appropriate method for this research. Survey participants were selected from a Qualtrics consumer panel, and the survey was developed in the Qualtrics system, which also collected the data.

Data Analysis Plan

SPSS 21.0 was the statistical software program used to analyze the data. Data from the 160 participants were downloaded into SPSS 21.0 from the Qualtrics survey website. Inferential and descriptive statistics were conducted as part of the data analysis. For variables that were interval and ratio coded, the mean, standard deviation, and minimum and maximum scores were reported, and for dichotomous or categorical variables, frequencies and percentages were reported.

Each statistical test comes with assumptions. Tabachnick and Fidell (2013) noted that potential sources of bias come from violations of assumptions. The common assumptions are discussed below as well as how each assumption was addressed. Normality assumes each parameter estimate and residual (error) is normally distributed and the sampling distribution is normal (Tabachnick & Fidell, 2013). Tabachnick and Fidell (2013) noted that if sample size is large (e.g. 30+), this assumption is met. Linearity assumes the outcome variable is linearly related to any predictors where the relationship can be summed up to straight line (Tabachnick & Fidell, 2013). Linearity can be assessed via a scatterplot and is met if the data are evenly distributed above and below the horizontal line. Independence assumes that mean errors in the model are not related to each other which is important because the standard error equation is valid only if observations are independent (Tabachnick & Fidell, 2013). If the observed variance is larger than the expected variance, overdispersion occurs (Tabachnick & Fidell, 2013). Multicollinearity exists when there is strong correlation between two or more predictors in a model and is tested by calculating the variance inflation factor (VIF) (Tabachnick &

Fidell, 2013). If VIF values are below 10 for the variables in the model, multicollinearity is not an issue (Tabachnick & Fidell, 2013).

Hierarchical multiple linear regression (HMLR) was used to analyze the research questions. An analysis of the effects of the two moderating variables was conducted via HMLR for moderation, in accordance with recommendations by Kenny and colleagues (Baron & Kenny, 1986; Cook & Kenny, 2005; Judd, Kenny, & McClelland, 2001). Testing for moderation evaluates the strength of the causal relationship via a regression coefficient (Baron & Kenny, 1986; Cook & Kenny, 2005; Judd et al., 2001; Marsh, Hau, Wen, Nagengast, & Morin, 2011). Moderation analysis also helps address external validity by providing more insight as to whether the causal effect is universal (Marsh et al., 2011; Baron & Kenny, 1986; Cook & Kenny, 2005; Judd et al., 2001).

In accordance with HMLR for moderation, the independent variable of financial literacy and the moderating variable of shared decision making must first be standardized (i.e., $M = 0$, $SD = 1$) (Baron & Kenny, 1986; Cook & Kenny, 2005; Judd et al., 2001). The moderating variable of financial responsibility was coded as 0 = low deductible and 1 = high deductible. Interaction variables were then computed by multiplying the independent variable with each of the moderating variables (i.e., financial literacy X financial responsibility, financial literacy X shared decision making) (Baron & Kenny, 1986; Cook & Kenny, 2005; Judd et al., 2001). The interaction term provides information regarding the moderation effects (Baron & Kenny, 1986; Cook & Kenny, 2005).

Those demographic variables found to be significantly correlated with patient engagement were entered as covariates in the first step of the first HMLR (Model 1). The independent variable of financial literacy was entered as the first predictor in the second step followed by patient financial responsibility and the interaction term of financial literacy X patient financial responsibility (Model 2). In the second HMLR, the covariates were again entered as the first step of the first model (Model 1). The second model consisted of the independent variable of financial literacy followed by shared decision making and the interaction term of financial literacy X shared decision making (Model 2). The entering of variables in the HMLR analysis allows for the examination of effects on the dependent variable of patient engagement with regard to the predictors of financial literacy, financial responsibility, shared decision making, the interaction between financial literacy and financial responsibility, and the interaction between financial literacy and shared decision making. The HMLR models were examined for significance: the model *F*-value and corresponding *p*-value (with significance set at $p < .05$) were used to determine significance. The R^2 for each model provided a measure of the effect size (Tabachnik & Fidell, 2013). The standardized beta coefficient (β) and corresponding *p*-value (with significance set at $p < .05$), were used to determine individual significance of the predictors (Tabachnik & Fidell, 2013).

Validity and Reliability

The merits of quantitative study findings are contingent upon the study's internal validity, which pertains to how well a study is conducted, from the initial recruitment of participants and selection of instruments to the use of statistical analyses and

interpretation of statistical results (Ellis & Levy, 2009; Pedhazur & Schmelkin, 2013). The value of results from a quantitative study is also driven by the study's external validity, which concerns the ability to generalize study results to other samples, settings, and time periods (Ellis & Levy, 2009; Pedhazur & Schmelkin, 2013). In this section of the chapter, internal and external validity are discussed, with emphasis placed on their meaning within the context of a correlational research design.

External Validity

External validity concerns the generalizability of the study findings to other categories of people, settings, and times (Ferguson, 2004; Klugh, 2013). Shadish, Cook, and Campbell (2002) elaborated on the original definition of external validity "External validity is … the validity of inferences about whether the identified causal relationship is maintained over variations in persons, settings, time, or treatment variables" (p. 33).

The external validity of a study is inversely associated with internal validity: as one improves, the other diminishes (Ferguson, 2004; Jiménez-Buedo & Miller, 2010). As internal validity "has been and will continue to be the main focus of researchers," most empirical work has subpar external validity (Ferguson, 2004, p. 17). Interestingly, the external validity of correlational research studies tends to be stronger than the external validity of experimental research studies: the high degree of control over study implementation, settings, sample, and measures enhances internal validity, which in turn reduces external validity (Bickman & Rog, 2008; Ferguson, 2004; Jiménez-Buedo & Miller, 2010; Kaya, 2015).

Threats to external validity come from two sources: (a) negative interactions between and among participants, testing conditions, and treatment conditions that obscure results; and (b) study constraints placed on the participants, setting, and times (to enhance study internal validity) (Ferguson, 2004; Jiménez-Buedo & Miller, 2010). Interaction effects influence results from experimental and quasi-experimental studies, as these effects pertain to specific participant groups and conditions. They are not relevant to correlational research studies, because such studies have no testing or treatment groups and groups are not compared (Ferguson, 2004; Jiménez-Buedo & Miller, 2010). However, results from this study cannot be generalized to other participants, settings, and times that are dissimilar from the study participants, settings, and times (Ferguson, 2004; Jiménez-Buedo & Miller, 2010). For example, if the final study sample is comprised females who are predominantly White, study results cannot be generalized to persons of differing social classes and ethnic groups.

Internal Validity

The internal validity of a quantitative study pertains to the rigor and quality of the implementation of the research study (inclusive of sampling issues, instruments used to measure study variables, the rigor of the statistical analysis used in hypothesis testing, and the accuracy of the interpretation of statistical findings), which inform conclusions on "the degree to which observed changes in a dependent variable can be attributed to changes in an independent variable" (Pedhazur & Schmelkin, 2013, p. 154). The strength of the internal validity of a quantitative study is driven by (a) the ability to effectively eliminate confounding variables via random selection and random assignment to

conditions of participants; and (b) the degree of control that the researcher has with regard to the study environment, recruitment protocol, data collection, study instruments, and data analyses (Kaya, 2015). While some researchers argue that "internal validity is only relevant in studies that try to establish a causal relationships" (Kaya, 2015, p. 112), most methodologists concur that the internal validity of non-experimental studies influence study results (Bickman & Rog, 2008; Ellis & Levy, 2009; Kaya, 2015; Klugh, 2013).

Non-experimental studies do, however, differ from experimental studies with regard to the relevance of specific threats to internal validity (Hernon & Schwartz, 2009; Kaya, 2015). Threats to internal validity include history, maturation, testing, instrumentation, selection, statistical regression, and mortality (Bickman & Rog, 2008; Cook & Campbell, 1979). The threats of history, maturation, and attrition are relevant to longitudinal studies where participants are surveyed numerous times, often over long periods of times (Jiménez-Buedo & Miller, 2010; Kaya, 2015).

Testing effects, statistical regression, and instrumentation are threats seen in longitudinal studies and/or studies utilizing pretest-posttest designs (Jiménez-Buedo & Miller, 2010; Kaya, 2015). Testing effects pertain to changes in survey responses "due to the number of times particular responses are measured" (Cook & Campbell, 1979, p. 52). Statistical regression refers to the posttest reduction of a participant's extreme score on a survey answered during the baseline phase of the study (Jiménez-Buedo & Miller, 2010; Kaya, 2015). Instrumentation pertains to changes between the baseline and posttest measures, including differences in measurement tools and researchers (Jiménez-Buedo &

Miller, 2010; Kaya, 2015). These threats are not relevant to correlational research studies that are cross-sectional, that is, involve the collection of data at one point in time (Ellis & Levy, 2009).

