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Health Insurance Literacy Impacts on Enrollment and Satisfaction with Health Insurance

Angela J. Norbeck
Walden University

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Walden University

College of Health Sciences

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Angela J. Norbeck

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Walden University
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Abstract

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by

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MHA, Capella University, 2014

MBA, Augsburg College, 2008

BS, Metropolitan State University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Health insurance literacy (HIL) contributes to the lack of understanding basic health insurance (HI) terms, subsidies eligibility, health plan selection, and HI usage. The study is one of few to address the existing gap in the literature regarding the exploration of the relationship between HIL, individuals' HI enrollment, and individuals' satisfaction with their HI. The theoretical framework selected for this study was the prospect theory, which describes the behavior of individuals who make decisions. In this cross-sectional correlational study, secondary data set from the third Quarter 2015 Health Reform Monitoring Survey was used. Binary logistic regression models were used to test hypotheses of four predictive relationships between (a) HI enrollment and HIL with HI terms; (b) marketplace enrollment and HIL with HI terms; (c) satisfaction with HI and HIL with HI access to care; and (d) satisfaction with HI and HIL with HI cost of care. Results indicated that participants with high HIL with HI terms had 4.2 times higher odds than those with low HIL to be enrolled in HI and 81% higher odds than those with low HIL to be enrolled in marketplace HI. The most significant relationship indicated that participants with high HIL with HI activities had 12.8 times higher odds than those with low HIL to have high satisfaction with access to care and 8.8 times higher odds than those with low HIL participants to have high satisfaction with cost of care. The finding that low HIL is associated with lower enrollment and lower satisfaction with HI has implications for social change. Policymakers may have the opportunity to utilize this study to promote policies that promote higher HIL, which may lead to increased HI enrollment and improved satisfaction with HI selection.

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Chapter 1: Introduction to the Study

Introduction

Health insurance literacy (HIL) is the measurement of an individual's ability to find, evaluate, and select an optimal health insurance (HI) plan for themselves and family (Quincy, 2012a). Low HIL results in significant confusion and less optimal decisions for HI plans, misunderstanding of self-care or preventative care, higher out-of-pocket costs, overall poor health, and less satisfied patients (Fullerton & McCullough, 2014; Kim, Braun, & Williams, 2013; Levitt, 2015; Politi et al. 2016; Wong et al., 2015). Limited studies exist that examine the relationship between HIL and HI enrollment (Long et al., 2014; Politi et al., 2014). Additionally, limited studies address the relationship between HIL and HI satisfaction specifically understanding consumers' misunderstanding and determinants of coverage decisions (Barnes, Hanoch, & Rice, 2015; Loewenstein et al, 2013). Implications for positive social change may lead to increased HIL levels for U.S. nonelderly adults ages 18 to 64 and thus create enhanced health outcomes and optimal HI decision making, increased health care insurance usage, improved satisfaction with HI selection, and reduced expenses for both the patient and provider.

Chapter 1 will provide the background, problem statement, purpose of the study, research questions and hypotheses, theoretical framework, nature of the study, definitions, assumptions, delimitations, limitations, and significance.

Background

HI in the United States is the primary source of payment to providers and medical care facilities for services, procedures, medications, and devices (Mariner, 2014). HI pays

for often expensive and unpredictable medical care, as well as coverage for preventative services (Mariner, 2014). The implementation of the Affordable Care Act (ACA) further exacerbated issues of HIL with consumers purchasing HI through state run marketplaces, also known as exchanges (Mariner, 2014). Consumers are expected to make decisions within the marketplace with limited experience and many face barriers of low health literacy levels (PwC Health Research Institute, 2012). HIL, an extension of health literacy and previously termed benefits literacy, incorporates an individual's knowledge, ability, and confidence to make an optimal decision on selecting a HI plan (Lawrence, 2015, Moses & Hogg, 2009; Quincy, 2012a).

Improving consumer capabilities through consumer-counseling efforts, increasing consumer confidence utilizing developed curriculum, and reduction in confusion have all been identified through the examination of factors involved in decision making (Brown, et al., 2016; Paez & Mallery, 2014; Politi et al., 2014). Measurement tools and conceptual framework creation supports the identification of the consumer to have higher levels of skill and knowledge to navigate the complexity of the insurance system (McCormack, Bann, Uhrig, Berkman, & Rudd, 2009). Low levels of HIL has been linked to systematic errors in consumers' decision making, an inability to understand sufficient risk management, and ineffective plan selection and utilization (Kim et al., 2013; Levitt, 2015; Lowenstein, et al., 2013). Lack of policy information, information overload, and constrained decision making time has led to suboptimal HI selection, HI dissatisfaction, and undue financial hardship (Kim et al., 2013; Lowenstein et al., 2013).

The exchange or marketplace was intended to deliver accessible and affordable care; however, savvy marketplace navigation, decision making abilities, and choice environment require numeracy and HI comprehension (Barnes, et al., 2015; Bias, Agarwal, & Fitzgerald, 2015). The presentation of information in a simple and clear format, along with communication strategy support from coaches, navigators, and trusted sources could reduce the tendency for individuals to simply default to their previous insurance plans and could improve consumer interest in HI (Bias et al., 2015; Politi et al., 2015; Wong et al., 2015). Achieving higher quality consumer experience and success of the health reform requires exchanges to provide greater transparency and consumer convenience (Barnes et al., 2015; Gitlin, Hunt, Sachen, & Connolly, 2012). Those often identified with the lowest level of satisfaction are uninsured, have poor health outcomes, ignore information impact on decision making (Deshpande & Deshpande, 2014; Politi et al., 2016). There is limited research on the relationship between HIL and the individual's HI enrollment and satisfaction with HI (Lowenstein et al., 2013; Kim et al., 2013; Stern, 2015).

Problem Statement

Nine out of 10 adults in the United States do not have the skills needed to manage their health and prevention, which contributes to a lack of understanding basic HI terms, subsidies eligibility, health plan selection, and how to use HI (Parragh & Okrent, 2015). The coexistence of other disadvantages associated with low health literacy levels include lower education, low income, language barriers, immigration status, and lack of HI (Liechty, 2011). Low-to-moderate levels of health literacy create challenges for

individuals when making HI purchasing decisions creating mismatches for insurance needs and proper utilization (Kim et al., 2013). Consumers' comprehension of purchasing insurance, identifying impacting changes, and locating sources of reliable, current, and trusting information are a necessity (Kim et al., 2013). The lack of understanding in conjunction with the coexistence of associated disadvantages impacts the individual's ability to make the necessary health insurance decisions.

The ACA sought to extend HI coverage to approximately 32 million adults; however, due to levels of low health literacy, many individuals do not benefit from this change (Somers & Mahadevam, 2010). The ACA intended to expand population enrollment, assure care equity, increase provider training, improve public health and wellness, and improve models of quality care (Somers & Mahadevam, 2010). Strategies to address the increasing number of Americans gaining HI include broader Medicaid eligibility, development of marketplaces or exchanges, and subsidies (Long et al., 2014). Not all states have expanded Medicaid, creating a widening of HI coverage disparities and creating a differential access to HI (Adepoju, Preston, & Gonzales, 2015). The ACA's intention to improve HI coverage among the population failed to provide adequate support for those individuals with the lowest levels of HIL leading to lower enrollment.

Purpose of the Study

The purpose of this quantitative study was to address the existing gap in the literature regarding the exploration of the relationship between HIL, individuals' HI enrollment, and individuals' satisfaction with their HI. The study consisted of one

independent variable, HIL, and dependent variables, enrollment in HI, enrollment in a marketplace HI plan, and satisfaction with HI. The control variables selected from sociodemographic factors, such as age, gender, race, education, and income, were controlled during the analysis. The quantitative design allowed testing of relationships between variables from a secondary dataset: Health Reform Monitoring Survey (HRMS).

Research Questions and Hypotheses

This study addressed the following questions:

RQ1: Quantitative: What is the relationship between HIL and enrollment in HI among U.S. nonelderly adults?

- H_01 : There is no statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult
- H_{a1} : There is statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult population.

RQ2: Quantitative: What is the relationship between HIL and enrollment in a marketplace HI plan among U.S. nonelderly adults?

- H_02 : There is no statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult
- H_{a2} : There is statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult population.

RQ3: Quantitative: What is the relationship between HIL and satisfaction with HI among U.S. nonelderly adults?

- H_{03} : There is no statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult
- H_{a3} : There is statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult population.

Theoretical Framework for the Study

The theoretical framework selected for this study was the prospect theory, which was introduced as an alternative to the expected utility theory (Kahneman & Tversky, 1979). The prospect theory describes the behaviors of individuals who make decisions with uncertain outcomes (Verma, Razak, & Detsky, 2014). The use of behavioral economics can provide clarity and productive insights for the drivers of insurance plan decisions and effectiveness of policies to impact the uninsured (Baicker, Congdon, & Mullainathan, 2012). Prospect theory relates to this quantitative study of secondary data from HRMS to explore the relationship between HIL, HI enrollment, and satisfaction with HI through the gain perspective. The enrollment of insurance will not reduce uncertainty based on the prospect theory as further explained in Chapter 2.

Nature of the Study

The nature of this study was a quantitative, cross-sectional correlation design that used a secondary data source, HRMS, for the third Quarter 2015 (July to September). A cross-sectional study consists of conducting a survey with a sample of representative participants at one point in time with no previous data collected before the encounter (Marston, 2010). The quantitative design allowed testing of the relationships between the variables HIL, HI enrollment, and satisfaction with HI.

The key study independent variable was HIL. The key study dependent variables include enrollment in HI, enrollment in marketplace HI, and satisfaction with HI. The confounding variables selected from sociodemographic factors included age, gender, race, education, and income.

The HRMS is a web-based survey conducted semiannually to provide data on HI coverage, access to health care, use of health care, health care affordability, and self-reported health status among adults in the U.S. between the ages of 18 and 64 (Urban Institute, 2016a). The HRMS began in 2013 after the implementation of the ACA (Urban Institute, 2016a). The HRMS relies on GfK's KnowledgePanel® for its stratified random sample of 7,500 nonelderly adults to represent the U.S. population (Urban Institute, 2016b). The KnowledgePanel® is a probability-based internet panel with approximately 55,000 people who live in households with and without internet access (Urban Institute, 2016b). The HRMS sample is drawn from active members of KnowledgePanel® selected through an email invitation to participate with a link to the online questionnaire (Urban Institute, 2016b).

The HRMS utilizes weights that “reflect the probability of sample selection and post-stratification based on benchmarks from the Current Population Survey and the Pew Hispanic Center Survey” (Urban Institute, 2016b). Post stratification variables include “sex, age, race and ethnicity, primary language, education, presence of children in the households, household income, family income as a percentage of FPL, homeownership status, internet access, urban or rural status, state group, and census region” (Urban Institute, 2016b). The data underwent a confidentiality review by ICPSR to limit the risk

of participant disclosure with the alternation of such information (Urban Institute, 2016b). The public-use data files from the 10th round of the HRMS during the third Quarter 2015 was analyzed through IBM SPSS version 21 software.

The use of logistic regression analysis tested the hypotheses by estimating the predictive relationship between the dependent variables and multiple independent variables (Sperandei, 2014). The data analysis focused on four predictive relationships: (a) the odds of enrollment in HI in relation to the level of HIL as measured by confidence in HI terms, (b) the odds of marketplace enrollment in relation to the level of HIL as measured by confidence in HI terms, (c) the odds of satisfaction with access to care in relation to the level of HIL as measured by confidence in HI terms, and (d) the odds of satisfaction with cost of care in relation to the level of HIL as measured by confidence in HI activities. Both the unadjusted and adjusted odds ratio were determined based on controlling or not controlling the confounding variables to determine possible influence on the dependent variable.

The Wald test used a p -value >0.05 to determine statistical significance and confidence interval of 95% used to estimate the precision of the odds ratio. The Wald test is the z -statistic that follows normal distribution and determines is the predictor is significantly different from zero resulting in a significant contribution to the predicted outcome (Field, 2013). Goodness of fit was tested using the Hosmer-Lemeshow model fit test. A p -value greater than 0.05 was considered a good fit and indicates little variability (Hilbe, 2009).

Definitions

The following variables were used in this study:

Enrollment: To become covered for benefits under a group health plan, individual plan, or government plan (45 C.F.R. § 144.103, 2016).

Health Insurance: “A contractual relationship in which the insurer, in exchange for a premium, agrees to provide or to reimburse for the costs of medical care provided to the insured in the event of losses resulting from illness or injury” (Morrisey, 2004, p. 260).

Health Insurance Literacy: “Measures the degree to which individuals have the knowledge, ability, and confidence to find and evaluate information about health plans, select the best plan for their own (or their family’s financial and health circumstances, and use the plan one enrolled” (Quincy, 2012a, p. 7).

Marketplace Health Insurance: An exchange is established by a state that is a “governmental agency or nonprofit entity that makes qualified health plans available to qualified individuals and employers” (Patient Protection and Affordable Care Act §1311(d)(1)-(2)).

Satisfaction: Satisfaction with HI for access to care is defined by participants reporting satisfaction with range of available services available and doctor choices (Holahan & Long, 2017). Satisfaction with HI for cost to care is defined by participants reporting satisfaction with premium paid, share of costs, and high medical bill protection (Holahan & Long, 2017).

Assumptions

The assumptions for this study include the theoretical framework, methodology, and participants. The use of prospect theory was the foundation of this study as it identifies with the individuals' decision making regarding HI enrollment. The selected methodology; quantitative, cross-sectional correlation design; utilizing secondary dataset allowed for the testing of the relationship between HIL, HI and satisfaction. The participants in the study were drawn from the Knowledge Panel that is nationally represented, ages 18–64, and is a stratified random sample. The HRMS is a web-based survey conducted semiannually collecting data from approximately 7,500; with specified oversampling. The participant assumption includes the responses are honest and without bias. Avoiding or minimizing bias during the research design includes the use of random sample and random assignment; which, will allow generalizability to occur and causal conclusions to be drawn from the data collected (Kovera, 2010).