There are, however, threats specific to the internal validity of correlation studies: (a) participant selection, (b) location threat, (c) data collector characteristics, (d) reverse causation, and (e) confound variables (Klugh, 2013; Pedhazur & Schmelkin, 2013). The participant selection threat refers to the likelihood that participants who volunteer to participate in studies differ in unique ways from those who do not volunteer (Bickman & Rog, 2008). Consequently, the responses provided by study volunteers on the study survey are not reflective of the population responses (Bickman & Rog, 2008). The threat of participant selection was minimized in this study via simple random sampling (Cook & Campbell, 1979; Hernon & Schwartz, 2009). The rationale for this strategy is that using random sampling will allow the results to be generalizable.

It should be noted, however, that participants in this study had registered as study volunteers on Qualtrics research panels, and study criteria required that participants had health insurance and had had a healthcare encounter in last 60 days. By placing these limitations on study participation, the study sample of participants may not have been reflective of population of American adults (i.e., study participants may differ from the population with regard to age, socioeconomic status, health status, quality of life, and perceptions of health care) (Ferguson, 2004; Kaya, 2015; Pedhazur & Schmelkin, 2013). The use of the Qualtrics research panels, however, may have diminished the location threat: the participants completed the study survey in the same location – online. The

online format of the survey eliminated the data collector characteristics threat (Kaya, 2015).

Other threats to internal validity of correlational studies are reverse causation and confound variables (Ferguson, 2004; Kaya, 2015; Pedhazur & Schmelkin, 2013). Reverse causation refers to the inability to determine temporal precedence and directionality of independent and dependent variables (Ferguson, 2004; Kaya, 2015; Pedhazur & Schmelkin, 2013). It is a possibility in this study that patient engagement influenced financial literacy, which is contrary to the study hypothesis. This is a concern for all correlational studies, and little can be done in cross-sectional correlational studies to control for this threat (Ferguson, 2004; Kaya, 2015; Pedhazur & Schmelkin, 2013).

Like the reverse causation threat, the confound variable threat is a serious yet common threat in correlational studies (Ellis & Levy, 2009; Pedhazur & Schmelkin, 2013). Confound variables are variables not assessed in the study but "account for the variation in both the independent and dependent variables" (Pedhazur & Schmelkin, 2013, p. 163). This threat was minimized via two means. While the study criterion that participants must have had health insurance increased the possibility of a participant selection bias, the establishment of these criteria helped to reduce health insurance (and thus financial) and health status confounds. Moreover, correlational analyses were conducted to determine if participant variables, such as gender, age, ethnicity, highest level of education, health status, mental health status, numeracy, among others, were significantly associated with the moderator and dependent variables (Ellis & Levy, 2009; Pedhazur & Schmelkin, 2013). As significant associations were found, the demographic

variables were entered as covariates in the hierarchical multiple linear regression analyses for moderation that were conducted for hypothesis testing (Devon et al., 2007; Ellis & Levy, 2009; Pedhazur & Schmelkin, 2013)

Statistical Conclusion Validity

García-Pérez (2012) defined statistical conclusion validity pertains to the degree to which study data "can reasonably be regarded as revealing a link … between independent and dependent variables as far as statistical issues are concerned" (p. 1). Statistical conclusion validity is an issue for all quantitative studies, experimental or non-experimental, and the quality of statistical findings is dependent upon the reduction or elimination of threats to statistical conclusion validity (García-Pérez, 2012). These threats include (a) low statistical power; (b) violations of statistical assumptions; and (c) poor reliability of study instruments (García-Pérez, 2012).

Specific actions and analyses were performed to reduce these threats. A power analysis was conducted to determine the appropriate sample size, which eliminated the threat of low statistical power. Statistical procedures and analyses test for violations of assumptions for hierarchical multiple linear regression (HMLR). The assumptions that were tested were (a) normal distribution of interval or ratio item/scale scores, (b) linearity between the independent and dependent variables, (c) lack of multicollinearity between independent and moderating variables, and (d) independence of residual errors (Tabachnick & Fidell, 2013).

Instrument reliability, which is the consistency in the measurement of a construct over different participant groups, settings, and times, is crucial to the rigor, accuracy, and

integrity of a quantitative study (DeVon et al., 2007; Hernon & Schwartz, 2009). Types of instrument reliability include inter-rater, test-retest, and inter-item (DeVon et al., 2007; Hernon & Schwartz, 2009). Inter-rater reliability pertains to the level of agreement on (typically observational) instrument scores between two or more researchers (DeVon et al., 2007; Hernon & Schwartz, 2009). Test-retest reliability is determined by "administering the same test to the same group of respondents at different times," usually weeks or months apart (DeVon et al., 2007, p. 160). Inter-rater and test-retest was beyond the scope of this study and was not performed. Inter-item reliability of an instrument is determined by calculating the Cronbach's alpha of an instrument. A Cronbach's alpha between .70 and .79 is considered good, a Cronbach's alpha between .80 and .89 is considered very good, and a Cronbach's alpha .90 or higher is considered excellent (Tabachnick & Fidell, 2013). The inter-item reliability of the study scales were calculated via Cronbach's alpha (Klugh, 2013).

Ethical Considerations

Researchers must consider the ethical implications of their research particularly during the development of the study. Ethical issues can arise at any time during the research process including when developing the research problem, purpose, research questions, data collection, data analysis, interpretation, writing, and dissemination of the research (Punch, 2014). The purpose of the IRB process is to assess any potential for risk before the research is conducted (Punch, 2014). When doing research, it is important for the researcher to clearly convey the purpose of the research to any participants (Punch, 2014).

A number of risks can arise when collecting data. For example, the researcher must consider any potential harm that may come to participants due to stress, unfair treatment or discomfort and societal risks related to cultural values (Frankfort-Nachmias, 2008). Before collecting data, informed consent must be obtained from each participant (Punch, 2014). Given the topic of this research study, the risks in these areas were minimal. However, assessing financial literacy may be considered a sensitive topic, and may cause some concern. Information is considered sensitive when the information is personal or potentially threatening (Frankfort-Nachmias, 2008). Therefore, I was sure to fully explain the research and its purpose to participants and gain their informed consent for participation prior to conducting the research (Frankfort-Nachmias, 2008).

Another area of ethical consideration is in data analysis and interpretation. In this step, it is important to maintain and protect the anonymity of the participants and their roles (Punch, 2014). In the case of this study, the dataset contained de-identified data, so this area was not a concern. Ethical considerations could have arisen when interpreting the data. I provided an accurate, unbiased account of the information and did not suppress any information that contradicted research questions or hypotheses (Punch, 2014).

Summary

The purpose of this study was to explore the relationship between financial literacy and patient engagement because increasing patient engagement has been shown to improve health outcomes. The research design used for this project was a correlational design, given the research purpose was to assess the relationship between patient financial literacy and patient engagement.

The sampling method used in the research study was a simple random sampling. An Internet panel of research participants was screened for the required characteristics, and a random sample was selected. The rationale for this strategy was that using random sampling allowed the results to be generalizable. Financial literacy, the independent variable, was measured by the Financial Management Behavior Scale (FMBS; Dew & Xiao, 2011. The dependent variable, patient engagement, was measured by the Patient Activation Measure. As this research project utilized a survey research design, data were collected via an encrypted and password-protected online survey. SPSS 22.0 was used to analyze the data. Hierarchical multiple linear regression (HMLR) was used to analyze the research questions.

Chapter 4: Results

Purpose of the Study

Given the significant focus on patient engagement today as well as increasing patient financial responsibilities with regard to health care, this research was designed to explore the relationship between financial literacy and patient engagement. Increasing patient engagement has been shown to improve health outcomes (Harvey et al., 2012; Remmers et al., 2009; Skolasky et al., 2011), which result from facilitating behavior change, providing opportunities to engage in healthy behavior, and developing innovative delivery systems (Hibbard & Greene, 2013). This chapter starts by outlining the research questions, then provides sample demographic information as well as descriptive statistics for the study variables. The sample is compared to the overall U.S. population. The results of the hierarchical multiple linear regressions are presented in answer to each research question. The chapter closes with a summary.

Research Question & Hypotheses

The research questions and hypotheses follow:

Research Question 1

To what degree does patient financial literacy affect patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H1o. There is no statistically significant relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H1a. There is a statistically significant and positive relationship between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 2

To what degree does patient financial responsibility due to high health plan deductibles affect the relationship between financial literacy and patient engagement, controlling for any significant demographic covariates, in a sample of American adults?

H2o. Patient financial responsibility due to high health plan deductibles will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H2a. Patient financial responsibility due to high health plan deductibles will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Research Question 3

To what degree does patient-physician shared decision making affect the relationship between patient financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults?

H3o. Patient-physician shared decision making will not significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

H3a. Patient-physician shared decision making will significantly moderate between financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults.

Data Collection

Upon receiving IRB approval to conduct the study, I established an account with Qualtrics and drafted the survey. A soft launch and pretesting occurred over a 2-week period. Based on results from these pretesting rounds, I made two changes to the screening questions: Question 1, "Have you had a healthcare encounter (visit) in the last 30 days?" was changed to "Have you had a healthcare encounter (visit) in the last 60 days?" for what screeners considered a more reasonable timeframe. Question 3, "Do you have a chronic disease that requires regular (weekly) treatment?" was included in the questionnaire but not used to screen participants.

Survey respondents were first asked to respond to the informed consent question. Only respondents who affirmed their consent were allowed to continue and complete the survey. Although the initial plan was to complete 135 questionnaires, more respondents were recruited, resulting in a total of 160 surveys being completed. All questions required responses, so there were no missing data. Qualtrics included validation checks to ensure respondents were actively engaged in completing the survey and not "straight-lining" responses.

Data Analysis

The section opens with a summary of demographic information and descriptive results for the study variables. Information is provided to show that assumptions were

met for hierarchical multiple linear regression (HMLR) for hypothesis testing. The results of the HMLR are shown for each of the three research questions.

Descriptive Statistics: Study Participants

One hundred sixty American adults participated in the study. Of the 160 participants, 54 (33.8%) were male and 105 (65.6%) were female; one respondent preferred not to specify. Participants ranged between 18 and 67 years of age; the mean age of participants was 43.41 years *(SD* = 15.55). Participants had a range of ethnic backgrounds with 80% *(n* = 128) identifying as White/Caucasian, a range of educational levels with 28.1% *(n* = 45) having some college, and a range of work situations with 35.6% *(n* = 57) being employed full time. Over half of respondents were married *(n* = 86, 53.8%). Descriptive statistics for the demographic variables and for the general health and mental health status variables are shown in Table 1.

Table 1

Descriptive Statistics: Study Participant Demographics (N = 160)

	Frequency	*Percentage*
Gender		
Male	54	33.8%
Female	105	65.6%
Prefer not to specify	1	0.6%
Ethnicity		
American Indian/Alaskan Native	4	2.5%
Asian/Asian American	6	3.8%
Biracial/Multiracial	6	3.8%
Black	4	2.5%
Hispanic/Latino	12	7.5%
Native Hawaiian/Pacific Islander	0	0%
White/Caucasian	128	80%

Education Level		
Less than a high school diploma	2	1.3%
High school diploma/GED	38	23.8%
Some college (1-2 years)	45	28.1%
Associates' degree	19	11.9%
Bachelors' degree	34	21.3%
Master's degree or equivalent	20	12.5%
PhD or equivalent (MD, JD)	1	0.6%
Other	1	0.6%
Work Situation		
Employed full time	57	35.6%
Employed part time	17	10.6%
Self employed	8	5.0%
Not currently working, looking for employment	10	6.3%
Not currently working, not looking for employment	14	8.8%
Receive disability benefits	9	5.6%
Retired	24	15.0%
Student	11	6.9%
Other	10	6.3%
Relationship Status		
Married	86	53.8%
Living with Partner	21	13.1%
Single	37	23.1%
Separated/divorced	11	6.9%
Widowed	5	3.1%
General Health Status		
Very Poor	1	0.6%
Poor	14	8.8%
Neither poor nor good	33	20.6%
Good	75	46.9%
Very Good	37	23.1%
Mental Health Status		
Very Poor	3	1.9%
Poor	11	6.9%
Neither poor nor good	16	10.0%
Good	70	43.8%
Very Good	60	37.5%

Participants responded to questions regarding their general health status and mental health status. The mean rating for general health status was 3.83 on a scale of 1 to

5 where 1 equals very poor and 5 equals very good *(SD* =. 906). The mean rating for mental health status was 4.08 on a scale of 1 to 5 *(SD* =. 958). Further results are shown in Table 2 below.

Table 2

Descriptive Statistics: Health Status

	M	*SD*	*Min*	*Max*	*Sk*
General Health Status	3.83	.91	1	5	-3.04
Mental Health Status	4.08	.96	1	5	-1.59[a]

Note. M = mean; SD = Standard Deviation, Min = Minimum score; Max = Maximum Score; Sk = Skewness. The possible range of scores for the health status scale is 1.00-5.00 points. [a] Variable was re-coded to 3-point Likert scale to address skewness.

Descriptive Statistics: Independent Variable of Financial Literacy (FMBS; Dew & Xiao, 2011)

The independent variable, financial literacy, was measured using the 15-item FMBS scored on a 5-point scale: 1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, 5 = *always* (Dew & Xiao, 2011, p. 58). Subscale items 6 and 7, which were reversed scaled, were recoded to ensure consistent scaling.

Descriptive statistics for the FMBS are presented in Table 3. The FMBS scores can range from 15 to 75; the lowest reported score was 27 in this survey; the highest 75, a difference of 48 points. The mean score was 53.10. The FMBS showed normality in the distribution of subscale scores as evidenced by an overall $z\text{-}_{skewness}$ score of -1.24. If the $z_{skewness}$ value is less than 3.29, the scale shows normality (Kim, 2013; Martin &

Bridgmon, 2012). The FMBS also demonstrated strong inter-item reliability, with a Cronbach's alpha of .80.

Table 3

Descriptive Statistics: FMBS (Dew & Xaio, 2011) (N = 160)

	M	*SD*	*Min*	*Max*	*Sk*	*α*
FMBS	53.10	10.42	27	75	-1.24	.80

Note. *M* = mean; *SD* = Standard Deviation, *Min* = Minimum score; *Max* = Maximum Score; *Sk* = Skewness; α = Cronbach's alpha. The possible range of scores for the 5-item FMBS scale is 1.00-5.00 points.

Descriptive Statistics: Moderating Variable of Patient Financial Responsibility

The moderating variable of patient financial responsibility was measured based on respondents having a high deductible health plan. A high deductible health plan is a health plan, defined here as an annual deductible that is not less than $1,300 (2015) for self-only coverage (IRS, 2014). This nominal variable was coded as follows: 0 = Under $1300 for individual plans/$2600 for family plans and 1 = $1300 and over for individual plans/$2600 and over for family plans and 2 = Don't know. Results are shown in Table 4.

Table 4

Descriptive Statistics: Patient Financial Responsibility

	Frequency	Percentage
Under or equal to $1300 (individual) / $2600 (family plan)	96	60.0%
Over $1300 (individual) / $2600 (family plan)	35	21.9%
Don't know	29	18.1%

Descriptive Statistics: Moderating Variable of Shared Decision Making (SDM-Q-9; Kriston et al., 2010)

The moderating variable of shared decision making was measured using the Kriston et al. (2010) nine-item Shared Decision Making Questionnaire (SDM-Q-9), which gauges the degree of physician involvement with the patient, as reported by the patient. Items on the SDM-Q-9 use a 6-point Likert-type scale, ranging from 0 = *completely disagree* to 5 = *completely agree*, and the total raw scale scores can range from 0 to 45 (Kriston et al., 2010). Descriptive statistics for the SDM-Q-9 are presented in Table 5. The SDM-Q-9 lowest reported score was 0 in this survey; the highest 45. The mean score was 28.03. The SDM-Q-9 demonstrated strong inter-item reliability with a Cronbach's alpha of .93.

Table 5

Descriptive Statistics: SDM-Q-9 (Kriston et al., 2010) (N = 160)

	M	*SD*	*Min*	*Max*	*Sk*	*α*
SDM-Q-9	28.03	11.52	0	45	-3.24	.93

Note. M = mean; SD = Standard Deviation, Min = Minimum score; Max = Maximum Score; Sk = Skewness; α = Cronbach's alpha. The possible range of scores for the 6-item SDM-Q-9 scale is 0.00-5.00 points. SDM-Q-9 initial skewness was -3.99.

Because the SDM-Q-9 scale displayed some skewness, cases were examined for outliers using the SPSS unusual cases function and the creation of scatterplot of scores. The nine outliers were winsorized (i.e., the outlier was replaced with the next highest or

lowest score) (Kadafar, 2001; Lien & Balakrishnan, 2005). The revised SDM-Q-9 scale had sk = -3.24.

Descriptive Statistics: Dependent Variable of Patient Engagement (PAM; Hibbard et al., 2004)

Patient engagement was measured by the PAM, which indicates the degree to which consumers take an active role in managing their health and health care (Hibbard et al., 2004). The PAM has 13 items and typically uses a Guttman- like scale, scored on a theoretical scale of 0-100, which may be categorized into four levels of activation, with Level 4 being the most activated (Hibbard & Greene, 2013; Nijmana et al., 2014). Descriptive statistics for the PAM are presented in Table 6. The lowest report score was 15 in this survey; the highest 59, a difference of 48 points. The mean score was 44.18. The PAM also demonstrated strong inter-item reliability with a Cronbach's alpha of .84.