Scope and Delimitations

Addressing the research problem in this study requires the focus to be specific to the participants, as this is also the scope of delimitation using the secondary dataset, HRMS. The participants are delimited to United States adults ages 18 to 64 who were selected using the methods of KnowledgePanel®. Those excluded from this study include children ages newborn to 17 and adults over the age of 64. Information on children is excluded here because such information was provided by the head of household in the HRMS. Excluding adults over the age of 65 is due to their eligibility for Medicare or Medicaid HI. Additionally, the dataset is delimited to the collection of data during

Quarter 3 2015 health reform survey; the 10th round of the survey since it began. The variables delimited to this study are HIL, HI enrollment, and satisfaction with HI. The HRMS dataset consists of various variables unrelated to the studies research questions beyond demographics included (a) self-reported health status, (b) awareness of ACA, (c) sources of information about HI, (d) receipt of state or federal assistance, and (e) access to care. The generalizability of the study was for United States adults ages 18–64 and was not be generalizable for children newborn to 17 and adults over 64 years old.

Limitations

The limitations to the study are those that are outside of the researcher’s control. The use of the secondary dataset, HRMS, limits the methodology to the quantitative design. The quantitative research approach examines the relationship among variables that can be measured with data analyzed through statistical procedures (Creswell, 2014). The survey questions used to collect the data were created by the HRMS developers; however, it is important to note that the questions were based on federal government surveys such as American Community Survey, the Behavioral Risk Factor Surveillance System, the Annual Social and Economic Supplement to the Current Population Survey, and the National Health Interview Survey (Urban Institute, 2016a). The HRMS completion rate is 60% with a cumulative response rate of 5%, which is the survey completion rate, rate of panel recruitment, and rate of panel participation over time (Urban Institute, 2016b). This may be considered low; however, it is representative of the sample population with some risk to nonresponse bias (Urban Institute, 2016b). The nonresponse bias is “mitigated through weighting of the probability of sample selection

and post-stratification of characteristics using benchmarks from the Current Population Survey and the Pew Hispanic Center Survey” (Urban Institute, 2016b). Limitations to my study are based on the use of secondary data, which include the study design, inability to modify original study questions used to collect the data, original study completion rate and cumulative response rate, and lastly the nonresponse bias.

Significance

The significance of this study is its contribution to the body of knowledge centered around HIL and its impact on the nonelderly adult's HI enrollment and HI satisfaction in the United States. This study is important to U.S. adults between the ages of 18 to 64 who have low levels of HIL, lack HI, and have low levels of satisfaction with their HI. Consumers are overwhelmed with too many HI choices and lack an understanding of their HI resulting in systematic errors and suboptimal decisions (Lowenstein et al., 2013). In 2013, HI coverage status was documented at 14.6 million people without private HI in the United States including Medicare, Medicaid, CHIP, state-sponsored, other government-sponsored health, or military plan (Centers for Disease Control and Prevention, 2012). The implications for social change in this study may further address individuals who are assessed with low HIL who do not understand financial and health implications, lack trust in the information they are provided, and have a decreased level of confidence to make HI purchases while having an acceptable level of satisfaction in HI. The research examined in this study may demonstrate that individuals who lack appropriate HIL levels do not enroll in HI and are not satisfied with their HI.

Summary

HIL levels are linked to individuals with lower education, low income, language barriers, and lack of insurance (Liechty, 2011). HI and consumer decision making related to the selection of optimal HI has further challenged ACA implementation (Kim et al., 2013; Mariner, 2014). Low literacy levels create an estimated \$106 to \$238 billion annual

economic impact in the United States (Almander-Douglas, 2013). Limited studies exist that examine the relationship between HIL and HI, where focus is on understanding HI terminology and where respondents gather information when seeking HI (Long et al., 2014; Politi et al., 2014). Previous studies on HIL and satisfaction are limited to understanding consumers' misunderstanding and determinants of coverage decisions (Barnes et al., 2015; Loewenstein, et al., 2013). The examination of the potential relationship between HIL and HI may support the need to provide additional resources for individuals to make optimal HI selection.

The exploration of the relationship between HIL, individuals' HI enrollment, and individuals' satisfaction from HRMS data seeks to address the existing gap within the literature. The use of the theoretical framework, prospect theory, is the basis in determining the individual's insurance selection through the gain prospective. This study contributes to the HIL body of knowledge and address the gap that exists in relation to HI enrollment and satisfaction in HI through the use of a quantitative, cross-sectional correlation design. The study's identified assumptions, scope of delimitations, and limitations bias are addressed through the research design selection. Chapter 2 provides the study's literature search strategy, the theoretical framework, the literature review, and possible future implications based on past literature.

Chapter 2: Literature Review

Introduction

Understanding HI and the factors that are important to an individual's HI decision making has been a heightened cause for additional research since changes to the ACA led to increased eligibility (Politi et al., 2014). Addressing HI misconceptions, strategies to facilitate decision making, and understanding the risk factors associated with the HI complex features and numeric costs has supported a limited number of studies (Politi et al., 2014). HIL is the measurement of an individual's ability to find, evaluate, and select an optimal HI plan for themselves and family (Quincy, 2012a). Less optimal decisions for HI are often made due to low HIL, lack of information or understanding, misinformation, too much information, and time constraints for choice selection (Kim et al., 2013).

I only found limited studies that examined the relationship between HIL and HI (Long et al., 2014; Politi et al., 2014). HIL and HI satisfaction studies have also been limited to understanding consumers' misunderstanding and determinants of coverage decisions (Barnes et al., 2015; Loewenstein, et al, 2013). The consequences of an individual's lack of understanding HI has led to suboptimal decisions; for example, the purchase may cause discontentment due to too many alternative plans, a complicated enrollment process, or difficulty understanding (Loewenstein et al., 2013). The study limited to individuals with private HI who responded to all four questions related to understanding insurance concepts correctly at a reported 14% (Loewenstein et al., 2013). The exploration of how the uninsured are expected to use the HI exchange identified

alignment between stated preferences and difficulty selecting their plan, as well as answering correctly to questions linked to comprehension and numeracy (Barnes et al., 2015). Choice quality and insurance comprehension are a result of information or cognitive overload within the decision environment (Barnes et al., 2015). Critical skills of numeracy and HI plans are required for consumers to navigate through the HI exchanges (Barnes et al., 2015).

The purpose of this study is to address the gap that exists in the literature regarding the relationship between HIL, individuals' HI coverage, and individuals' satisfaction with their HI. The economic impact of low health literacy levels is between \$106 and \$238 billion annually in the United States (Almander-Douglas, 2013). Improving health literacy levels at a health care provider level mitigates negative consequences, improves access to quality care and safety, and increases the value of health care services (Hernandez, 2012). Complexity and difficulty to read HI plans by individuals negatively impacts interpretation and utilization (Politi et al., 2014).

Chapter 2 will provide the study's literature search strategy, the theoretical framework, the literature review of the following variables HI, HIL, enrollment in HI, enrollment in marketplace HI, satisfaction with HI, and HIL and satisfaction with HI, as well as possible future implications based on past literature.

Literature Search Strategy

A search was conducted on past literature accessing library databases such as ProQuest, MEDLINE with Full Text, Communication & Mass Media Complete,

SocINDEX with Full Text, CINAHL Plus with Full Text, Academic Search Complete, and PsycINFO.

The key search terms for all searches were *health insurance, health insurance literacy, medical insurance, marketplaces, satisfaction, health benefits*, and the selected theoretical framework *prospect theory*. The initial scope of the literature review consisted of peer-reviewed articles published between 2012 to 2016 with the accessed library databases. The scope was widened to capture seminal work between 2008 to 2012 due to the lack of available studies conducted between the initial perimeter dates. Additionally, to obtain historical information regarding the selected theoretical foundation, prospect theory, the scope of the literature review consisted of material dated 1979 to 2014.

Theoretical Framework

In 1979, Kahneman and Tversky suggested prospect theory, an alternative of choice under risk from the widely-accepted model of rational choice, expected utility theory (Kahneman & Tversky, 1979). Prospect theory is a sophisticated model used to describe decision making when outcomes are uncertain (Verma et al., 2014). This theory can be explained in a three-step process: (a) people simplify their choices, (b) people use a reference point to frame their decision, and (c) people estimate overall value of their options (Verma et al., 2014). Understanding behavior is the underlining of choice and when faced with uncertainty exploring behavioral sciences can be integrated into medical decision making (Verma et al., 2014). Individual bias and the differences in balancing risks and benefits are attributed to sophisticated decision making when uncertainty is present in the outcomes (Verma et al., 2014). Individuals think in terms of relative than

absolute when prospect theory is applied (Verma et al., 2014). Prospect theory provides a basis for understanding why individuals make decisions where outcomes are uncertain, such as HI.

Prospect theory concludes that choice is based on gains and losses, not on the level of uncertainty (Schneider, 2004). Choice is influenced by an individual's gains and losses based on assumption of risk (Schneider, 2004). This theory suggests individuals choose insurance based on gain perspective, not because it will reduce uncertainty (Schneider, 2004). Determining an individual's decision to choose insurance is only if the loss will occur with certainty and because she is risk averse (Schneider, 2004). An individual's motivation applied to HI decision making is based on the prospect of gain based on risk level (Schneider, 2004). Predicting the consumer's purchase is the prospect of loss based on risk level being certain (Schneider, 2004). The prospect of loss is uncertain when attempting to predict the decline of an individual's insurance (Schneider, 2004).

The use of behavioral economics can provide clarity and productive insights for the drivers of insurance plan coverage decisions and effectiveness of policies to impact the uninsured (Baicker et al., 2012). Individuals often face levels of misperceptions in risk, lack of understanding, and too many choices to make the optimal decision for HI coverage resulting in need to apply behavioral economics to identify the problems and apply effective solutions (Baicker et al., 2012). HI reform requires the understanding of economic behaviors as a component of the choice of coverage and the encouragement of take-up (Baicker et al., 2012). The strategy of the marketplace exchanges and the

processes for efficient enrollment are led by behavioral economics to align with consumer encouragement to take up HI (Baicker et al., 2012). Additionally, policy solution and effectiveness, barriers to enrollment, and optimal coverage patterns can be supported by the understanding of behavioral economics (Baicker et al., 2012). Prospect theory provides information on the relationship between HIL and coverage and satisfaction with HI through the gain perspective and that the selection of insurance is suggested will not reduce uncertainty.

Literature Review Related to Key Variables

Health Insurance

HI is “a contractual relationship in which the insurer, in exchange for a premium, agrees to provide or to reimburse for the costs of medical care provided to the insured in the event of losses resulting from illness or injury” (Morrisey, 2004, p. 260). The ACA was enacted in March 2010 to allow anyone access to quality and affordable health care regardless of income (Rosenbaum & Thorpe, 2016). The law restructured HI coverage into four categories: (a) employer coverage, (b) insurance purchased through an exchange or marketplace, (c) Medicaid, and (d) Medicare (Rosenbaum & Thorpe, 2016). The key provisions of ACA were to increase premium tax credits, develop cost-sharing subsidies, and expand the eligibility of Medicaid for people unable to afford HI previously (Pandey, Cantor, & Lloyd, 2014). Significantly devoted resources for consumer outreach intended to increase availability and access to HI coverage (Call et al., 2015).

ACA’s requirement for health plans to be clear, consistent, and comparable continues to be a topic of concern due to the vitality of millions of Americans who are

projected to receive coverage and to support the right of everyone to have the necessary information to make the most informed decision (Koh et al., 2012). The lack of HI directly impacts an individual's decision to seek care and is a notable financial determinate (Pandey et al., 2014). The unmet health care needs and lack of physician visits were significantly influenced by the ACA's determination to expand coverage and reduce the rate of uninsured in the United States (Pandey et al., 2014). Gaps in coverage, out-of-pocket expenditures, and selecting the least optimal HI plan are the results of individuals' poor decision making done without fully understanding ACA and all its financial implications (Barcellos et al., 2014). HI is a complex financial product for many individuals; which has led to an urgent need for consumers to understand HI and how to make optimal decisions dependent on their own circumstances (Kim et al., 2013). Individuals lacking optimal HI suffer from financial hardships, gaps in coverage, and unmet health care needs.

Health Insurance Literacy

According to Quincy (2012a), HIL:

Measures the degree to which individuals have the knowledge, ability, and confidence to find and evaluate information about health plans, select the best plan for their own (or their family's) financial and health circumstances, and use the plan once enrolled. (p. 7)

HIL is an extension of health literacy that encompasses an individual's ability to navigate the health care system from health plan comprehension, utilization of health care services such as prescriptions or preventative medicines, and as a larger part of the health care

delivery system's external environment the changes rapidly from one organization to the next (Lawrence, 2015). HIL is a primary factor for patient health care delays, overall poor health outcomes, and health care disparities (Katz, 2016).

Previously-termed benefits literacy by financial experts, like HIL, impact employees and their employers when selecting and using benefits effectively (Moses & Hogg, 2009). When employees struggle to understand HI benefits they drain their employers of large monetary investments made to provide information (Moses & Hogg, 2009). The employer-provided information intended to improve their employees' comprehension of HI benefits can often be too complex and exceed endless quantities (Moses & Hogg, 2009). Employers often urge their employees to use their plans wisely, follow care instructions, ask questions of their health care providers, make optimal plan decisions, and seek treatment at the most appropriate venue (Moses & Hogg, 2009). Employers continue to struggle to find the right balance to provide this information and often need to be reminded that the information is best supplied when it is simple and easy to find, when numeracy is taken into consideration, and when visuals are used to avoid communication barriers (Moses & Hogg, 2009). Employer-provided insured individuals are impacted by low levels of HIL resulting in confusion from information overload and suboptimal HI selections.

In 2011, the term HIL was defined during a roundtable event hosted by the Consumer's Union, American Institute for Research, and the University of Maryland Extension (Brown et al., 2016). During this roundtable, the three parties agreed to research and operationalize the new concept of HIL (Brown, et al., 2016). The University

of Maryland Extension team created Smart Choice Health Insurance[©], which is HIL curriculum for the general public (Brown, et al., 2016). Five key theories guided curriculum development: (a) health communications, (b) adult education, (c) social learning theory, (d) stages of change, and (e) planned health behavior (Brown, et al., 2016). The purpose of Smart Choice Health Insurance[©] was to improve consumer capabilities, increase consumer confidence, and reduce confusion when making health insurance plan decisions (Brown, et al., 2016). This study analyzed pretest and posttest data collected between 2013 and 2014 from 994 participants residing in seven states (Brown, et al., 2016). The results indicated that those who attended the Smart Choice Health Insurance[©] workshop had increased confidence, improved capability, and reduced confusion regardless of socioeconomic status, age, race, and gender (Brown, et al., 2016). The challenges brought by the creation of ACA could be resolved through the use of an effective HIL program (Brown, et al., 2016). The creation of Smart Choice Health Insurance[®] was one way to improve consumer HIL, which was supported by the study's results indicating a necessity for effective HIL programs.