Table 6

Descriptive Statistics: PAM (Hibbard et al., 2004) (N = 160)

	M	*SD*	*Min*	*Max*	*Sk*	*α*
PAM	44.18	5.83	15	59	-1.79	.84

Note. M = mean; SD = Standard Deviation, Min = Minimum score; Max = Maximum Score; Sk = Skewness; α = Cronbach's alpha. The possible range of scores for the 5-item PAM scale is 1.00-5.00 points. PAM initial skewness was -5.18.

Because the PAM showed skewness initially, cases were examined for outliers using the SPSS unusual cases function and the creation of scatterplot of scores. Two outlier were found: 63 and 71. These outliers were winsorized (i.e., the outlier was replaced with the next highest or lowest score) (Kadafar, 2001; Lien & Balakrishnan, 2005. The revised PAM scale had sk = -1.79.

Comparisons to the Population

Sample statistics on three key demographic variables were compared to population statistics based on the U.S. Census Bureau (2015). At the level of 0.05 significance, there was no difference between the distribution of the sample *(n* = 160) based on education (i.e., those with a bachelor's degree or higher) in comparison to the U.S. population ($x^2 = 3.00$, $p < 0.05$). There was a significant difference between the distribution of the sample *(n* = 159) based on gender in comparison to the U.S. population ($x^2 = 14.77$, $p < 0.05$). There was also a significant difference between the distribution of the sample *(n* = 160) based on ethnicity in comparison to the U.S. population ($x^2 = 22.20$, $p < 0.05$).

Assumptions for Hierarchical Multiple Linear Regression (HMLR)

Multicollinearity. HMLR requires testing for multicollinearity. Multicollinearity exists when there is a strong correlation between two or more predictors in a model. The HMLR assumes that independent and moderating variables do not show multicollinearity (i.e., they are not highly correlated with each other so as to essential measure the same construct (O'Brien, 2007). The best way to assess the multicollinearity is by calculating the variance inflation factors (VIFs) of the independent and moderating variables. A VIF that is less than 10.00 indicates the absence of multicollinearity (O'Brien, 2007). VIFs were calculated for the independent and moderating variables and are reported in Table 7. All VIFs were less than 10.00; thus, the assumption of lack of multicollinearity was met.

Table 7

Variance Inflation Factors (VIFs): Independent and Moderating Variables (N = 160)

	Financial Management Behavior Scale (FMBS)
SDM-Q-9	1.00
Patient Financial Responsibility	1.00

Presence of covariates. When conducting an HMLR, it is important to determine if any meaningful demographic variable is significantly associated with the dependent variable. This variable can then be entered as a control variable, or covariate in analyses, thus accounting for the shared variance between the covariate and the dependent variable (Tabachnik & Fidell, 2013). Spearman's rho correlations, which are utilized to examine correlations between combinations of categorically- and continuously-coded variable (Tabachnik & Fidell, 2013), were conducted between the variables of gender, age, ethnicity, work situation, education level, relationship status, and health status.

The results from the Spearman's analyses are presented in Table 8. Two variables were found to be significantly correlated with the PAM: general health status r(160) = 0.00, $p = 0.01$; and mental health status $r(160) = 0.00$, $p = 0.01$. Given the significance of the general health status and mental health status variables, they were entered on the first step of the HMLR as a covariate.

Table 8

Spearman's Rho Correlations: Demographic Variables and Patient Activation Measure (PAM) Scale (N = 160)

	Patient Activation Measure (PAM)
Gender	.53
Age	.28
Ethnicity	.05
Relationship Status	.46
Education	.99
Work Situation	.51
General Health Status	.00
Mental Health Status	.00

Note. $p < .01$

Other assumptions. The assumption of linearity between the independent and dependent variables was examined via the normal probability-probability (P-P) plot. Linearity is evident when the residuals plot along a vertical line (Klugh, 2013), which is seen in Figure 3 for the first HLMR model and Figure 4 for the second HLMR model. The assumption of linearity was met.

The assumption of homoscedasticity was tested for each HMLR via a scatterplot of residuals. Homoscedasticity is seen when the residuals are equally positioned above and below the horizontal 0 (Klugh, 2013). As seen in Figures 5 and 6, homoscedasticity is evident, and this assumption was met.

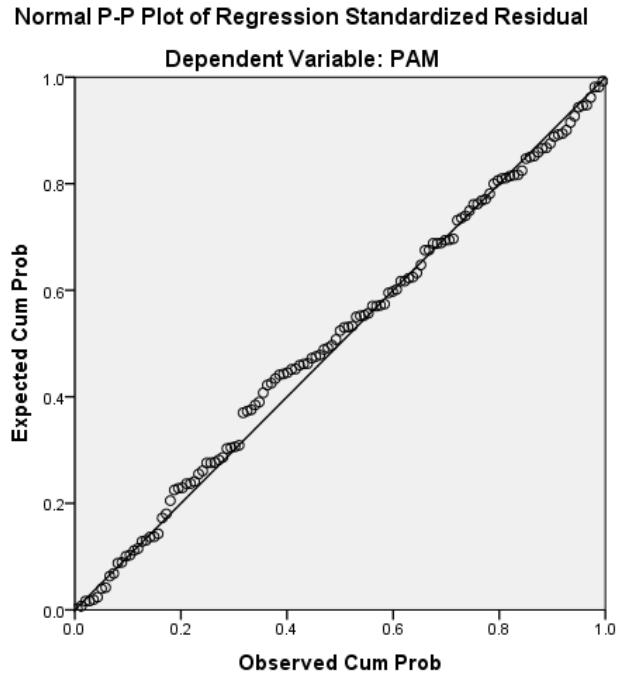

Figure 3. Normal P-P plot for HLMR Model 1.

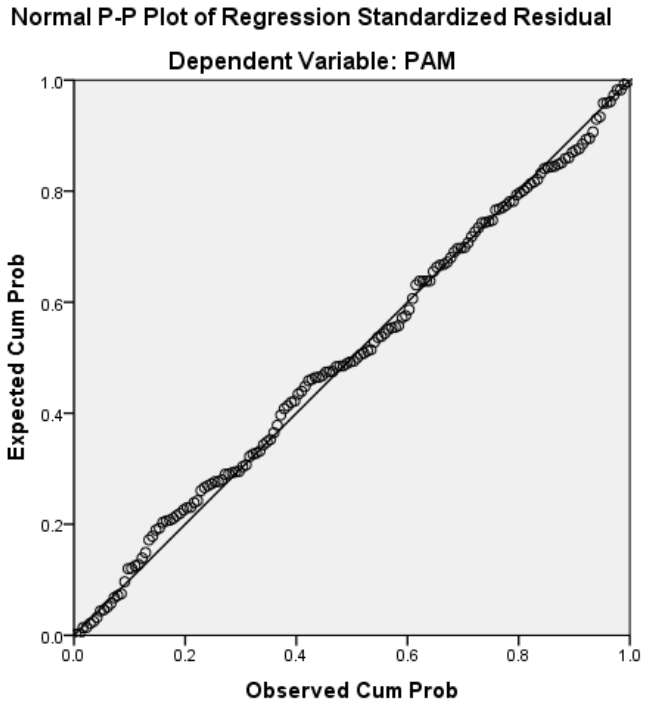

Figure 4. Normal P-P plot for HLMR Model 2.

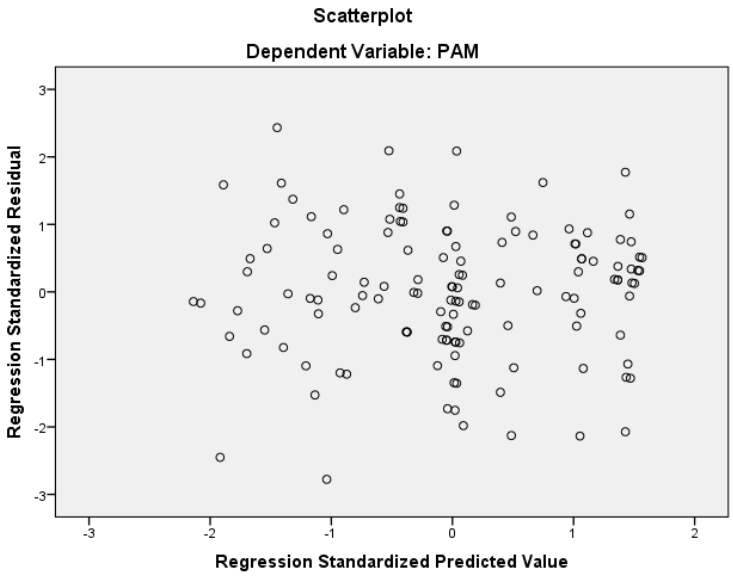

Figure 5. Scatterplot of residuals for HLMR Model 1.

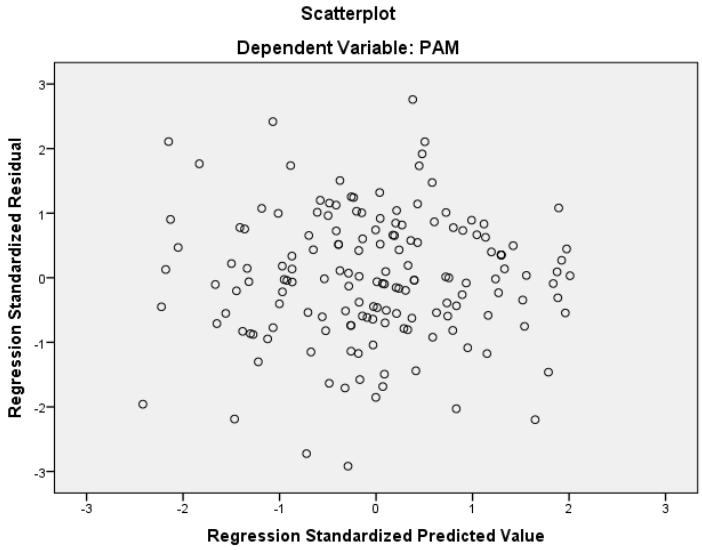

Figure 6. Scatterplot of residuals for HLMR Model 2.

The final assumption is independence of residuals, which is determined by calculating the Durbin-Watson value. A Durbin-Watson value between 1.00 and 3.00 indicates that the assumption is met (Klugh, 2013). As the Durbin-Watson value for

HLMR Model 1 was 2.01 and for HLMR model 2 was 2.00, the assumption of independence of errors was met.

Hierarchical Multiple Linear Regression (HMLR) Analyses for Hypothesis Testing

An HMLR for moderation determines moderation effects by an interaction term (Chatterjee & Hadi, 2013; Hayes, 2013). The interaction term is computed by first standardizing the continuously-coded independent and moderating variables so that these two variables have the same scaling metric (i.e., a mean of 0.00 and a standard deviation of 1.00) (Chatterjee & Hadi, 2013; Hayes, 2013). Categorical predictors do not need to be rescaled, but it is preferred that a dichotomous variable be coded as 0 and 1 (Lien & Balakrishnan, 2005). The two standardized independent and moderating variables are then multiplied to create the interaction term (Chatterjee & Hadi, 2013; Hayes, 2013). Furthermore, HMLR for moderation requires that the independent variable, the moderating variable, and the interaction term variable that indicates moderation be included in analyses even if the interaction term that determines moderation effects is of primary interest (Chatterjee & Hadi, 2013; Draper & Smith, 2014). The HMLR for moderation requires that covariates be entered by themselves in the first model of the HMLR (Chatterjee & Hadi, 2013; Hayes, 2013). By entering covariates into the first HMLR model, the variance in the dependent variable explained by the covariates is removed so that the results of the HMLR provide a more precise estimate of effects of the predictor variables on the outcome variable (Chatterjee & Hadi, 2013; Draper & Smith, 2014; Hayes, 2013). The HMLR for moderation analysis also requires an ordered entry of the independent variable, moderator variable, and interaction term indicating

moderation into the regression model (Chatterjee & Hadi, 2013; Draper & Smith, 2014; Hayes, 2013).

To answer the three research questions, two HMLRs for moderation were conducted. The first HMLR was conducted to address the first and second research questions, that is, to assess the effects of patient financial literacy on patient engagement as well as to determine if patient financial responsibility moderated between patient financial literacy and patient engagement. The second HMLR was conducted to address the third research question, that is, to determine if patient-physician shared decision-making moderated between patient financial literacy and patient engagement. Per HMLR for moderation requirements (Chatterjee & Hadi, 2013; Hayes, 2013), financial literacy, patient-physician shared decision -making, and the interaction term of financial literacy by patient-physician shared decision making were all included as predictors of patient engagement in the second HMLR for moderation, after entry of the covariates in the first model. Based on the results from the Spearman's analysis, perceived mental health status and perceived health status were the only variables significantly associated with patient engagement and thus were entered as covariates in the first model of the HMLR for moderation analyses. The following sections present the results from the two HMLRs for moderation. For clarity, the research questions are restated.

HMLR for moderation: Research Questions 1 and 2. The first study research question was, "To what degree does patient financial literacy affect patient engagement, controlling for any significant demographic covariates, in a sample of American adults who have health insurance?" The second research question was, "To what degree does

patient financial responsibility due to high health plan deductibles affect the relationship between financial literacy and patient engagement, controlling for any significant demographic covariates, in a sample of American adults who have health insurance?" To address these two questions, one HMLR for moderation was conducted. The covariates of perceived mental health status and perceived health status were entered into the first model of the HMLR for moderation. The independent variable of financial literacy, as measured by the FMBS, was entered as the first variable in the second regression model, followed by the moderating variable of patient financial responsibility. The variable of patient financial responsibility was measured by patients' reported insurance deductible, which was coded as 0 = low deductible (under $1,300 for individual/$2,600 for family), 1 = high deductible (under $1,300 for individual/$2,600 for family), and 2 = don't know. Twenty-nine participants reported that they did not know their deductible; data from these 29 participants were not used in analyses, resulting in a still powerful sample size of $N = 131$. The interaction term of financial literacy by financial responsibility, which indicated moderation effects, was entered as the third and last variable into the second model of the HMLR for moderation. The dependent variable was patient engagement, as measured by the PAM. Results from the HMLR for moderation are presented in Table 9.

Table 9

HMLR for Moderation: Mental Health Status, Health Status, Financial Literacy, Patient Financial Responsibility, and Financial Literacy x Patient Financial Responsibility Predicting Patient Engagement (N = 131)

	B	*SE B*	*B*	*B*	*SE B*	*B*
Mental Health Status	1.71	0.68	.23*	1.90	0.69	.26**
General Health Status	0.84	0.52	.15	0.67	.56	.12
Financial Literacy				-0.06	0.14	-.12
Financial Responsibility				-1.74	1.04	-.15+
Financial Literacy by Financial Responsibility				0.78	1.08	.19
R^2/R^2_{change}	.104			.021		
F/F_{change}	7.40			1.02		
p for F/F_{change}	.001			.388		

Note. $p < .10$.*$p < .05$, **$p < .01$; ***$p < .001$

The first HMLR model, with mental health status and health status predicting patient engagement, was significant, $F(2, 128) = 7.40$, $p = .001$, $R^2 = .104$. To determine if one or both predictors influenced model significance, the standardized beta (β) coefficients and corresponding level of significance for each of the two predictors were examined. Perceived mental health status significantly predicted patient engagement, $\beta(131) = .23$, $p = .013$. As participants' levels of perceived mental health increased, so did their level of patient engagement. Perceived general health status was not predictive of patient engagement, $\beta(131) = .15$, $p = .108$.

Results were then examined for the second HMLR model, with financial literacy, financial responsibility, and the interaction of financial literacy by financial responsibility entered as predictors of patient engagement. The model was not significant, $F_{change}(2, 128) = 1.02$, $p = .388$, $R^2_{change} = .021$. As it is possible that individual predictors are

significant when the overall HMLR model is not (Chatterjee & Hadi, 2013), the standardized beta (β) coefficients and corresponding level of significance for the three predictors were examined. Patient financial literacy did not significantly predict patient engagement, $\beta(131) = -.12$, $p = .652$, nor did patient financial responsibility, $\beta(131) = -.15$, $p = .097$ (although it was close to significance, $p = .097$). The interaction term of financial literacy by financial responsibility was not significant, $\beta(131) = .19$, $p = .472$, indicating that financial responsibility did not significantly moderate between financial literacy and patient engagement. Based on the lack of significance, the null hypothesis was not rejected and the alternative hypothesis was rejected for Research Questions 1 and 2.

HMLR for moderation: Research Question 3. The third research question was, "To what degree does patient-physician shared decision making affect the relationship between patient financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults who have health insurance?" To address the third research question one HMLR for moderation was conducted with all 160 participants. The covariates of perceived general health status and perceived mental health status were entered into the first model of the HMLR for moderation. The third research question focused on the moderation effects of patient-physician shared decision-making between financial literacy and patient engagement. Per the requirements of HMLR for moderation, the independent variable of financial literacy was entered into the second regression model of the HMLR for moderation, followed by the patient-physician shared decision-making variable and the financial literacy by shared decision making

variable, which indicated moderation effects. The dependent variable was patient engagement, as measured by the PAM. Results from the HMLR for moderation are presented in Table 10.