HIL, when appropriately assessed, helps identify individuals who require additional assistance to enroll and utilize their HI benefits and determine the topics and skills necessary to improve consumer-counseling efforts (Paez & Mallery, 2014). In June 2013, the American Institutes for Research (AIR) surveyed 828 individuals ages 22 to 64 to examine four areas of HIL; (a) knowledge, (b) information seeking, (c) document literacy, and (d) cognitive skills (Paez & Mallery, 2014). The AIR survey was used in the development of the Health Insurance Literacy Measure (HILM) in a four-stage process

(Paez et al., 2014). HILM's Stage 1 consisted of formulating a conceptual model based on literature, stakeholder input via consultation, panels, and interviews; Stage 2 built the model for each domain identified; Stage 3 conducted two rounds of cognitive testing with revisions; and Stage 4 was the field test with a pilot test followed by a population-based sample for scale development and the establishment of validity (Paez et al., 2014). This survey determined over half of the participants identified as *moderately to very confident* in their ability to select the optimal HI plan, however knowledge results were lower (Paez & Mallery, 2014). Participants were required to calculate out-of-pocket costs for an in-network doctor visit when provided the cost-sharing scenario, only 20% were correct (Paez & Mallery, 2014). The HILM's conceptual model provided rationale for consumer-counseling improvement efforts and further supports the existence of low HIL.

The complexity and specialty of HI marketplaces has continued to increase, requiring consumers to have higher levels of skills and involvement when making optimal decisions on plan purchases, and often resulting in information overload (McCormack et al., 2009). The development of a measurement tool and conceptual framework to specifically capture literacy of older Americans, over the age of 65, identified HI terminology awareness and navigation proficiency within the HI system (McCormack et al., 2009). The conceptual framework for HIL was built on the premise that differences existed based on socioeconomic status and the limited abilities of individuals when managing money (McCormack et al., 2009). Variables consistent with health and insurance were integrated into the conceptual framework with the adoption of a skills-based approach similarly used for measuring numeracy (McCormack et al.,

2009). Two indices, terminology and proficiency exercises, were created for HIL to support the difference found in financial literacy outcomes such as age influence and health outcome factors (McCormack et al., 2009). The conceptual framework resulted in the identification that higher levels of knowledge and a high level of skills are required for consumers to effectively use and navigate the HI system (McCormack et al., 2009). HIL with HI terminology indicates lower levels lead to ineffective use of HI, inadequate money management, and less optimal decisions.

Three tests conducted by Consumers Union supported the existence of information gaps that have significant consequences for consumers and health reform success (Quincy, 2012b). The findings for these three studies may inform future policy, regulatory changes, and communication development because now more than ever, taking an active role in HI decision making requires consumers to have higher levels of product and service knowledge (Quincy, 2012b). These studies identified many critical factors that impact a consumer's decision making such as attitudes towards shopping for coverage, existing doubts in the value of HI, cheaper is not always better, confusion surrounding cost-sharing terms, requirements for high level numeracy, perception of high level financial risk, and confusing medical service descriptions (Quincy, 2012b). Strengthening consumer levels of understanding will require the standardization of health plan options, trusted health plan disclosures, educating the consumer, and offering face-to-face assistance (Quincy, 2012b). HIL improvements may require addressing information gaps, increased communication development, and standardized policies supported the potential for regulatory change.

Optimal decision making requires complicated financial information and sufficient risk management for consumers during open enrollment periods for HI (Kim et al., 2013). Poor choices are often made as a result of low HIL levels, lack of policy information, potential misinformation, too much information or overload, and constrained time for decision making (Kim et al., 2013). A literature review conducted by Kim et al. (2013) identified four areas of concern; (a) financial literacy, (b) health literacy and HIL, (c) consumer decision making and choice, and (d) existing curriculum. Financial literacy is the foundation for consumers to make appropriate decisions regarding insurance and retirement plans; however, high levels of financial literacy are not prevalent in the United States creating low consumer confidence and poor decision making (Kim et al., 2013).

Health literacy impacts an individual's ability to provide self-care or preventative care, the understanding of how to access care or health information and contribute to poor health and increased costs (Kim et al., 2013). Consumer decision making ability requires clarity of plan costs, easy-to-understand information, effective navigation of the HI marketplace, and trustworthy sources of information (Kim et al., 2013). Existing curricula from various nonprofits, foundations, government sources, and the Cooperative Extension Service cover basic HI details; however, they provided minimal evidence of the possibility of enhancing the current level of HIL of their users (Kim et al., 2013). The results of this review indicate consumers lack the knowledge and ability to process the information necessary for making optimal decisions regarding HI (Kim et al., 2013).

Enrollment in Health Insurance

Individuals may obtain HI coverage through employer sponsored plans, individually purchased HI through the exchange, known as the Marketplace, state Medicaid and the separate Children’s Health Insurance Program (CHIP), the federal Medicare program, and the U.S. Department of Veterans Affairs (VA) health care for military veterans (Rosenbaum & Thorpe, 2016; Tsai & Rosenheck, 2014). The uninsured or underinsured individual is among those with poor health outcomes directly impacted by ACA’s complex information regarding HI plan options (Politi et al., 2016). These individuals who lack understanding of HI plans may choose to ignore the information regardless of the impact on their decision making (Politi et al., 2016). HI plan support decision tools require assistance for consumers to estimate their out-of-pocket costs, solicitation of consumer needs, and the ability to guide consumers to an optimal plan to match their needs (Politi et al., 2016). A tool developed and studied, Show Me My Health Plans, provided simplification of information, assessment of user knowledge and feedback, relevance of information, assessment of insurance feature preferences, and creation of a summary page (Politi et al., 2016). The Show Me My Health Plans decision tool identified specific characteristics of those most likely to be challenged by problems accessing and navigating the HI exchange and led to suggestions to improve accessibility for uninsured consumers (Politi et al., 2016).

Enrollment in Marketplace Health Insurance

Marketplace HI is an exchange “established by a state governmental agency or nonprofit entity that makes qualified health plans available to qualified individuals and

employers” (Patient Protection and Affordable Care Act §1311(d)(1)-(2)). Following the implementation of ACA, approximately 6.7 million people purchase HI through the marketplaces operated by the federal government and various states (Levitt, 2015). Low levels of HIL impact consumers’ ability to effectively choose and use HI (Levitt, 2015). Consumers who do not understand differences in out-of-network versus in-network services are impacted with higher out-of-pocket costs including premiums and deductibles (Levitt, 2015). The implementation of ACA included the simplification of plans categorizing the marketplace by standardized tiers for ease of comparison; however, the confusion that exists with the various health care terms continues to frustrate many consumers (Levitt, 2015). The design of the HI marketplace was intended to improve the affordability of HI and its very success is dependent on an individual’s awareness and utilization (Bias et al., 2015).

The opportunity for millions of uninsured individuals changed with the implementation of ACA; mandating health care coverage and requiring the purchase of HI through online marketplaces or exchanges if they did not have employer-based or government sponsored HI (Barnes et al., 2015).

During the first enrollment period of the HI marketplaces a prospective study was conducted in Pennsylvania (Wong et al., 2015). Utilizing a sample population of young adults ages 19 to 39-years, researchers used observation and interviews to capture the participants’ real-time thoughts and reactions (Wong et al., 2015). The study included observations of the participants accessing the insurance exchange and documenting their decision making as they thought out loud (Wong et al., 2015). This observation was

followed by semi structured interviews to capture attitudes toward HI, their level of HIL, and preferences in available plans (Wong et al., 2015). Follow-up interviews were conducted to determine the participants' satisfaction in their plan decision using a decision attitude scale (Wong et al., 2015). The results determined that regardless of levels of education in young adults, the enrollment process was considered to be challenging for HI purchasing (Wong et al., 2015).

Significant confusion was identified as the ability to define risk, understand cost-sharing, and the vagueness of plan coverage (Wong et al., 2015). This confusion and challenge leads individuals to default to previous coverage plans rather than selecting the most optimal plan to fit their needs (Wong et al., 2015). Support to increase enrollments for the HI marketplace will require improved awareness of the marketplace as well as improved interest by consumers, which can be driven by the involvement of community health workers (Bias et al., 2015). HI availability has not historically equated to enrollment due to key barriers and lack of support for consumers; although, encouraged to participate through outreach attempts, enrollment support, and mandates for coverage continue (Call et al., 2015). The one-stop shop intention of the marketplace exchanges was an outreach attempt to streamline consumer eligibility and provide consumer support that a state could opt to implement with support from the federal marketplace (Call et al., 2015). States complying with the expansion of Medicaid experienced the greatest financial implications to establish and facilitate the HI exchange for individuals and small businesses to have HI options (Haeder & Weimer, 2013). The extent of consumer support activities in states included providing navigator assistance in places such as community

centers, churches, small business groups, and the use of town hall forums (Call et al., 2015).

Many of those who encountered the marketplace exchange website reported problems and confusion, which for most now eligible for HI due to the ACA demonstrated a lack of understanding in the details (Politi et al., 2015). The task of choosing HI requires the individual to calculate costs based on various options and the ability to identify the strengths and weaknesses of each plan in relation to future health needs (Politi et al., 2015). An essential element to facilitate optimal decision making for HI is to present simple and clear information to the consumer when navigating the marketplace (Politi et al., 2015). Three strategies developed to support consumers during the HI plan decision making include (a) using a table with plain language, (b) visual conditioning, and (c) using a plain language table and narrative combined (Politi et al., 2015). Supporting individuals who have limited health and numeracy literacy requires a focus on cost and cover through communication strategies supported by information from coaches, navigators, and other trusted sources (Politi et al., 2015).

The affordability of HI in the marketplace is dependent on the participation of young adults ages 19 to 29 (Collins, Rasmussen, Garber, & Doty, 2013). The affordability in price over time for comprehensive health plans is led by healthier than average populations (Collins et al., 2013). Young Americans are often stereotyped as invincible and, assuming they do not need HI will opt to go without, regardless of mandates (Collins et al., 2013). The Commonwealth Fund Health Insurance Tracking Surveys of Young Adults conducted between November 2011 and March 2013 identified

only 27% of individuals ages 19 to 29 were aware of the marketplaces (Collins et al., 2013). Outreach activities will continue to be critical for young adults to increase awareness and access to insurance options (Collins et al., 2013). Insurers are challenged to serve new consumers with a wide demographic base and are responsible for awareness of their products, prices, and assistance options (Gitlin et al., 2012). The exchanges require greater transparency and convenience for consumers to effectively interpret and select the correct health plan based on their specific needs (Gitlin et al., 2012). The newly eligible consumer is less educated and part of a more diverse group that requires access to certain medical treatments and higher acuity patients (Gitlin et al., 2012). Health industry implications for exchanges will likely impact pricing and risk selection for insurers, enlarge the number of patients for providers, increase wage raise pressures for employers, and foster new consumers for pharmaceutical companies (Gitlin et al., 2012). A push of product clarity, increased consumer services, and commercial innovation may lead to a higher quality for the consumer experience (Gitlin et al., 2012).

Innovation and the deployment of Marketplace Assister Programs is a result of rapid changes in ACA implementation, which included outreach, education, post-enrollment support, appeals eligibility assistance, and public benefit application support (Grob, Schlesinger, Grubstein, & Pollitz, 2014). Challenges and innovations included community engagement to address HIL, cultural and linguistic services, call center operations, Medicaid coordination, tax related requirements, immigrant status barriers, and disabled individual support (Grob et al., 2014). The infrastructure for consumer assistance required adequate funding, coordination, training, casework, cross-state

learning, and long-term planning for substantial assistance and further implementation (Grob et al., 2014).

Satisfaction with Health Insurance

Satisfaction is defined as the “fulfillment of a need or want; the quality or state of being satisfied; a course or means of enjoyment” (Merriam-Webster, 2017). The level of consumer satisfaction is an important element for health care reform with careful attention paid by policy makers and researchers (Deshpande & Deshpande, 2014). Those with the lowest health care satisfaction levels often are uninsured, which leads to poor health outcomes (Deshpande & Deshpande, 2014). Valuable information collected in a study utilizing a nationwide representative sample identified three significant factors to an individual’s health care satisfaction; (a) insurance type, (b) medical cost per family, and (c) annual family income (Deshpande & Deshpande, 2014). An increased emphasis on satisfaction is based on a common belief that satisfaction should be measured and improved within health care (Fullerton & McCullough, 2014). Strongly linked to satisfaction are patient health outcomes based on the delivery of health care services, informed patients with high levels of information access, and patient proactivity leading the characteristics to securing a lasting relationship with the consumer (Fullerton & McCullough, 2014).

Health Insurance Literacy and Enrollment in Health Insurance

Comprehension and interpretation become more difficult as HI documents and information become more complex (Politi et al., 2014). Researchers conducted a series of 51 semi structured individual qualitative interviews using purposive sampling of Missouri

residents ages 18 to 25 focusing on the knowledge of HI terminology (Politi et al., 2014). As one of the first studies to examine HI understanding and factors, a linkage was identified between the lack of clear communication regarding exchanges, insurance options, and the disregard for uninsured individuals' needs and their preferences (Politi et al., 2014). Presenting HI information in various forms facilitates understanding of the terminology and plan details (Politi et al., 2014). The overall study suggested that an improvement is needed for the effectiveness of HI communication that would lead to improved insurance option decision making (Politi et al., 2014).

The need for individuals to make informed health care plan selections is evidently more difficult for individuals who are younger in age, characterized as minorities, those with lower income, and individuals with lower levels of education (Paez & Mallery, 2014). The implications of the 2013 AIR Health Insurance Literacy Survey results are a call to increase efforts of individuals' ability to understand HI and the skills required to do so (Paez & Mallery, 2014). Individuals who make marketplace HI plan decisions for the first time stand to lose the most with the risk of foregoing necessary health care due to the inability to understand their HI and determine out-of-pocket costs (Paez & Mallery, 2014). Suggestions for improved HIL may require face-to-face counseling, tools to simulate real-life scenarios, and the stressed importance of utilizing health plan member services for support post-enrollment (Paez & Mallery, 2014).

The use of the HRMS from Quarter 2 2013 addressed issues of ACA outreach and education through supplemental questions; specifically, the respondent self-reported level of confidence in understanding nine insurance concepts, as well as identified where the

respondents gathered their information when they are seeking assistance to choose a HI plan (Long et al., 2014). This study did not address the level of satisfaction, because the supplemental questions related to satisfaction were not implemented into the survey until Quarter 3 2015 (Urban Institute, 2016b). The uninsured adults responded *somewhat* or *very confident* that they understood the nine concepts at only 23.6% (Long, et al., 2014). Individuals who were in the target population for the Marketplace were 29.0% *very confident* or *somewhat confident* in their understanding of the nine concepts (Long, et al., 2014). During the decision making process, the participants collect HI information within their own target population adding to the level of confusion (Long, et al., 2014). Only a third of the members reported that they relied on sources such as materials from consumer groups or government websites (Long, et al., 2014).

The HRMS 2015 Quarter 1, ninth round results specifically addressed how marketplace enrollees navigate the enrollment process, how they use sources when obtaining information about enrolling in health plans, and their awareness of subsidies for premiums and cost-sharing (Blavin, Karpman, & Zuckerman, 2016). Researchers determined 5.3% of marketplace enrollees are nonelderly and are older and have a higher income than the uninsured (Blavin et al., 2016). Moreover, researchers found 60% are white, non-Hispanic and 47.8% are more likely to report *excellent* or *very good* health (Blavin et al., 2016).

A qualitative study conducted using semi structured interviews of uninsured individuals ages 18 to 65 was selected using purposive sampling to identify the need for improved communication strategies and explanations to support insurance decision

making (Politi et al., 2014). The information needs and preferences of the uninsured differed from those who have private insurance or Medicare (Politi et al., 2014). This study specifically addressed knowledge of HI terminology and was limited to the uninsured (Politi et al., 2014).

Health Insurance Literacy and Satisfaction with Health Insurance

A lack of understanding HI has led to consumers making systematic errors in their decision making as they become overwhelmed with overly complex options (Loewenstein et al., 2013). To address the gap that exists within empirical research, two survey designs were used to target the consumers' ability to understand and use HI (Loewenstein et al., 2013). The comprehensive survey addressed consumer understanding and how well they believed they understood HI (Loewenstein et al., 2013). The second survey focused on choice and specifically addressed if consumers had a better understanding of HI would they make optimal decisions (Loewenstein et al., 2013). Many consequences are linked to the lack of understanding HI, including suboptimal decision making, less likelihood of responding to embedded policy incentives, widespread dissatisfaction due to a discontent with existing options, and the possibility of the insurer shrouding information presented to the consumer (Loewenstein et al., 2013). The results of these two surveys highlighted the benefits associated with a simplified design for HI plans (Loewenstein et al., 2013). A simpler design could lead to reduced costs on the insurer, increased consumer understanding of their own HI policies, and improved policy option selection by the consumer (Loewenstein et al., 2013). This study

further demonstrates the possibility to develop a simplified cost-neutral HI product appealing to both consumers and insurers (Loewenstein et al., 2013).

Researchers used a computer-based simulated marketplace to survey and test two samples of individuals. (Barnes et al., 2015). The quality determinants of insurance choices were subdivided into three categories; HI comprehension, amount of choice, and numeracy (Barnes et al., 2015). This study revealed unfavorable performance for how the uninsured populations could perform in the HI exchanges (Barnes et al., 2015). Quality HI coverage choices are impacted by the combination of decision making abilities and quantity of information within a choice environment (Barnes et al., 2015).

Specific factors that impacted these decisions were statistically significant for numeracy and HI comprehension (Barnes et al., 2015). These critical skills further demonstrate the possibility of risk to the consumer and successful implementation of the ACA (Barnes et al., 2015). Participants with more HI coverage options faced cognitive overload resulting in poor quality choice (Barnes et al., 2015). The study raises concerns surrounding consumers' ability to navigate the marketplace and ultimately compare and select an appropriate HI plan (Barnes et al., 2015). The inability to understand, compare, and select the correct HI plan leads to many ramifications; not limited to consumer finance and health, the health care system, the success of the health reform, and achievement of the ACA policy goals (Barnes et al., 2015).

The optimal delivery of HIL information to consumers is critical to increased consumer satisfaction and likelihood to maintain coverage in the future (Stern, 2015). In some instances, HIL gaps led to buyer's remorse, incorrect health service utilization, and

even the complete loss of insurance coverage (Stern, 2015). Maintaining coverage over a period of time needs to be supported by effective tools and resources that are made available at the appropriate time for consumers to make optimal and informed decisions (Stern, 2015). Consumer satisfaction may be a useful tool to provide policy makers and insurers with information related to the enrollment experience with factors such as website quality, disconfirmation, health and financial needs, possible subsidies, and the usefulness of assistance (Fitzgerald & Bias, 2016). Patient satisfaction is a multidimensional concept that is impacted by health services, one's health status, and the expenses associated with medical consumption (Bohm, 2013).

Future Implications

Consumers' literacy and numeracy abilities have affected the health care delivery system, the payer, and consumers themselves when suboptimal decisions are made regarding HI (Greene, Peters, Mertz, & Hibbard, 2008). Those who provide information to the consumer must influence comprehension through deliberately developed frameworks containing essential information and further their efforts through future development and testing of their presentation approaches (Greene et al., 2008). Future studies examining HI understanding could provide insight into addressing HI misconceptions, the examination of analogy-based education for HI choices, and provide necessary background information to assist the individual in HI decision making (Politi et al., 2014). There is a strong recommendation for educators to develop curriculum that is research-based to address HIL for consumers while evaluating the level of consumer optimal decision making because of the ACA implementation (Kim et al., 2013).

An emphasis on the plans out-of-pocket expenses when multiple options are made available can assist with optimal decision making between cost and coverage (Politi et al., 2015). Less complicated HI enrollment for consumers will require creating awareness of options, indicating affordability tradeoffs, enrollment assistance programs through call centers or face-to-face, and implementation of technology driven advanced decision support (Call et al., 2015). Regardless of the impact ACA had on the increased percentage of insured, there remains millions of uninsured individuals resulting from their state not expanding Medicaid, inability to meet immigration rules/requirements, income ineligibility for financial assistance, and the lack of HI knowledge (Majerol, Newkirk, & Garfield, 2015). Empowering patients by providing HI skills through accurate, transparent, accessible information allows for optimal decision making with plan selection (Katz, 2016). A five-point framework may be used for future improvements for HIL including (a) understanding of HIL knowledge gaps, (b) consumer valued information, (c) appropriate timing of the release of information, (d) determination of how consumers want information, and (e) who do the consumers want to provide information (Stern, 2015).

Summary and Conclusions

The major themes of the literature identify the impact HIL has on consumers, health care facilities, health care providers, insurers, policy writers, and regulatory bodies. ACA intended to simplify insurance processes, improve accessibility, expand eligibility, and increase the population's health outcomes; however, ACA has produced unfavorable financial implications for all parties (Barcellos et al., 2014; Hernandez, 2012;

Pandey et al., 2014; Politi et al., 2016). The topic of HIL has brought together many experts in the field to discuss a long-term strategy to make sweeping changes to consumer awareness and increase participation rates (Brown et al., 2016). The development of conceptual frameworks and measurement tools of HIL have identified areas of opportunity in understanding HI terms, health care service usage, and out of pocket costs (McCormack et al., 2009; Stern, 2015). The interpretation of HI documents is very complex often leaving individuals confused, uncertain, and even uninsured (Politi et al., 2014).

Consumers have continued to make suboptimal decisions when considering HI resulting in consequences of dissatisfaction, increased financial obligation, and in some instances, no change to health outcomes (Greene et al., 2008; Loewenstein et al., 2013). The development of health care exchange marketplaces was to provide a one-stop shop for individuals to compare and purchase HI successfully (Call et al., 2015). Outreach activities such as providing navigator assistance, town hall forums, and call centers are all attempts to reach and support those with low levels of HIL (Call et al., 2015; Collins et al., 2013; Grob et al., 2014). Increased consumer satisfaction has been linked to positive health outcomes, informed patients, and demonstrated proactive health behaviors such as preventative health care services (Bohm, 2013; Deshpande & Deshpande, 2014; Fitzgerald & Bias, 2016; Fullerton & McCullough, 2014). There is limited research regarding the relationship between HIL and HI enrollment, and the relationship between HIL and HI satisfaction (Barnes et al., 2015; Loewenstein, et al., 2013; Long et al., 2014; Politi et al., 2016). The research examined in this study may demonstrate that individuals

who lack appropriate HIL levels do not obtain HI and are not satisfied with their insurance. Chapter 3 will provide the research design and rationale, methodology, and threats to validity.

Chapter 3: Research Method

Introduction

The purpose of this quantitative, cross-sectional correlation study is to address the gap that exists in the literature regarding the relationship between HIL, individuals' HI enrollment, and individuals' satisfaction with their HI. Consumers, HI plan providers, and health care providers may use the study results to inform how inadequate HIL levels might lead to suboptimal HI enrollment and dissatisfaction with HI. This study used secondary data collected through the HRMS. Chapter 3 will provide the study's research design and rationale, methodology, threats to validity, and ethical procedures.

Research Design and Rationale

This study is a quantitative, cross-sectional correlation design that used a secondary data source; HRMS. A cross-sectional study consists of conducting a survey with a sample of representative participants at one point in time with no previous data collected before the encounter (Marston, 2010). The cross-sectional design allows data to be collected on more than one variable simultaneously and analyzed for associations (Tucker, 2005). Secondary data is data someone other than the researcher collects for use in a different study or administrative reasons (McGinn, 2008). Utilizing secondary data saves time, money, and labor compared to gathering primary data and allows a researcher the opportunity to explore new research questions or expand on the original analysis (McGinn, 2008). The use of the data was to explore the relationship between HIL, HI enrollment and satisfaction with HI for U.S. nonelderly adults ages 18 to 64.

The independent variable, HIL, and dependent variables, HI enrollment and satisfaction with HI, were obtained from HRMS self-reporting web-based survey using KnowledgePanel ® to draw samples. Participants' survey responses answer Likert scale questions about their level of confidence for HI related terms and health care activities to determine HIL levels (Urban Institute, 2015). Determination of enrollment is self-reported with additional drill-down questions related to whether respondents purchased HI plans through the marketplace (Urban Institute, 2015). By using Likert scale survey questions, the original researchers collected data related to satisfaction with HI addressed services, choice, premiums, shared costs, and protection against costly bills (Urban Institute, 2015).

Methodology

Population

Approximately 7,500 U.S. nonelderly adults ages 18 to 64 participated in the HRMS third Quarter 2015, 10th round (Urban Institute, 2016b). The HRMS first round initiated in 2014 contained a participant sample of 3,000 U.S. adults ages 18 to 64; however, the number of participants was expanded through stratified random samples to 7,500 to improve sample analysis starting with the second round (Urban Institute, 2016b). HRMS oversampling included adults with low-income and those selected in state groups based on potential gains in enrollment as a result of ACA, as well as those based on specific interest by HRMS funders (Urban Institute, 2016b). Adults with low-income are at or below 138% of the federal poverty level (Urban Institute, 2016b). Oversampling ensures there is ample data for specified subgroups within a population, which produces

more reliable estimates (PewResearchCenter, 2017). This increase within the sample size allows for estimates to be made with decreased margin of error (PewResearchCenter, 2017).

Sampling and Sampling Procedures

The HRMS sample of 7,500 participants is a stratified random sampling recruited through KnowledgePanel® maintained by GfK Custom Research (Urban Institute, 2016b). Stratified random sampling divides the population into groups based on similarities and allows for the sample design to be desirable and more precise due to a low variance (Brown, 2007). The nationally representative internet panel is probability-based, which utilizes an online profile survey to collect new panel member demographic information (GfK Custom Research, 2013). Samples are then drawn from the active panel members through the use of a probability proportional to size (PPS) weighted sampling approach (GfK Custom Research, 2013). Probability proportional to size (PPS) “includes a number of sample selection methods in which the probability of selection for sampling unit is directly proportional to a size measure” (Chromy, 2008, p. 620).

KnowledgePanel® has a unique methodology for utilizing samples from within a panel that corrects for in-panel sampling to assure that the panel membership is reliably representative of the U.S. population (GfK Custom Research, 2013).

Sample size was computed with G*Power, a free statistical power analysis tool used to compute statistical power analysis, compute effect size, and provide results graphically (Buchner, Faul, & Erdfelder, n.d.). A power statistical test determines the probability that the null hypothesis will be rejected given that it is actually false (Faul,

Erdfelder, Lang, and Buckner, 2007). The power of the statistical test is the complement that denotes the Type II error probability that the null hypothesis was incorrect and falsely retained (Faul et al., 2007). The *a priori power analysis* provides an efficient method to control the statistical power prior to conducting the study (Faul et al., 2007). Using the conventional criterion, the α probability error is .05 and $1-\beta$ err prob, or the power level, is .95 (Cohen, 1988). The type of power analysis; A priori: Compute required sample size given α , power, and effect size was selected within the z tests family, specifically logistic regression. Logistic regression addresses the relationship between a binary dependent variable and one or more independent variables with a probability distribution either discrete or continuous (Faul et al., 2009). The nondirectionality of the significance criterion resulted in the selection of two-tail parameters input into G*Power for calculating the statistical power analysis (Cohen, 1988). The effect size was measured using the default values for H_0 ; central test statistic distributions; $\Pr(Y=1|X=1) H_0$ was 0.3 and H_a ; noncentral test statistic distributions; $\Pr(Y=1|X=1) H_a$ was 0.5, which calculated the odds ratio 2.33 (Faul et al., 2009). The odds ratio compares the odds of the outcome of interest occurrence given the exposure to the variable of interest (Szumilas, 2010). The additional model predictors in default values; R^2 other X is 0 since there are no covariates, X parm μ is 0, and X parm σ is 1 (Faul et al., 2009). The output parameters provided the statistical decision criterion or critical Z of 1.96, total sample size 104, and actual power 0.95 (Faul et al., 2009).

Approximately 50,000 U.S. households participate in the KnowledgePanel® both with and without internet access. (Urban Institute, 2016b). Recruitment of the

KnowledgePanel® panel members is conducted through an address-based sample frame from the United States Postal Service Delivery Sequence File (Urban Institute, 2016b). The computerized delivery sequence file provides updated delivery sequence information to qualified mailers that includes complete and accurate addresses (United States Postal Service, n.d.). The use of address-based sampling versus the previously used method of random-digit dialing provides a statistically valid sampling covering approximately 97% of U.S. households (GfK Custom Research, 2013). This sampling includes households with unlisted telephone numbers or no landline telephones, households with cell phones only, and households that do not have current internet access or devices that access the internet (GfK Custom Research, 2013).