Table 10

HMLR for Moderation: Health Status, Mental Health Status, Financial Literacy, Patient-Physician Shared Decision-Making, and Financial Literacy x Patient-Physician Shared Decision-Making Predicting Patient Engagement (N = 160)

	B	*SE B*	*B*	*B*	*SE B*	*B*
Mental Health Status	1.95	0.60	.26***	2.10	0.60	.28***
General Health Status	1.18	0.46	.20*	1.25	0.51	.21**
Financial Literacy				-0.01	0.04	-.03
Patient Physician Shared Decision-Making				0.07	0.04	.15*
Financial Literacy by Patient Physician Shared Decision-Making				0.15	0.38	.03
R^2/R^2_{change}	.148			.025		
F/F_{change}	13.68			1.57		
p for F/F_{change}	<.001			.199		

Note. $p < .10$.*$p < .05$, **$p < .01$; ***$p < .001$

The first model, with mental health status and general health status predicting patient engagement, was significant, $F(2, 157) = 13.68$, $p < .001$, $R^2 = .148$. Specifically, both perceived mental health status and perceived general health status significantly predicted patient engagement, $\beta(160) = .26$, $p = .001$ and $\beta(160) = .20$, $p = .015$, respectively. As indicated by the R^2 of .148, perceived mental health status and perceived general health status collectively explained 14.8% of the variance in patient engagement. As participants' levels of perceived mental health and general health increased, so did their level of patient engagement.

Results were then examined for the second HMLR model, in which financial literacy, patient-physician shared decision-making, and the interaction of financial

literacy by patient-physician shared decision-making were entered as predictors of patient engagement. The HMLR second model was not significant, $F_{change}(2, 157) = 1.57$, $p = .199$, $R^2_{change} = .025$. Results for the individual predictors were then examined. Patient financial literacy did not significantly predict patient engagement, $\beta(160) = -.03$, $p = .737$. However, patient-physician shared decision-making did significantly predict patient engagement, $\beta(160) = .15$, $p = .050$. As the level of patient-physician shared decision-making increased, so did patient engagement. The interaction term of financial literacy by patient-physician shared decision-making was not significant, $\beta(160) = .03$, $p = .692$. Patient-physician shared decision-making did not significantly moderate between financial literacy and patient engagement. Based on the lack of significance found for the interaction term, the null hypothesis was not rejected and the alternative hypothesis was rejected for Research Question 3.

Summary

The purpose of this study was to explore the relationship between financial literacy and patient engagement, as increasing patient engagement has been shown to improve health outcomes. The moderating effects of patient financial responsibility and shared decision making were also evaluated. A survey of 160 adults in the United States was conducted and descriptive and inferential statistics completed for the demographic and study variables. Assumptions for HMLR were addressed, and two HMLRs for moderation were conducted. The first HMLR model with mental and general health status predicting patient engagement was significant. Of the two predictors, perceived mental health status significantly predicted patient engagement. As participants levels of

perceived mental health status increased, so did their level of patient engagement. The second model with financial literacy was not significant. The second HMLR for moderation model was not significant. However, patient-physician shared decision-making did significantly predict patient engagement. As the level of patient-physician shared decision making increased, so did patient engagement. Based on the analysis results, all null hypotheses were not rejected.

Chapter 5: Discussion, Conclusions, and Recommendations

Purpose of the Study

The affordable care act (i.e., health care reform) has resulted in many changes, particularly for those consumers who must now learn what it means to have health insurance and the costs associated with that insurance (Kim et al., 2013; Long & Goin, 2013). The change in insurance status requires that new consumers build their cultural health capital, that is, their efficacy in effectively engaging with the medical community and in being financially responsible with regard to health care costs (Barcellos et al., 2014; Long, 2013).

Given the significant focus on patient engagement today, as well as increasing patient financial responsibilities with regard to health care, understanding the relationship between financial literacy and patient engagement has value, in part because increasing patient engagement has been shown to improve health outcomes (Harvey et al., 2012; Remmers et al., 2009; Skolasky et al., 2011). Moreover, improved health outcomes are the result of facilitating behavior change, providing opportunities to engage in healthy behavior in particular (Hibbard & Greene, 2013).

Key Findings and Interpretation

This study had a number of key findings. This section discusses the key findings and interprets those findings in the context of the literature review and the conceptual framework. This section of the chapter also discusses how the study findings confirm and extend knowledge in the discipline.

Research Question 1: Key Findings

The first study research question was, "To what degree does patient financial literacy affect patient engagement, controlling for any significant demographic covariates, in a sample of American adults who have health insurance?" Results associated with the empirical model presented in Chapter 4 show that there was no significant relationship between patient financial literacy and patient engagement. Thus, the null hypothesis was retained and alternative explanations for the null results must be explored.

There has been limited previous research on financial literacy and patient engagement. While health literacy has been associated with patient engagement (Hibbard et al., 2007), and while research from Bennett et al. (2012) showed that health literacy was significantly correlated with financial literacy, it is the case that the relationship between health literacy and financial literacy is not collinear. In other words, health literacy and financial literacy are similar to one another but are distinctly different literacy constructs. One reason for this may be that definitions of financial literacy vary. Indeed, Huston (2010) noted that a standardized instrument for measuring financial literacy has not yet been developed given the lack of a consistent definition.

This current investigation used the 15-item FMBS to operationalize financial literacy. Dew and Xiao (2011) developed the FMBS to measure the different domains used by consumers to manage their finances. Yet in previous research, financial literacy has often been assessed via measures that estimate financial numeracy alone or in combination with items assessing other financial constructs. In the Bennett et al. (2012)

study, financial literacy was assessed with a series of 23 questions that were mostly adapted from the health and retirement study. The questions in the Bennett et al. (2012) study covered numeracy, financial concepts, and knowledge of financial terms and institutions, but not financial behaviors. James et al. (2012) evaluated financial literacy in relation to health insurance plan decisions. James et al. measured financial literacy using a scale assessing individual knowledge and skills as they pertained to financial numeracy and "the ability to perform simple monetary calculations" (p. 533). Improvements in literacy facilitated making savvy decisions regarding health care insurance and financial literacy could lead to better health outcomes in later years (James et al., 2012).

Other researchers have also used an assessment of skills and numeracy to measure financial literacy. For example, Hibbard, Peters, Dixon, et al. (2007) found that skills such as health numeracy or the ability to process numerical concepts are important predictors of health information use and comprehension. The authors found that numeracy skill and health literacy were the highest predictors of comprehension, while activation mitigated the effects of lower skills in both areas (Hibbard, Peters, Dixon, et al., 2007). Further research by Wood et al. (2011) tied performance on a range of health and financial tasks to numeracy ability, with differences in numeracy ability resulting from various approaches to decision making. Thus, health literacy and numeracy are important factors to consider in regards to health policy decisions affecting health care, and highlight the different approaches to measurement of literacy taken in previous research.

In light of the findings of the current study, it could be argued that financial literacy may be better assessed as part of a hierarchical model that includes basic to more advanced skills in the realm of patient financial literacy. Nutbeam's (2000, 2009) model of health literacy outlined three levels with corresponding goals that could be incorporated into future models of patient financial literacy. These include (a) the functional level focused on basic reading, writing, and literacy skills; (b) the communicative level which includes communication and social skills that can evaluate different forms of communication, applying new information as needed; and (c) the critical level which includes cognitive and social skills required to analyze information and use information to impact one's own life and health (e.g. behavior change). This model suggests that health literacy can progress through different levels, which may be the case for patient financial literacy as well.

It could also be the case that skills and competencies (e.g., patient financial literacy) may be separate or different than financial behaviors as measured by the FMBS. Shim (2010) presented CHC as a set of culture skills and competencies that may lead to better health care relationships. Shim suggested that as patients seek medical information, exercise decision making, and engage in self-surveillance, CHC develops (Shim, 2010). On the basis of his findings Shim proposed that patients still need a range of cultural competencies to maximize the benefit of their health care. As the name implies, CHC is a form of capital as its competencies are utilized via clinical interventions (Shim, 2010). Over time, competencies can generate change or influence behavior; thus, behaviors are different than skills or competencies (i.e., abilities). This

parallels research in health insurance literacy where increased health care insurance literacy significantly predicted proactive and beneficial health care behaviors and attitudes (Barcellos et al., 2014; McCormack et al., 2009).

The analysis also found that mental health status was a significant predictor of patient engagement as measured by the PAM. In the first HMLR, mental health status was found to significantly predict patient engagement. This means that as participants' levels of perceived mental health increased, so did their level of patient engagement. This finding corroborates previous research on this topic that found a relationship or association between health status and patient engagement; for example, Smith et al. (2013) found that lower patient activation was associated with worse physical health, depression, and anxiety. Similarly, Hibbard, Mahoney, Stock, et al. (2007) conducted research to determine whether activation can change and if changes in activations result in changes of behavior within the context of chronic disease. Based on the results of this research, the authors concluded that patient activation can be used to assess individual patient progress over time as well as to monitor and/or segment patient populations, targeting interventions by segment (Hibbard, Mahoney, Stock, et al., 2007). Thus, patient activation can be used to assess patient progress toward improved behavior and ultimately better health.