The KnowledgePanel® members selected to participate in the HRMS are emailed an invitation with links to the online questionnaire (Urban Institute, 2016b). If necessary, follow-up emails and automated telephone reminders are used for members who do not respond to the initial email invitation (Urban Institute, 2016b). The web-based survey consists of two sections (a) core information on nonelderly adults takes approximately six minutes to complete and (b) topical questions takes approximately four minutes (Urban Institute, 2016b). If a household respondent is randomly selected to address questions regarding their minor children, then there is another 6 minutes added to complete (Urban Institute, 2016b).

The HRMS is conducted semiannually starting in Quarter 1, 2015 and is a shift from quarterly fielding (Urban Institute, 2016b). Publicly available data is made available with the support on the Robert Wood Johnson Foundation (RWJF) and the partnership of

the ICPSR 9 months after each survey round (Urban Institute, 2016b). To protect the confidentiality of the survey respondents' data are de-identified with some variables excluded or modified (Urban Institute, 2016b). The access to public-use data files is available to the general population and does not require an affiliation with an ICPSR member institution (ICPSR, 2016a). Application is required to access restricted data which requires the submission of the project description, IRB approval, approved security plan, roster of research and IT staff, and confidentiality pledges (ICPSR, 2016a). This study was conducted using publicly available data and an application for restricted data is not necessary.

Instrumentation and Operationalization of Constructs

The HRMS began in 2013 as a survey designed to provide timely information after the implementation of the ACA (Urban Institute, 2016a). Utilizing GfK's KnowledgePanel®, HRMS provides self-reported data on HI coverage, access to health care, use of health care, health care affordability, and self-reported health status among adults in the U.S. between the ages of 18 and 64 (Urban Institute, 2016a). RWJF and Urban Institute provide the HRMS core funding with other donors who support targeted oversampling and special data analysis (Urban Institute, 2016a).

Various studies have been conducted using the results of the HRMS survey from data collected January 2013 through March 2015 (Blavin et al., 2016; Long et al., 2014; Shartzter, Long, & Anderson, 2016). Utilizing the results from the HRMS 2015 Quarter 1, ninth round, an assessment of how marketplace enrollees navigated the enrollment process, exploration of sources used when obtaining information about enrolling in health

plans, and awareness of subsidies for premiums and cost-sharing was conducted (Blavin et al., 2016). The study suggests there are still individuals unaware of the marketplace coverage and subsidies confusion still exists (Blavin et al., 2016).

A comparative study utilizing HRMS data collected from September 2013 to March 2015 assessed affordability of care and access to care (Shartz et al., 2016). The examination of the changes for nonelderly adults used multivariate regression models for the nine rounds of the HRMS (Shartz et al., 2016). The study results indicated an improvement to access to care and reductions in challenges associated with affordability over the timeframe indicated (Shartz et al., 2016). This study suggests continued monitoring will determine if ACA is meeting its key goals and necessary future refinements (Shartz et al., 2016).

Assessing the reliability of the HRMS dataset used samples collected in comparison to various federal survey data, which demonstrated consistency and increased confidence (Long et al., 2014). A sample collected during Quarter 2 2013 and compared to adults who responded to the 2011 American Community Survey (ACS) showed similar population characteristics (Long et al., 2014). A comparison of HRMS to the National Health Interview Survey (NHIS) demonstrated overlap in measures of health care access and affordability supporting the issue of barriers to care for the uninsured (Long et al., 2014). Based on the comparisons, the HRMS was determined to be a credible source when monitoring effects of the ACA and its ability for adding supplemental questions could provide more timely information ahead of federal survey data (Long et al., 2014).

Operationalization

The variables for this study were obtained through the survey questions from the 10th round third Quarter 2015 HRMS. The independent variable HIL was derived from responses to the following self-reported survey question:

Some people find HI coverage complicated and difficult to understand. For each of the HI terms below, please indicate whether you are very confident, somewhat confident, not too confident, or not at all confident in how well you understand what the term means for HI coverage. (Urban Institute, 2015, p. 13)

The seven HI terms were (a) premium, (b) deductible, (c) copayments, (d) coinsurance, (e) maximum annual out-of-pocket spending, (f) provider network, and (g) covered services (Urban Institute, 2015). The level of measurement for the seven HIL terms was continuous as responses used a Likert scale. A count measure was used based on the total number of responses *very confident* and *somewhat confident* for each of the seven terms, which created a nominal variable for the extent of HIL with low (0-2), medium (3-5), or high confidence (6-7) with HI terms, as shown in Table 1. The count measures are for the purpose of creating a nominal categorical variable from a continuous variable to effectively conduct binary logistical regression models.

Table 1

Variable Coding

Variable	Type of Variable	Coding
Independent Variable		
Health insurance literacy with health insurance terms	Nominal	Low= very confident, somewhat confident with 0-2 terms Medium= very confident, somewhat confident with 3-5 terms High= very confident, somewhat confident with 6-7 terms
Health insurance literacy with health insurance activities	Nominal	Low= very confident, somewhat confident with 0-2 activities Medium= very confident, somewhat confident with 3-5 activities High= very confident, somewhat confident with 6-8 activities
Dependent Variable		
Enrollment in health insurance	Binary	1=covered 2=not covered
Enrollment in marketplace coverage	Binary	1=Yes, I am enrolled in a health insurance plan through the marketplace 2=No, I am not enrolled in a health insurance plan through the marketplace.
Satisfaction with access to care	Binary	1=very satisfied, somewhat satisfied with range of services available and choice of doctors. 0=somewhat dissatisfied, very dissatisfied with range of services available and choice of doctors.

(table continues)

Variable	Type of Variable	Coding
Satisfaction with cost of care	Binary	1= very satisfied, somewhat satisfied with premium, share of costs, and medical bill protection. 0= somewhat dissatisfied, very dissatisfied with premium, share of costs, and medical bill protection.
Sociodemographic factors (control variables)		
Age	Categorical	18-34 35-54 55-64
Gender	Categorical	Male Female
Race	Categorical	White, non-Hispanic Black, non-Hispanic Other, non-Hispanic Hispanic 2+ races, non-Hispanic
Education	Nominal	Low= no formal education through 12 th grade no diploma Medium= high school graduate – high school diploma or the equivalent (GED) and some college, no degree High= associate degree through professional or doctorate degree
Income	Categorical	Low= Less than \$5,000 to \$29,999 Medium= \$30,000 to \$99,999 High= \$100,000 or more

The eight HIL activities based on the respondent's confidence level was created from the following survey question:

Some people also find HI coverage complicated and difficult to use. For each of the activities below please indicate whether you are very confident, somewhat confident, not too confident, or not at all confident that you know how to do the activity. (Urban Institute, 2015, p. 14)

According to Urban Institute (2015), the following eight HI activities were recommended:

- Find a doctor or other health provider who is in your health plan's network.
- Figure out whether a service is covered by your plan.
- Figure out which prescription drugs are covered by your plan.
- Figure out how much a health care visit or service will cost you.
- Figure out which health care costs will count toward your health plan's deductible.
- Figure out how much it will cost to visit a health care provider or use a service that is not in your health plan's network.
- Figure out what counts as preventative care services under your plan.
- Review the Explanation of Benefit (EOB) statements you get from your plan to understand what the plan paid for a service and what you owe.

The level of measurement for the eight HIL activities was continuous as responses used a Likert scale. A count measure was used based on the total number of responses *very confident* and *somewhat confident* for each of the eight activities, which created a

nominal variable for the extent of HIL with low (0-2), medium (3-5), or high confidence (6-8) with HI activities, as shown in Table 1. The count measures are for the purpose of creating a nominal categorical variable from a continuous variable to effectively conduct binary logistical regression models.

The dependent variables (enrollment in HI, enrollment in a marketplace HI plan, and satisfaction with HI) were derived from responses to the self-reported survey questions. Enrollment in HI was a dependent variable using responses from the following question: “The next question asks about your HI or health coverage plans. In answering this question, please exclude plans that pay for only one type of service (such as nursing home care, accidents, family planning, or dental care) and plans that only provide extra cash when hospitalized. Are you currently covered by any of the following types of HI or health coverage plans?” (Urban Institute, 2015, p. 4). The level of measurement was binary and responses were categorized 1=covered and 2=not covered (Urban Institute, 2015).

Enrollment in a marketplace HI plan was a dependent variable using responses for the question “Is your current coverage a HI plan through the marketplace? You may have completed the enrollment process yourself or had someone else do it for you.” (Urban Institute, 2015, p. 5). The level of measurement was binary and responses were categorized 1=Yes, I am enrolled in a HI plan through the marketplace, 2=No, I am not enrolled in a HI plan through the marketplace.

Satisfaction with HI was a dependent variable using responses to the following question: “The next question asks you to rate your satisfaction with your current health

insurance coverage on several different factors. Would you say you are very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied with your current health insurance coverage in terms of” (Urban Institute, 2015, p. 7):

- (1) The range of health care services available?
- (2) Your choice of doctors and other providers?
- (3) The premium that you pay for the coverage?
- (4) The share of the costs that you pay when you use doctors or other providers who are not in your health plan’s provider network?
- (5) The protection that your coverage provides against high medical bills?

The level of measurement for the five satisfaction items is based on a five-point Likert scale. The five satisfaction items were classified into one of two groups (a) access to care or (b) cost of care. The access to care group consists of the two statements regarding the range of services available and choice of doctors. The cost of care group consists of the three statements regarding premiums, share of costs, and medical bill protection. *Very satisfied* and *somewhat satisfied* responses for each of the five statements was dummy coded as 1. *Somewhat dissatisfied* and *very dissatisfied* response for each of the five statements was dummy coded as 0. The grouping of the categorical variables assisted with model efficiency when conducting the binary logistic regressions.

Confounding variables may or may not affect the outcome variable (Pourhoseingholi, Baghestani, & Vahedi, 2012). Controlling the confounding variable of demographics and socioeconomics; will result in the logistic regression model production

of an adjusted odds ratio (Pourhoseingholi et al., 2012). Sociodemographic factors are added to the logistic regression model to analyze how the variables effect the power of the model, if there is a positive influence on the model, and impact when the variables are present or excluded (Menard, 2002). The specific control variables in this study included sociodemographic factors (age, gender, race, education, and income), shown in Table 1. Age was collapsed to create a categorical variable 18-34, 35-54, and 55-64 years of age. Gender is a categorical variable male or female. Race was collapsed to create a categorical variable white, non-Hispanic; black, non-Hispanic; other, non-Hispanic; Hispanic; and 2+races, non-Hispanic. Education was collapsed to create a nominal variable low (no formal education through 12th grade no diploma), medium (high school graduate – high school diploma or the equivalent (GED) and some college, no degree), and high (associate degree through professional or doctorate degree). Income was collapsed to create a categorical variable low (below \$5000 to \$29,999), medium (\$30,000 to \$99,999), and high (\$100,000 or more).

Data Analysis Plan

The data analysis was conducted utilizing IBM SPSS Software version 21. SPSS is a widely used large data analysis software because of its effort and time saving (Masood & Lodhi, 2016). SPSS performs data-oriented tasks, statistical procedures, fundamental procedures, and multivariate procedures (Guarino, Gamst, & Meyers, 2013). HRMS questions not asked of respondents are noted with a missing value variable and for questions the respondent did not answer they are labeled refused or have a value of -1; this is the same for any question that is skipped (Holahan & Long, 2015). Regression-

based methods were used to input values for missing information of family size and family income (Urban Institute, 2016b). The item nonresponse is considered to be generally low with less than 3% and the missing values are not imputed (Urban Institute, 2016b).

This study was conducted to address the following questions:

RQ1: Quantitative: What is the relationship between HIL and enrollment in HI among U.S. nonelderly adults?

- H_01 : There is no statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult
- H_a1 : There is statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult population.

RQ2: Quantitative: What is the relationship between HIL and enrollment in a marketplace HI plan among U.S. nonelderly adults?

- H_02 : There is no statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult
- H_a2 : There is statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult population.

RQ3: Quantitative: What is the relationship between HIL and satisfaction with HI among U.S. nonelderly adults?

- H_03 : There is no statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult

- H_{a3} : There is statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult population.

The analysis plan was to conduct binary logistic regression analysis, which allows for predicting categorical outcomes with either continuous or categorical predictors (Field, 2013).

The logistic regression models allowed for the examination of the odds ratio to measure the relationship between the independent variable and the dependent variable (Szumilas, 2010). The information on the strength of the relationship between the independent and dependent variable is the odds ratio (McHugh, 2009). The odds ratio results are interpreted as: 1 means the two variables are equal; greater than 1 means the first variable is more likely to experience the outcome than the second; less than 1 means the first variable is less likely to experience the outcome, however this also is considered to not be directly interpretable (McHugh, 2009). Both the unadjusted and adjusted odds ratio was determined based on controlling or not controlling the confounding variables to determine possible influence on the dependent variable.

When conducting the binary logistic regression model to respond to RQ1, HI enrollment was the dependent variable and the HIL level of the terms and sociodemographic factors was the independent variables. When conducting the binary logistic regression model to respond to RQ2, marketplace enrollment was the dependent variable and the HIL level of the terms and sociodemographic factors were independent variables. When conducting the binary logistic regression model to respond to RQ3, the satisfaction level with access to care and cost of care activities were the dependent

variables and the HIL level and sociodemographic factors were the independent variables. The data analysis focused on four predictive relationships: (a) the odds of enrollment in HI in relation to the level of HIL as measured by confidence in HI terms, (b) the odds of marketplace enrollment in relation to the level of HIL as measured by confidence in HI terms, (c) the odds of satisfaction with access to care in relation to the level of HIL as measured by confidence in HI terms, and (d) the odds of satisfaction with cost of care in relation to the level of HIL as measured by confidence in HI activities.

The Wald test used a p-value >0.05 to determine statistical significance and confidence interval of 95% was used to estimate the precision of the odds ratio (Salkind, 2007). A p-value <0.05 indicated there is no statistical significance. The confidence interval of 95% was used to estimate the precision of the odds ratio, which indicated if large a low level of precision and if small a high level of precision (Szumilas, 2010). The Wald test is the z-statistic that follows normal distribution and determines if the predictor is significantly different from zero resulting in a significant contribution to the predicted outcome (Field, 2013). Goodness of fit was tested using the Hosmer-Lemeshow model fit test. A p-value greater than 0.05 was considered a good fit and indicated little variability (Hilbe, 2009).