Research Question 2 Key Findings

The second research question was, "To what degree does patient financial responsibility due to high health plan deductibles affect the relationship between financial literacy and patient engagement, controlling for any significant demographic covariates,

in a sample of American adults who have health insurance?" Results of the current study found that patient financial responsibility did not significantly moderate the relationship between financial literacy and patient engagement. Given this, the null hypothesis was retained and additional alternative explanations for the lack of a statistically significant relationship must be explored.

In this study, 60% of respondents had deductibles of less than $1,300 (i.e., not high deductible plans), and 18% of respondents did not know their deductibles. Ubel et al. (2013) noted that patient financial responsibility is, in its strictest definition, honoring one's out-of-pocket health care costs, which are primarily based on the insurance deductible. Previous research has posited that many of the newly insured have chosen high deductible health plans (HDHP) via the health exchanges for their potential cost savings, especially with regard to affordable premiums (Galbraith et al., 2010). However, the group electing for HDHP was a relatively small segment (22%) of this sample. While some consumers are shifting to taking on a larger percentage of health care costs, in actuality this shift may not yet be occurring on a large scale and may take some time to gain momentum. As noted by Yegian et al. (2013), when out-of-pocket expenses are not increasing, consumers have little motivation to consider and be involved in addressing the specifics of their health care decisions. This alone may be a contributor to the current findings.

It may also be the case that patients may consider finances distinct from health care, and as a result they may be unwilling to consider the financial implications of health care decisions when sick. Previous research by Sommers et al. (2013) supported this

line as thought, as the authors found that consumers were generally unwilling to consider costs when making comparable health care treatment decisions. In fact, research participants were found to be inexperienced in thinking about cost options and tradeoffs, and were generally uninterested in making such decisions primarily because they were unaware of how personal finances could affect their health status (Sommers et al., 2013).

Greater self-efficacy might be a solution to this problem; however, self-efficacy may not yet be achieved as outlined in Bourbeau's self-management model. Bourbeau (2008) proposed a self-management model based on three primary characteristics: disease management, problem-solving and patient self-efficacy, and the partnership between patients and health care professionals to address health care situations. Self-efficacy relates to how much a patient believes he or she can respond to or take action as needed in health care situations (Bourbeau, 2008). While this is a particularly important to situations that require behavior change, such as disease management, patients also need to take action regarding the financial implications of health care decisions and services. Bourbeau found self-efficacy to be a major factor that promotes self-management skills where behavior consequences lead to behavioral outcome expectations. Given the 60% of respondents in the current study did not have high deductible health plans and 18% did not know their deductibles, the survey respondents had unknown or lower levels of patient financial responsibilities (i.e., deductibles) and may not yet have a compelling need to engage in self-management. More specifically, patients may not yet believe or understand that they can respond or take an action as needed in health care situations (i.e., achieve self-efficacy). This is an important consideration that may explain the results of

the current project, as increased engagement has been shown to lead to behavior change. For example, Hibbard, Mahoney, Stock, et al. (2007) demonstrated that activation positively increased across levels and at different trajectories based on a variety of self-management behaviors.

Research Question 3 Key Findings

The third research question was, "To what degree does patient-physician shared decision making affect the relationship between patient financial literacy and patient engagement, controlling for any significant covariates, in a sample of American adults who have health insurance?" The current study found that patient-physician shared decision making did not moderate the relationship between patient financial literacy and patient engagement. However, the variable patient-physician shared decision-making was found to significantly predict patient engagement. As the level of patient-physician shared decision-making increased, so did patient engagement. This finding aligns with previous research on the topic. Mayer (2014) highlighted the importance of shared decision making, given its ability to increase patient activation, and there has been substantial evidence that shared decision making is part and parcel of patient engagement (Coulter, 2012; Hibbard & Greene, 2013; Kupfer & Bond, 2012). Indeed, the documented benefits of shared decision making on patient engagement has led to an increased amount of research focus on decision-making interventions to promote patient engagement, with research showing that such interventions enhance patients' understanding of medical treatment options, as well as the risks involved in medical procedures (Coulter, 2012).

The interaction term financial literacy x patient-physician shared decision making also did not moderate the relationship between patient financial literacy and patient engagement. This finding is not surprising, as previous research has found that patients were generally uninterested in making such health care cost decisions, unaware of how personal finances could affect their health status, and expressed a preference for having their physician make such decisions (Sommers et al., 2013).

Limitations of the Study

Study limitations are circumstances or characteristics of the research that impact the application of the study results or constrain generalizability (Babbie, 2012). As such, it is important to note that this study had a number of limitations. First, the sample was taken from an online panel, and although the sample was diverse in many respects, the sample may be limited or incomplete given that not all patients may have online access. However, the use of an Internet panel does provide wider access to participants geographically. While Internet use has expanded in recent years, previous research has shown that online surveys are biased towards respondents who are of a younger age, of a higher socioeconomic status, are of non-Hispanic ethnicity, and are more literate, and who have more time available (Craig et al., 2013). These factors may have impacted results.

Second, the data collected in this study were self-reported, and as such cannot be independently verified. Data that are self-reported may be biased for a number of reasons: selective memory or the respondent not accurately remembering what actually happened, confusing the timing of when events occurred, tending to remember more

positive situations or circumstances than negative, and exaggeration or embellishing what happened (Brutus et al., 2013). Additionally, because some questions related to financial behaviors and health status, a social desirability effect may have occurred among some of the respondents. Social desirability refers to the tendency of some respondents to answer questions in ways that are socially acceptable (Krumbel, 2011; Phillips & Clancy, 1972). In other words, respondents may respond differently than from their actual behaviors in order to conform to social norms (Krumbel, 2011). The net effect is over-reporting of socially desirable behaviors, which is a source of respondent bias (Krumbel, 2011; Phillips & Clancy, 1972). While responses to the survey were anonymous, the survey questions did require respondents to disclose about financial literacy and health information, both of which are sometimes considered sensitive topics (Neuman, 2011). Thus, respondents had to make a choice and may have chosen to report in a perceived more socially acceptable way.

Third, this study had a smaller sample size compared to other research relating to the PAM (see Appendix A for examples). The original G*Power sample size calculation for this study was based on a potential of 14 predictors. Based on the actual covariate analysis conducted in this study, five predictors were used in each of the HMLR models. While the study sample size (N=160) was significantly larger than required based on this number of predictors, the smaller sample size in relation to other PAM studies may have been a factor in the ability to obtain significance in this study.

Finally, since this study data set is cross-sectional and based on a correlational design, it was not possible to establish causality between the independent and dependent

variables. Campbell and Stanley (1963) pointed out that correlational studies can be followed by an experimental design if a relationship between independent and dependent variables is established. In this sense, the correctional design is a good first step when investigating potentially causal relationships. There also is a risk with correlational designs that other variables or variable relationships that are not accounted for may affect results. Within the context of the correlation design, this study evaluated the moderators of patient financial responsibility and patient-physician shared decision making, both of which were found to be not significant. Thus, the inclusion of other variables or other types of variable relationships into a predictive regression model or an experimental model may be required. Further research may be needed to address these limitations and confirm research results in a wider range of settings and populations.

Recommendations

There are a number of areas for further research based on this study's results. This research utilized random sampling via an online survey panel gathered by Qualtrics. Further research could explore different sampling strategies, for example, by targeting a sample of respondents with high deductible health plans (HDHPs) or lower socio-economic status (SES) who may exhibit different behaviors or have different skills, particularly in relation to financial literacy. Patient activation has also been found to vary with socio-economic status (SES), where lower SES individuals were less activated (Smith et al., 2013). Medicaid patients are typically of a lower socioeconomic status, a fact that can account for a high percentage of care and costs. Thus, there may be a need to understand this patient population in more detail.

This study found that mental health status was a significant predictor of patient engagement; as participants' levels of perceived mental health increased, so did their level of patient engagement. While previous research found lower patient engagement was associated with depression and anxiety (Smith et al., 2013), further research could be conducted to explore the relationship between mental health status and patient engagement across a range of conditions. Additional research could also be conducted to determine if there are any other compounding factors that affect mental health status in relation to patient engagement as well as to determine specific interventions that may improve health outcomes in these scenarios.

Further research could also be conducted to refine financial literacy measurement. Financial literacy has been assessed in many different ways, and as previously noted, no standard measure has yet emerged in the literature. Different models of financial literacy that evaluate potential components of literacy, as well as relationships between aspects of literacy such as skills, knowledge, comprehension, and behaviors, would be helpful to understand this multidimensional construct. To further this goal, future researchers should consider using a qualitative study to probe patient perceptions of financial literacy in relation to health care, as this may be a useful aid to provide further insight into the design of an optimal measure of how patients view financial literacy.

Further research could also be conducted to evaluate different variables and variable relationships with regard to financial literacy and patient engagement. In the current study, patient financial responsibility and patient-physician shared decision making were evaluated as moderators between financial literacy and patient engagement.

It may be beneficial to explore other potential moderating variables, such as socioeconomic status, or variable relationships such as mediation. Mediating variables describe the process by which the intervention is affected, whereas moderating variables are variables for which an intervention varies at different levels of the moderating variable (MacKinnon, 2011). MacKinnon (2011) noted that one of the primary differences between mediating and moderating variables is that the mediating variable specifies the causal relationship, whereas the moderating variable does not. Mediating variables are important in that they help explain why two variables are related (MacKinnon, 2011). Within this context, further research could be conducted to assess whether certain variables, such as socioeconomic status, act as mediating variables.

Social Change Implications

There are many benefits of this research to the profession as well as potential for social change. While this study found no relationship between financial literacy and patient engagement, low financial literacy has been found to affect consumers' ability to manage health care costs. Xiao et al. (2009) found that positive financial management behaviors are associated with physical health, mental health, academic success, and life satisfaction among their survey participants. Carman et al. (2013) noted that emerging evidence suggests that patient engagement can be a pathway toward achieving the goals of better quality of care, greater cost efficiency, and improved population health. However, many individuals are "less than fully proficient consumers" of health care and tend to have "lower than proficient levels of financial literacy" regarding health care costs (Braun et al., 2010, p. 52). Thus, low financial literacy rates affect society in a

number of ways.

Health care legislation, such as the Affordable Care Act (ACA), and financial legislation, such as the Dodd-Frank Act, have spurred changes for patients, consumers, and society overall. The ACA not only has added more consumers to the insurance ranks, but also spurred changes to the health care model in the United States (Betancourt, 2014). The focus for health care providers has shifted from one of service volume to one focused on value or outcomes (Betancourt, 2014), and improving health care outcomes requires more patient engagement (Hibbard & Greene, 2013). Certainly, these efforts have heightened awareness of the need to increase financial literacy for consumers in the context of health care decision making, but also in the realm of patient engagement. Sommers et al. (2013) found consumers to be inexperienced in thinking about cost options and tradeoffs, are generally uninterested in making such decisions, and are often unaware of how personal finances could affect their health status. Thus, more education on financial literacy may be required to increase public awareness and bring about behavior change with significant implications for social change.

Given the mental health status was found to predict patient engagement, health systems should address the mental health status of their patients so activation can be increased. Mental health is considered an important public health issue and the actual prevalence of mental illness is likely higher than documented as many individuals with moderate mental illness are undiagnosed (Nguyen, Chan & Keeler, 2015). Indeed, Mechanic (2003) described mental disorders as "a source of immense personal and societal burden" (p. 10). Regular assessments of mental health status should be

completed and mental health status monitored. Interventions to improve mental health status should also be considered. As patient engagement has been shown to increase health outcomes (e.g. Hibbard et al., 2007, 2013), and research has found a positive relationship between poor mental health and the probability of health expenditures (Nguyen et al., 2015), this area also has significant implications for social change.

Conclusion

To summarize, increasing patient engagement has been shown to improve health outcomes (Harvey et al., 2012; Remmers et al., 2009; Skolasky et al., 2011). Financial literacy has also be linked to improved health outcomes (Braun et al., 2010; Huhmann & McQuitty, 2009), as has shared decision making (see, e.g., Elwyn et al., 2010). Improved health outcomes are the result of facilitating behavior change, providing opportunities to engage in healthy behavior, or developing innovative delivery systems (Hibbard & Greene, 2013). All of these impacts have implications for social change.

This research project provides a better understanding of financial literacy and specific financial behaviors in the context of health care environment today. Given the fact that patient financial responsibilities are expected to continue to grow, there is a need for greater patient engagement and to facilitate more patient-physician shared decision making. Thus, research in these areas is of critical importance to improve not only individual health care outcomes, but also to impact society as a whole.

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Appendix A: Literature Comparison

Author	Sample Size	IV	DV	Controls	Tests	Limitations
Harvey et al (2012)	320	Health status, behaviors	PAM	Control variables included baseline PAM score; intervention group; type of company; age, gender, race; and education	Linear or logistic regression	Low response rate at follow up, data for this study come from only two companies in the northern Midwest, primarily women
Hibbard and Mahoney (2010)	843	PAM	Experience of emotions		Multiple regression analysis	
Hibbard, Greene, Overton (2013)	33,163	PAM	Healthcare costs			Used Fairview billed costs and not all costs; study population consisted of just those Fairview patients with activation stores; study population was older and included a larger share of women than the overall Fairview adult patient population
Hibbard, Mahoney, Stock, Tusler (2007)	489	PAM	Self management behaviors	Control group	Linear regression	
Hibbard, Peters, Dixon, Tusler (2007)	303	Numeracy, literacy, PAM	Quality choices, comprehension		Correlations, linear regression	
James et al (2012)	525	Health literacy, Financial literacy	Decision making about healthcare	Models adjusted for covariates including income, depression, and chronic medical conditions	Bivariate assocations Linear regression	Unexpectedly, the associations between literacy and decision making within the same context (health and finance, respectively) were not stronger than the associations across context (e.g. health literacy with financial decision making). This may partially be explained by the correlation between both domains of literacy and both domains of decision making, indicating partially overlapping constructs
Long and Goin (2014)	7068	Race/ethnicity, income, insurance status	Health insurance literacy		Multiple regression analysis	
Lowenstein et al (2013)	413	Type of insurance plan	Cost reducing behaviors		Logistic regression	Hypothetical situations used, employer impact not assessed
Mottus et al (2014)	730	Literacy	Health outcomes/physical health	Adjusted for covariates	Bivariate assocations Linear regression	Lack of info on health literacy before health measurements
Rademakers et al (2013)	2000	PAM	Active provider choice		Kendall's tau-b - associations Chi square - level analysis Logistic regression	Use of panel with low representation of low literacy, first time use of Dutch PAM and literacy measures
Remmers et al (2009)	1180	PAM	Diabetes-related health outcomes		Binary logistic regression chi square - assocations ANOVA for small datasets	Adults with diabetes, from HMO, potentially more activated patients. Cross-sectional study design - can't establish causality
Robb and Woodard (2011)	1488	financial knowledge	Financial behavior		Multiple regression analysis	inability to explain the causal aspects of the relationship between knowledge and behavior remains one of the largest gaps in the literature
Smith et al (2013)	697	PAM, health literacy	Physical and mental health status measures	Age, gender, race, and comorbidity	Pearson's correlations ANOVA 1 way (TOFHLA, PAM) Linear regression	Cross-sectional study prohibits causal inferences. Sample that had higher levels of both activation and health literacy than normative estimates
Sun et al (2013)	3222	Age, gender, level of education reached, occupation and income	Health literacy, health status, health behavior	Mediators	ANOVA, the Student-Newman-Keuls method	Focus on infectious respiratory diseases population
Wood et al (2011)	121	Choice of drug plan options, numeracy	Medical decision making		Logistic regression, odds ratio	

Appendix B: Demographic Questionnaire

1. What is your gender?
    1. Male
    2. Female
    3. Would prefer not to specify

2. In what year were you born? Provide year: _____

3. What ethnic group do you identify with? You may select more than one response.
    1. American Indian/Alaskan Native
    2. Asian/Asian American
    3. Biracial/Multiracial
    4. Black/African American
    5. Hispanic/Latino(a)
    6. Native Hawaiian/Pacific Islander
    7. White/Caucasian
    8. Other: _____
    9. Would prefer not to specify

4. What is your highest level of education?
    1. Less than a high school diploma
    2. High school diploma/GED
    3. Some college (1-2 years)
    4. Associates' degree
    5. Bachelor's degree
    6. Master's degree or equivalent
    7. PhD or equivalent (MD, JD)
    8. Other: _____

5. What is your current relationship status?
    1. Married
    2. Living with partner
    3. Single
    4. Separated/divorced
    5. Widowed
    6. Other: _____
    7. Would prefer not to specify

6. And which of these best describes your current work situation?
    1. Employed full time
    2. Employed part time

3. Self employed
4. Not currently working, looking for employment
5. Not currently working, not looking for employment
6. Receive disability benefits
7. Retired
8. Student
9. Other: _____
10. Would prefer not to specify

7. What type of health insurance do you have:
    1. Commercial or private
    2. Employer health plan/Spouse's employer health plan
    3. Medicaid
    4. Medicare
    5. Other: _____

8. What is your general health status:
    1. Very poor
    2. Poor
    3. Neither poor nor good
    4. Good
    5. Very good

9. What is your mental health status:
    1. Very poor
    2. Poor
    3. Neither poor nor good
    4. Good
    5. Very good