Threats to Validity

External threats to validity is the determination if the research findings can be generalized over a larger population (Lewis-Beck, Bryman, & Futing Lao, 2004).

Through careful construction of the research design, the researcher can ensure external validity is present (Lewis-Beck, Bryman, & Futing Lao, 2004). The three threats to

external validity include non-representative samples, artificial laboratory environment, and testing effects (Lewis-Beck, Bryman, & Futing Lao, 2004). This study does not use artificial laboratory environment or testing, which leaves the potential threat of non-representative samples. The HRMS utilizes post-stratification weights based on the Current Population Survey and Pew Hispanic Center Survey benchmarks to adjust the sample to be representative of the U.S. population (Long et al., 2014). The sample is obtained through KnowledgePanel®, which has a strong track record of supporting policy research in education, research organizations, and government agencies (Long et al., 2014).

Internal validity is most relevant in studies that attempt to establish causal relationships (Trochim, 2006). Threats to internal validity include history, maturation, testing, instrumentation, statistical regression, experimental morality, and selection-history interactions (Lewis-Beck, Bryman, Futing Laio, 2004). This study is a cross-sectional study and not a longitudinal study, which is an observational study that conducts several observations of the same sample over time (Mathison, 2005). The HRMS utilizes KnowledgePanel® for its sample where fresh samples are drawn each round of the HRMS based on the use of KnowledgePanel®'s unique identifier, which allows for control in sample overlap (Urban Institute, 2016b). KnowledgePanel®'s household recruitment rate is approximately 14% who are required to complete a detailed demographic and socioeconomic information (Urban Institute, 2016b). The completion rate for the initial survey of background information is approximately 64%, which is the sample pool KnowledgePanel® uses for surveys (Urban Institute, 2016b).

Construct validity consists of six aspects: content, substantive processes, score structure, generalizability, external relationships, and testing consequences (Messick, 1998). Evaluating this study's constructs validity against the six aspects demonstrates no existing threats. The survey questions asked of the sample population align with addressing HI questions about their level of confidence for HI related terms and health care activities to determine HIL levels (Urban Institute, 2015). The content domain being measured; knowledge, skills, and abilities; of the sample population cover the required aspects of HI, as well as being appropriately defined and objective in nature (Messick, 1998). The completion rate of the HRMS does introduce some risk of nonresponse bias; however, nonresponse bias is mitigated through weighting of the probability of sample selection and post-stratification of characteristics using benchmarks from the Current Population Survey and the Pew Hispanic Center Survey (Urban Institute, 2016b). These same benchmarks are used to adjust the sample to be representative of the U.S. population; thus producing generalizability (Long et al., 2014). Based on the comparisons to the National Health Interview Survey (NHIS) and the American Community Survey (ACS), the demonstrated overlap in measures supports the HRMS to be a credible source when monitoring effects of the ACA and its ability for adding supplemental questions could provide more timely information ahead of federal survey data (Long et al., 2014).

Ethical Procedures

Ethical and methodological issues must be considered with a researcher is utilizing secondary data (McGinn, 2008). The challenge to secondary data usage is the participants' autonomy and limitation to provide informed consent to the secondary

research (McGinn, 2008). The HRMS utilizes KnowledgePanel® to draw samples, individuals are provided with a unique identifier to control of overlap across bi-annual survey rounds (Urban Institute, 2016b). The use of KnowledgePanel® is considered an acceptable platform for academic and organizational research studies and governmental policy and program evaluations (GfK Custom Research, 2013). KnowledgePanel® is a probability-based internet panel that is nationally representative of those living in the U.S. (Urban Institute, 2016b). The confidentiality of participants is protected in the public-use version of the data by recoding three responses related to census region, deductible amount, and out-of-pocket health care costs (Holahan & Long, 2015).

The Inter-University Consortium for Political and Social Research (ICPSR) distributes the public and restricted use of the HRMS data files. Access to the restricted use data file version is available through an application with ICPSR; note this study does not require the use of restricted data files. ICPSR does require each user to create a free MyData account to allow access to notification features and the ability to download data available to only ICPSR member institutions (ICPSR, 2016b). The data was not reviewed until the Walden University Institutional Review Board (IRB) received and approved the request application post-proposal approval, approval number 07-05-17-0541421.

Summary

This quantitative, cross-sectional correlation design utilizing secondary data from the HRMS third Quarter 2015, 10th round attempted to address the gap that exists in the literature regarding the relationship between HIL, HI enrollment, and satisfaction with HI. The sample size of approximately 7,500 nonelderly U.S. adults ages 18 to 64 with

oversampling included for adults with low-income is obtained through KnowledgePanel® (Urban Institute, 2016b). Utilizing G*Power a total sample size was determined to be 104 with an actual power of 0.95 (Faul et al., 2009). The variables for this study were obtained through the HRMS survey questions that specifically address level of confidence in understanding HI terms, level of confidence in eight HI activities, enrollment, and satisfaction with HI (Urban Institute, 2015). The use of SPSS software allowed for conducting binary logistic regression analysis, as well as tests to explain variation in measure, assessment of predictors' contributions, and goodness of fit (Field, 2013). External and construct threats are addressed through post-stratification weights based on federal survey benchmarks and internal threats are avoided through the use of the KnowledgePanel® to obtain the sample population (Urban Institute, 2015). The use of secondary data reduces issues related to ethical procedures, including the ability to retrieve the dataset from the Inter-University Consortium for Political and Social Research (ICPSR), which does not require prior approval for publically available data. Chapter 4 will address the data collection and results.

Chapter 4: Results

Introduction

This quantitative, cross-sectional correlation study addressed the gap that exists in the literature regarding the relationship between HIL, individuals' HI enrollment, and individuals' satisfaction with their HI. The study consists of one independent variable, HIL, and the dependent variables: enrollment in HI, enrollment in a marketplace HI plan, and satisfaction with HI. The control variables selected from sociodemographic factors, such as age, gender, race, education, and income, were controlled during the logistic regression analysis. The quantitative design allowed for the testing of relationships between variables from a secondary dataset HRMS.

This study addressed the first research question, which asked, what is the relationship between HIL and enrollment in HI among U.S. nonelderly adults? The null hypothesis was that there is no statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult. The alternative hypothesis was that there is statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult population. The second research question asked, what is the relationship between HIL and enrollment in a marketplace HI plan among U.S. nonelderly adults? The null hypothesis was that there is no statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult. The alternative hypothesis was that there is statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult population. The third research question asked, what is the relationship between HIL and satisfaction with HI among U.S. nonelderly adults? The null hypothesis

was that there is no statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult. The alternative hypothesis was that there is statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult population.

This chapter provides the study's data collection period and recruitment through the use of the secondary dataset, HRMS, the baseline characteristics through univariate analyses, and the results of the binary logistic regression models.

Data Collection

Data was analyzed from HRMS' third Quarter 2015, with collection occurring in the month of September via the web-based survey (Holahan & Long, 2017). A total of 7,648 respondents was used for the study's analysis (Holahan & Long, 2017). The sample was drawn from 50,000 U.S. household participants within KnowledgePanel® (Urban Institute, 2016b). The HRMS cumulative response rate is approximately 5% for each round based, which is the product of the panel household recruitment rate, panel household profile rate, and HRMS completion rate (Holahan & Long, 2017).

Baseline demographic characteristics of the HRMS are shown in Table 2. The highest frequency demographic characteristics of the HRMS participants at the time of the survey included age 35 – 54 (41.9%), female gender (50.3%), white-non-Hispanic race (68.6%), medium education level (47.8%), and medium income (48.4%), as shown in Table 2.

Table 2

Baseline Demographic Characteristics

Characteristic (N=7648)	Frequency Percent
Age	
18-34	27.7
35-54	41.9
55-64	30.4
Gender	
Male	49.7
Female	50.3
Race	
White, non-Hispanic	68.6
Black, non-Hispanic	9.8
Other, non-Hispanic	3.6
Hispanic	15.3
2+ races, non-Hispanic	2.7
Education	
Low= no formal education through 12 th grade no diploma	9.5
Medium= high school graduate – high school diploma or the equivalent (GED) and some college, no degree	47.8
High= associate degree through professional or doctorate degree	42.7
Income	
Low= Less than \$5,000 to \$29,999	25.1
Medium= \$30,000 to \$99,999	48.4
High= \$100,000 or more	26.5

Results

Descriptive statistics were run for the independent and dependent variables, as shown in Table 3. At the time of the HRMS, the highest frequency descriptive statistics for the independent variables included high confidence HIL with HI terms (64.7%) and high confidence HIL with HI activities (58.7%), as shown in Table 3. The highest frequency descriptive statistics for the dependent variables included enrolled in HI (90.7%) and not enrolled in marketplace HI (87.3%), as shown in Table 3. The highest frequency descriptive statistics for the dependent variables on satisfaction included

satisfied with range of services available and choice of doctors (68%) and satisfied with premium, share of costs, and medical bill protection (51.5%), as shown in Table 3.

Table 3

Descriptive Statistics

Variable (N=7648)	Frequency Percentage
Independent Variables:	
Health insurance literacy with health insurance terms	
Low= very confident, somewhat confident with 0-2 terms	17.5
Medium= very confident, somewhat confident with 3-5 terms	17.8
High= very confident, somewhat confident with 6-7 terms	64.7
Health insurance literacy with health insurance activities	
Low= very confident, somewhat confident with 0-2 activities	24.2
Medium= very confident, somewhat confident with 3-5 activities	17.1
High= very confident, somewhat confident with 6-8 activities	58.7
Dependent Variables:	
Enrollment in Health Insurance	
Covered	90.7
Not covered	9.3
Enrollment in Marketplace Coverage	
Yes, I am enrolled in a health insurance plan through the marketplace	12.7
No, I am not enrolled in a health insurance plan through the marketplace.	87.3
Satisfaction with Access to Care	
Yes, very satisfied, somewhat satisfied with range of services available and choice of doctors.	68.0
No, somewhat dissatisfied, very dissatisfied with range of services available and choice of doctors.	32.0
Satisfaction with Cost of Care	
Yes, very satisfied, somewhat satisfied with premium, share of costs, and medical bill protection.	51.5
No, somewhat dissatisfied, very dissatisfied with premium, share of costs, and medical bill protection.	48.5

Research Question 1

Research Question 1 was What is the relationship between HIL and enrollment in HI among U.S. nonelderly adults? The null hypothesis was there is no statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult. The alternative hypothesis was there is statistical significance between HIL and enrollment in HI for the U.S. nonelderly adult population.

The hypothesis for research question one was first tested using a simple logistic regression model. The level of HIL with HI terms, Wald $X^2 = 3345.078$, $df= 1$, $p<.001$, was a statistically significant predictor of the enrollment in HI; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p = 1.0$, indicated the model was a good fit for the data. The model explained 32 to 70% of the variance in enrollment in HI and correctly predicted 90.7% of the participants.

The odds ratio for HIL with terms (ExpB= 4.243, CI [3.565, 5.050]) indicated high HIL participants with HI terms had 4.2 times higher odds than those with low HIL to be enrolled in HI, as shown in Table 4. The odds ratios for HIL with terms (ExpB=2.919, CI [2.322, 3.668]) indicated medium HIL participants with HI terms had 2.9 times higher odds than those with low HIL to be enrolled in HI, as shown in Table 4. Both high and medium HIL with HI terms were associated with significantly higher odds to be enrolled in HI, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 4

Health Insurance Literacy and Enrollment in Health Insurance

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance terms (N=7648)					
High= very confident, somewhat confident with 6-7 terms	1.445	0.000	4.243	3.565	5.050
Medium= very confident, somewhat confident with 3-5 terms	1.071	0.000	2.919	2.322	3.668
Constant	1.277	0.000	3.588		

The application of control variables with the multiple logistic regression model for high and medium HIL with HI terms and enrollment in HI produced significantly higher odds. The level of HIL with HI terms, Wald $X^2 = 3345.078$, $df = 1$, $p < .001$, was a statistically significant predictor of the enrollment in HI; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p > 1.0$, indicated the model was a good fit for the data. The model explained 8.4 to 18.1% of the variance in enrollment in HI and correctly predicted 90.7% of the participants.

The odds ratio for HIL with terms (ExpB= 2.103, CI [1.733, 2.552]) indicated high HIL participants with HI terms had 2.1 times higher odds than those with low HIL to be enrolled in HI, as shown in Table 5. The odds ratios for HIL with terms (ExpB=1.987, CI [1.563, 2.526]) indicated medium HIL participants with HI terms had 99% higher odds than those with low HIL to be enrolled in HI, as shown in Table 5. Both

high and medium HIL with HI terms were associated with significantly higher odds to be enrolled in HI, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 5

<i>Health Insurance Literacy and Enrollment in Health Insurance with control variables</i>					
	B	<i>p</i> -value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance terms ($N=7648$)					
High= very confident, somewhat confident with 6-7 terms	0.743	0.000	2.103	1.733	2.552
Medium= very confident, somewhat confident with 3-5 terms	0.687	0.000	1.987	1.563	2.526
Age (18-34)	0.743	0.000	2.103	1.733	2.552
Age (35-54)	0.687	0.000	1.987	1.563	2.526
Education (High)	0.735	0.000	2.086	1.580	2.754
Education (Medium)	0.249	0.028	1.283	1.027	1.604
Race (White, non-Hispanic)	0.547	0.016	1.728	1.109	2.694
Race (Black, non-Hispanic)	0.284	0.252	1.329	0.817	2.161
Race (Other, non-Hispanic)	0.909	0.015	2.481	1.191	5.167
Race (Hispanic)	-0.206	0.377	0.813	0.515	1.286
Gender (Male)	-0.216	0.010	0.806	0.684	0.949
Income (High= \$100,000 or more)	1.960	0.000	7.099	4.881	10.324
Income (Medium= \$30,000 to \$99,999)	0.667	0.000	1.948	1.633	2.324
Constant	0.867	0.001	2.380		

Research Question 2

The second research question was What is the relationship between HIL and enrollment in a marketplace HI plan among U.S. nonelderly adults? The null hypothesis was There is no statistical significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult. The alternative hypothesis was There is statistical

significance between HIL and enrollment in a marketplace HI plan for the U.S. nonelderly adult population.

The hypothesis for Research Question 2 was first tested using a simple logistic regression model. The level of HIL with HI terms, Wald $X^2 = 3150.369$, $df = 1$, $p < .001$, was a statistically significant predictor of the enrollment in marketplace coverage; therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p = 1.0$, indicated the model was a good fit for the data. The model explained 8 to 16% of the variance in enrollment in marketplace coverage and correctly predicted 87.3% of the participants.

The odds ratio for HIL with terms (ExpB= 1.811, CI [1.530, 2.143]) indicated high HIL participants with HI terms had 81% higher odds than those with low HIL to be enrolled in marketplace HI, as shown in Table 6. The odds ratios for HIL with terms (ExpB=1.066, CI [0.871, 1.303]) indicated medium HIL participants with HI terms had 6.6% higher odds than those with low HIL to be enrolled in marketplace HI, as shown in Table 6. Both high and medium HIL with HI terms were significantly higher odds to be enrolled in marketplace HI, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 6

Health Insurance Literacy and Enrollment in Marketplace Coverage

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance terms (N=7648)					
High= very confident, somewhat confident with 6-7 terms	0.594	0.000	1.811	1.530	2.143
Medium= very confident, somewhat confident with 3-5 terms	0.064	0.000	1.066	0.871	1.303
Constant	1.559	0.000	4.754		

The application of control variables with the multiple logistic regression model for high and medium HIL with HI terms and enrollment in marketplace HI resulted in significantly higher odds. The level of HIL with HI terms was a statistically significant predictor of the enrollment in marketplace coverage, (Wald $X^2 = 3150.369$, $df = 1$, $p < .001$); therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p > 1.0$, indicated the model was a good fit for the data. The model explained 5.2 to 9.7% of the variance in enrollment in marketplace coverage and correctly predicted 87.3% of the participants.

The odds ratios for HIL with terms (ExpB=0.768, CI [0.621, 0.950]) indicated medium HIL participants with HI terms had 23.2% lower odds than those with low HIL to be enrolled in marketplace HI, as shown in Table 7. Medium HIL with HI terms had significantly lower odds to be enrolled in marketplace HI ($p=0.015$).

Table 7

Health Insurance Literacy and Enrollment in Marketplace Coverage with control variables

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance terms (N=7648)					
High= very confident, somewhat confident with 6-7 terms	0.054	0.572	1.056	0.875	1.274
Medium= very confident, somewhat confident with 3-5 terms	-0.263	0.015	0.768	0.621	0.950
Age (18-34)	0.159	0.083	1.172	0.979	1.402
Age (35-54)	0.278	0.001	1.320	1.115	1.563
Education (High)	0.073	0.561	1.076	0.841	1.377
Education (Medium)	-0.017	0.876	0.983	0.790	1.222
Race (White, non-Hispanic)	0.111	0.619	1.117	0.722	1.728
Race (Black, non-Hispanic)	-0.113	0.640	0.893	0.557	1.433
Race (Other, non-Hispanic)	-0.442	0.116	0.643	0.370	1.116
Race (Hispanic)	-0.760	0.001	0.468	0.298	0.734
Gender (Male)	0.085	0.236	1.088	0.946	1.252
Income (High= \$100,000 or more)	1.461	0.000	4.308	3.363	5.520
Income (Medium= \$30,000 to \$99,999)	0.663	0.000	1.942	1.660	2.271
Constant	1.255	0.000	3.508		

Research Question 3

The third research question was: What is the relationship between HIL and satisfaction with HI among U.S. nonelderly adults? The null hypothesis was: There is no statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult. The alternative hypothesis was: There is statistical significance between HIL and satisfaction with HI for the U.S. nonelderly adult population.

The hypothesis for research question three was first tested using a simple logistic regression model. The level of HIL with HI activities, Wald $X^2 = 1831.747$, $df = 1$, $p < .001$, was a statistically significant predictor of satisfaction with access to care; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p = 1.0$, indicated the model was a good fit for the data. The model explained 20.3 to 30.3% of the variance in satisfaction with access to care and correctly predicted 81.6% of the participants.

The odds ratio for HIL with activities (ExpB= 12.846, CI [11.260, 14.656]) indicated high HIL participants with HI activities had 12.8 times higher odds than those with low HIL participants to have high satisfaction with access to care, as shown in Table 8. The odds ratios for HIL with activities (ExpB= 9.257, CI [7.743, 11.066]) indicated medium HIL participants with HI activities had 9.3 times higher odds than those with low HIL to have high satisfaction with access to care, as shown in Table 8. Both high and medium HIL with HI activities were significantly higher odds to have high satisfaction with access to care, (high HIL $p = 0.000$, medium HIL $p = 0.000$).

Table 8

Health Insurance Literacy and Satisfaction with Access to Care

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance activities (N=7648)					
High= very confident, somewhat confident with 6-8 activities	2.553	0.000	12.846	11.260	14.656
Medium= very confident, somewhat confident with 3-5 activities	2.225	0.000	9.257	7.743	11.066
Constant	-0.49	0.000	0.613		

The application of control variables with the multiple logistic regression model for high HIL with HI activities and satisfaction with access to care resulted in significantly higher odds. The level of HIL with HI activities, Wald $X^2 = 1831.747$, $df = 1$, $p < .001$, was a statistically significant predictor of satisfaction with access to care; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p > 1.0$, indicated the model was a good fit for the data. The model explained 23.2 to 34.6% of the variance in satisfaction with access to care and correctly predicted 82.6% of the participants.

The odds ratio for HIL with activities (ExpB= 10.761, CI [9.394, 12.327]) indicated high HIL participants with HI activities had 10.8 times higher odds than those with low HIL participants to have high satisfaction with access to care, as shown in Table 9. The odds ratios for HIL with activities (ExpB= 7.836, CI [6.526, 9.409]) indicated medium HIL participants with HI activities had 7.8 times higher odds than those with low

HIL to have high satisfaction with access to care, as shown in Table 9. Both high and medium HIL with HI activities were significantly higher odds to have high satisfaction with access to care, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 9

Health Insurance Literacy and Satisfaction with Access to Care with control variables

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance activities (N=7648)					
High= very confident, somewhat confident with 6-8 activities	2.376	0.000	10.761	9.394	12.327
Medium= very confident, somewhat confident with 3-5 activities	2.059	0.000	7.836	6.526	9.409
Age (18-34)	-0.571	0.000	0.565	0.480	0.665
Age (35-54)	-0.256	0.001	0.774	0.662	0.905
Education (High)	-0.463	0.000	0.630	0.502	0.789
Education (Medium)	-0.290	0.000	0.749	0.649	0.864
Race (White, non-Hispanic)	0.438	0.015	1.549	1.091	2.200
Race (Black, non-Hispanic)	0.422	0.036	1.525	1.028	2.262
Race (Other, non-Hispanic)	0.541	0.027	1.717	1.063	2.775
Race (Hispanic)	0.248	0.195	1.281	0.881	1.862
Gender (Male)	-0.319	0.000	0.727	0.641	0.823
Income (High= \$100,000 or more)	-0.935	0.000	0.393	0.322	0.479
Income (Medium= \$30,000 to \$99,999)	-0.391	0.000	0.677	0.567	0.807
Constant	0.344	0.094	1.411		

The level of HIL with health insurance activities, Wald $X^2 = 7.157$, $df = 1$, $p < .001$, was a statistically significant predictor of satisfaction with cost of care; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p = 1.0$, indicated the model was a good fit for the data. The model

explained 15.7 to 20.9% of the variance in satisfaction with cost of care and correctly predicted 68.1% of the participants.

The odds ratio for HIL with activities (ExpB= 8.802, CI [7.708, 10.051]) indicated high HIL participants with HI activities had 8.8 times higher odds than those with low HIL participants to have high satisfaction with cost of care, as shown in Table 10. The odds ratios for HIL with activities (ExpB= 3.758, CI [3.203, 4.410]) indicated medium HIL participants with HI activities had 3.7 times higher odds than those with low HIL to have high satisfaction with cost of care, as shown in Table 10. Both high and medium HIL with HI activities were significantly higher odds to have high satisfaction with cost of care, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 10

Health Insurance Literacy and Satisfaction with Cost of Care

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance activities (N=7648)					
High= very confident, somewhat confident with 6-8 activities	2.175	0.000	8.802	7.708	10.051
Medium= very confident, somewhat confident with 3-5 activities	1.324	0.000	3.758	3.203	4.410
Constant	-1.480	0.000	0.228		

The application of control variables with the multiple logistic regression model for high and medium HIL with HI activities and satisfaction with cost of care resulted in significantly higher odds. The level of HIL with HI activities, Wald $X^2 = 7.157$, $df= 1$,

$p < .001$, was a statistically significant predictor of satisfaction with cost of care; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The Hosmer and Lemeshow Test, $p > 1.0$, indicated the model was a good fit for the data. The model explained 16 to 21.3% of the variance in satisfaction with cost of care and correctly predicted 68.1% of the participants.

The odds ratio for HIL with activities (ExpB= 8.903, CI [7.761, 10.214]) indicated high HIL participants with HI activities had 8.9 times higher odds than those with low HIL participants to have high satisfaction with cost of care, as shown in Table 11. The odds ratios for HIL with activities (ExpB= 3.789, CI [3.218, 4.462]) indicated medium HIL participants with HI activities had 3.8 times higher odds than those with low HIL to have high satisfaction with cost of care, as shown in Table 11. Both high and medium HIL with HI activities were significantly higher odds to have high satisfaction with cost of care, (high HIL $p=0.000$, medium HIL $p=0.000$).

Table 11

Health Insurance Literacy and Satisfaction with Cost of Care with control variables

	B	p-value	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Health Insurance Literacy with health insurance activities (N=7648)					
High= very confident, somewhat confident with 6-8 activities	2.186	0.000	8.903	7.761	10.214
Medium= very confident, somewhat confident with 3-5 activities	1.332	0.000	3.789	3.218	4.462
Age (18-34)	-0.033	0.618	0.967	0.849	1.102
Age (35-54)	-0.136	0.024	0.873	0.776	0.982
Education (High)	0.037	0.718	1.038	0.849	1.268
Education (Medium)	-0.054	0.572	0.947	0.784	1.144
Race (White, non-Hispanic)	0.167	0.290	1.182	0.867	1.611
Race (Black, non-Hispanic)	0.209	0.232	1.232	0.875	1.735
Race (Other, non-Hispanic)	0.030	0.882	1.031	0.692	1.536
Race (Hispanic)	0.301	0.075	1.352	0.970	1.884
Gender (Male)	-0.146	0.004	0.864	0.783	0.954
Income (High= \$100,000 or more)	-0.010	0.901	0.990	0.848	1.157
Income (Medium= \$30,000 to \$99,999)	-0.117	0.075	0.890	0.782	1.012
Constant	-1.462	0.000	0.232		

Summary

A total of 7,486 participants of the HRMS third Quarter 2015 web-based survey was used for this study's analysis. Binary logistic regression analysis was conducted to focus on four predictive relationships (a) the odds of enrollment in HI in relation to the level of HIL as measured by confidence in HI terms, (b) the odds of marketplace enrollment in relation to the level of HIL as measured by confidence in HI terms, (c) the odds of satisfaction with access to care in relation to the level of HIL as measured by

confidence in HI terms, and (d) the odds of satisfaction with cost of care in relation to the level of HIL as measured by confidence in HI activities. The Wald test was used to determine statistical significance and confidence interval was used to estimate the precision of the odds ratio.

According to the first multiple logistic regression model, HIL with HI terms was a statistically significant predictor of increased enrollment in HI resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with terms indicated high and medium HIL participants with HI terms are more likely than those with low HIL to be enrolled in HI.

Based on the second multiple logistic regression model, HIL with HI terms was a statistically significant predictor of enrollment in marketplace coverage resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with terms indicated medium HIL participants with HI terms are more likely than those with low HIL to be enrolled in marketplace HI.

Based on the third multiple logistic regression model, HIL with HI activities was a statistically significant predictor of satisfaction with access to care resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with activities indicated high and medium HIL participants with HI terms are more likely than those with low HIL to be satisfied with access to care.

Based on the last multiple logistic regression model, HIL with HI activities was a statistically significant predictor of satisfaction with cost of care resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL

with activities indicated high and medium HIL participants with HI activities are more likely than those with low HIL to be satisfied with cost of care.

Chapter 5 provides an interpretation of the findings, limitations to the study, recommendations, and implications for positive social change.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

The purpose of this quantitative study was to address the existing gap in the literature regarding the exploration of the relationship between HIL, individuals' HI enrollment and individuals' satisfaction with their HI. The quantitative design allowed for testing of the relationships between variables and a secondary dataset: HRMS. The quantitative cross-sectional correlation design consisted of the independent variable HIL, the dependent variables enrollment in HI, enrollment in marketplace HI, and satisfaction with HI; and the confounding variables including sociodemographic factors of age, gender, race, education, and income. Binary logistic regression analysis tested hypotheses of four predictive relationship between variables: (a) the odds of enrollment in HI in relation to the level of HIL as measured by confidence in HI terms, (b) the odds of marketplace enrollment in relation to the level of HIL as measured by confidence in HI terms, (c) the odds of satisfaction with access to care in relation to the level of HIL as measured by confidence in HI terms, and (d) the odds of satisfaction with cost of care in relation to the level of HIL as measured by confidence in HI activities.

A total of 7,486 participants of the HRMS third Quarter 2015 web-based survey resulted in identifying HI terms literacy was a statistically significant predictor of increased enrollment in HI. According to the first multiple logistic regression model, HIL with HI terms was a statistically significant predictor of increased enrollment in HI resulting in the null hypothesis being rejected and the alternative hypothesis accepted.

The odds ratio for HIL with terms indicated high and medium HIL participants with HI terms are more likely than those with low HIL to be enrolled in HI.

Based on the second multiple logistic regression model, HIL with HI terms was a statistically significant predictor of enrollment in marketplace coverage resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with terms indicated medium HIL participants with HI terms are more likely than those with low HIL to be enrolled in marketplace HI.

Based on the third multiple logistic regression model, HIL with HI activities was a statistically significant predictor of satisfaction with access to care resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with activities indicated high and medium HIL participants with HI terms are more likely than those with low HIL to be satisfied with access to care.

Based on the last multiple logistic regression model, HIL with HI activities was a statistically significant predictor of satisfaction with cost of care resulting in the null hypothesis being rejected and the alternative hypothesis accepted. The odds ratio for HIL with activities indicated high and medium HIL participants with HI activities are more likely than those with low HIL to be satisfied with cost of care.

Interpretation of the Findings

The findings of this study confirmed and extended the knowledge within HIL literature on enrollment in HI, enrollment in marketplace HI, and satisfaction with HI.

Enrollment in Health Insurance

The level of HIL with HI terms was a statistically significant predictor of the enrollment in HI; therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This study confirmed the relationship between level of confidence in understanding HI terms and enrollment in HI previously studied, where 49.3% of insured respondents were confident with the terms and uninsured experienced 23.6% confidence (Long et al., 2014). The two studies utilize the HRMS to identify HIL with HI terms measured by confidence level as a predictor of enrollment in HI, however the Long et al. (2014) study expands their study by addressing the relationship to English versus bilingual or Spanish speakers, as well as region location. Additionally, Long et al. (2014) analyzes the source of health information, which is not within this study's scope.

A study conducted on the knowledge of HI terminology identified the insurance term *coinsurance* resulted in 67% *no understanding*, followed by the insurance term *deductible* at 55% *no understanding* (Politi et al., 2014). Politi et al. (2014) differed in many ways, including the qualitative study sample of uninsured, low-income African Americans and the investigation of both knowledge and preferences. The use of interviews allowed for the researcher to identify common sources of confusion, differences in understanding, and individual importance of insurance features. These areas were not included in this study due to the nature of the quantitative study approach.

An additional study provided analysis of two surveys in a comprehensive study showed that only 14% of the sample could correctly respond to HIL terms *deductibles*, *copays*, *coinsurance*, and *maximum out of pocket costs* (Lowenstein et al., 2013).

Similarly, this study demonstrated high HIL participants with HI terms had 4.2 times higher odds than those with low HIL to be enrolled in HI. Lowenstein et al.'s (2013) respondents were limited to those who have HI through their own or family member's employer, where this study consisted of insured and noninsured individuals. The additional difference of my study to Lowenstein et al. (2013) includes the exploration of HI decision making based on a hypothetical plan.

Enrollment in Marketplace Health Insurance

The level of HIL with HI terms was a statistically significant predictor of the enrollment in marketplace coverage; therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This study surprisingly indicated a high HIL participants with HI terms had 81% higher odds than those with low HIL to be enrolled in marketplace HI. In prior research, the level of confidence with HI terms among respondents who were enrolled in marketplace HI was 29% when surveyed during the HRMS Quarter 2 2013 (Long et al., 2014). HIL differentials were identified among the marketplace enrolled between the population age, those ages 18-30 were 29% confident with all HI terms and 50.1% confident for those ages 50-64 (Long et al., 2014). This study demonstrated higher odds for those individuals with low HIL enrolled in marketplace HI than Long et al. (2014). Additionally, a difference between the two studies was a deeper investigation by Long et al. (2014) related to language and regional location.

Satisfaction with Access to Care

The level of HIL with HI activities was a statistically significant predictor of satisfaction with access to care; therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This study indicated high HIL participants with HI activities had 12.8 times higher odds than those with low HIL participants to have high satisfaction with access to care. This confirmed results from a previous comparative study utilizing data collected from September 2013 to March 2015, where 16.4% of respondents in March 2015 experienced problems with access to care (Shartzter et al., 2016). The respondents were more likely to be young, female, Hispanic, and low income (Shartzter et al., 2016). Shartzter et al. (2016) used the HRMS for their comparative study that focused primarily on access to care and affordability, the researchers did not include in their study HIL or satisfaction. My study remains unique in its contribution by assessing the HIL relationship and impact on levels of satisfaction.

Satisfaction with Cost of Care

The level of HIL with HI activities was a statistically significant predictor of satisfaction with cost of care; therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This study indicated high HIL participants with HI activities had 8.8 times higher odds than those with low HIL participants to have high satisfaction with cost of care. Previously studied, the cost of care showed a 2.7% decreased between March 2015 and September 2013, resulting in the report of unmet need for care due to cost (Shartzter et al., 2016). Additionally, a 2016 qualitative study of focus groups in the state of Connecticut confirmed low levels of HIL in their target

populations attributed to a greater need for understanding cost of care or the ability to discuss prices with providers (FAIR Health, Inc., 2017).

Theoretical Framework

Behavioral economics provides clarity and productive insights in the determination of insurance enrollment selection and effectiveness of policies that impact uninsured (Baicker et al., 2012). Behavior is the underlining of choice when faced with uncertainty in the exploration of medical decision making (Verma et al., 2014). Previous application of behavioral economics in the identification of effective problem-solving produced positive results during HI reform and marketplace exchange strategizing (Baicker et al., 2012).

Prospect theory is useful and supports the exploration of the relationship between HIL, HI enrollment, and satisfaction with HI. The choice of HI enrollment was influenced by the individuals' gains and losses that are based on assumption of risk, not reduction or level of uncertainty (Schneider, 2004). The occurrence of loss with certainty and the individuals' risk aversion determines their HI enrollment and is motivated by gains based on risk level (Schneider, 2004). Attributing to sophisticated decision making, individual bias and difference in balancing risks and benefits are applied with thinking in terms of relative, not absolute (Verma et al., 2014). The prospect theory model, when applied to the exploration of the relationships within this study, supported the individuals' simplification of choice, the use of point of reference decision making, and the option valuation applied. The use of behavioral economics, specifically prospect

theory, assists in the identification of problems, choice of coverage, strategy for efficient enrollment, and enrollment encouragement.

Limitations of the Study

The largest limitation to the study was the use of the secondary dataset, HRMS, which limited the methodology to the quantitative design. The survey questions used to collect the data were created by the HRMS developers; however, it is important to note that the questions were based on federal government surveys such as “American Community Survey, the Behavioral Risk Factor Surveillance System, the Annual Social and Economic Supplement to the Current Population Survey, and the National Health Interview Survey” (Urban Institute, 2016a). The HRMS completion rate is 60% with a cumulative response rate of 5%, which is the survey completion rate, rate of panel recruitment, and rate of panel participation over time (Urban Institute, 2016b). The completion rate may be considered low; however, it is representative of the sample population with some risk to nonresponse bias (Urban Institute, 2016b).

Bias may be attributed to measurement error and misclassification with three main sources (a) confounding, (b) information bias, and (c) selection bias requiring bias correction (Spiegelman, 2016). Cross-sectional designs are affected by non-response and can result in outcome measurement bias. The nonresponse bias is “mitigated through weighting of the probability of sample selection and post-stratification of characteristics using benchmarks from the Current Population Survey and the Pew Hispanic Center Survey” (Urban Institute, 2016b). These same benchmarks are used to adjust the sample to be representative of the U.S. population; thus producing generalizability (Long et al.,

2014). The generalizability of the study is specific to U.S. adults ages 18 – 64 and was not generalized for children newborn to 17 and adults over 64 years old.

Additional bias exists with the utilization of confounding variables. Confounding variables may affect the outcome variable and by controlling the confounding variable the adjusted odds ratio is produced (Pourhoseingholi et al., 2012). This study consisted of confounding variables that were sociodemographic factors including age, education, race, gender, and income. The selection of control variables beyond those used in this survey may demonstrate additional influence such as household size, housing type, marital status, employment status, citizenship, and state. The HRMS may not accurately and completely measure HIL which is dependent on other potential measurement tools, variation in survey questions, or utilization of demonstration of HIL in other studies.

Causal relationships exist between two variables when the following three criteria are met (a) association between variables, (b) appropriate time order, and (c) elimination of other variables (Covles & Schroeder, 2015). The correlations identified in this study between HIL and HI should not be mistaken for causation or as valid explanations, since correlation is not sufficient to establish causality (Covles & Schroeder, 2015). The results of this study demonstrates correlation between HIL and HI, however correlation is often considered weaker than causation and that correlation is not sufficient to derive casual law (Covles & Schroeder, 2015). The simple correlation does not provide evidence of causation and may cause misinforming in practice or impede future research (Conn, 2017).

Recommendations

The utilization of secondary dataset, HRMS, provided access to data directly related to HIL. The HRMS consisted of questions pertaining to “insurance coverage, access to health care, use of health care, health care affordability, and self-reported health status” among adults in the U.S. between the ages of 18 and 64 (Urban Institute, 2016a). Data that was available and not analyzed in this study could, be consider for future studies exploring HIL relationships included: self-reported health status, affordability of care, health care provider selection based on factors level of importance, and provider judgement or unfair treatment received (Holahan & Long, 2017). This study used a quantitative cross-sectional correlation design, which allowed for the testing of the relationships between variables.

Future researchers may consider an alternative method, such as qualitative design using interviews for further interpretation and validation of potential outcomes (Creswell, 2014). Future studies examining HI understanding could provide insight into addressing HI misconceptions, the examination of analogy-based education for HI choices, and provide necessary background information to assist the individual in HI decision making (Politi et al., 2014).

Implications

Consumers are overwhelmed with too many HI choices and lack an understanding of their HI resulting in systematic errors and suboptimal decisions (Lowenstein et al., 2013). The study is one of few that used national data that demonstrated the correlation that exists between HIL with HI enrollment and satisfaction. This study is relevant to

U.S. adults between the ages of 18 to 64 who have low levels of HIL, lack HI and have low levels of satisfaction with their HI. The research examined in this study demonstrated that individuals who have high HIL levels enroll in HI and are satisfied with their HI. The significance of this study is its contribution to the body of knowledge centered around HIL and its impact on the nonelderly adult's HI enrollment and HI satisfaction in the United States. In addition, this study is important for future practical and policy changes, as well as to assist with targeting individuals with lower HIL. The implications for social change in this study potentially impact individual/family, organizational/practice, and societal/policy levels.

HIL level impacts the individual/family's financial understanding and health implications. Those with a decreased level of confidence make suboptimal HI enrollment decisions and lack an acceptable level of satisfaction with HI. An increased level of HIL creates enhanced health outcomes, improved health care insurance usage, and reduction in medical expenses. Strongly linked to satisfaction are patient health outcomes based on the delivery of health care services, informed patients with high levels of information access, and patient proactivity leading the characteristics to securing a lasting relationship with the consumer (Fullerton & McCullough, 2014).

HIL impacts organizational/practices by reducing organizational expenses and bad-debt write-offs. Suggestions for improved HIL may require face-to-face counseling, tools to simulate real-life scenarios, and the stressed importance of utilizing health plan member services for support post-enrollment (Paez & Mallery, 2014). There is a strong recommendation for educators to develop curriculum that is research-based to address

HIL for consumers while evaluating the level of consumer optimal decision making because of the ACA implementation (Kim et al., 2013). Consumer friendly tools for the support of HI plan decision making, care accessibility, and treatment selection could be beneficial to low-income adults, however, these resources have recently declined (Shartz et al., 2016). Consumers' literacy and numeracy abilities have affected the health care delivery system, the payer, and consumers themselves when suboptimal decisions are made regarding HI (Greene et al., 2008).

HIL impacts societal/policy through increased HI usage that is aligned with healthcare reform requirements. Health care policy improvements may lead to increased levels of HIL by eliminating barriers to enrollment and strengthening HI satisfaction among insured individuals. This study identifies a greater need for improving consumer capabilities beyond current consumer-counseling efforts, utilizing developed curriculum, and strategizing outreach attempts (Brown, et al., 2016; Paez & Mallery, 2014; Politi et al., 2014). Low literacy levels create an estimated \$106 to \$238 billion annual economic impact in the United States (Almander-Douglas, 2013). Developmental of a simple HI product, provided plan requirements that offer identical features for ease in comparison, and a cost-neutral simplified insurance product that meets consumer appeal (Loewenstein et al., 2014). Those who provide information to the consumer must influence comprehension through deliberately developed frameworks containing essential information and further their efforts through future development and testing of their presentation approaches (Greene et al., 2008).

Conclusion

Nine out of 10 adults in the United States do not have the skills needed to manage their health and prevention, which contributes to a lack of understanding basic HI terms, subsidies eligibility, health plan selection, and how to use HI (Parragh & Okrent, 2015). Low-to-moderate levels of health literacy create challenges for individuals when making HI purchasing decisions creating mismatches for insurance needs and proper utilization (Kim et al. 2013).

The purpose of this quantitative study was to address the existing gap in the literature regarding the exploration of the relationship between HIL, individuals' HI enrollment and individuals' satisfaction with their HI. There is limited research on the relationship between HIL and the individual's HI enrollment and satisfaction with HI (Lowenstein et al., 2013; Kim et al., 2013; Stern, 2015). The study is one of few that examines the relationship that exists between HIL and HI enrollment, and HIL and satisfaction with HI. The topic of HIL has been researched, however, prior studies were limited to focusing on understanding HI terminology, where respondents gather information when seeking HI, understanding consumers' misunderstanding, and determinants of coverage decisions (Barnes et al., 2015; Loewenstein, et al., 201; Long et al., 2014; Politi et al., 2014).

Binary logistic regression analysis tested hypotheses of four predictive relationships between (a) HI enrollment and HIL with HI terms; (b) marketplace enrollment and HIL with HI terms; (c) satisfaction with HI and HIL with HI access to care; and (d) satisfaction with HI and HIL with HI cost of care. Results indicated that

high HIL participants with HI terms had 4.2 times higher odds than those with low HIL to be enrolled in HI and 81% higher odds than those with low HIL to be enrolled in marketplace HI. The most significant relationship indicated high HIL with HI activities was associated with 12.8 times higher odds than those with low HIL to have high satisfaction with access to care and 8.8 times higher odds than those with low HIL to have high satisfaction with cost of care.

The results of the regression analyses demonstrate the strong relationship that exists between HIL and enrollment, in addition to the relationship between HIL and satisfaction. Consistent with prior research on HIL and enrollment, this study identified strong relationships for high levels of HIL and enrolling in HI or marketplace enrollment. No prior study has examined the relationship between HIL and satisfaction. The results implicate the higher level of HIL with HI activities the more satisfied the individual is with cost and access to care.

This study is one of few to demonstrate the relationships that exist among HIL, HI enrollment, and satisfaction with access and cost of care. Low HIL has contributed to significant confusion, low HI enrollment, overall poor health, and dissatisfied individuals. Policymakers may have the opportunity to utilize the study results to improve HIL, which might lead to increased HI enrollment and improved satisfaction with HI selection. HIL importance and complexity contribute to decreased levels of HI confidence and less optional decision making, often leading to poor health outcomes. Patient satisfaction is a multidimensional concept that is strongly linked to one's health status, the expenses

associated with medical consumption, and the security of lasting consumer relationships (Bohm, 2013; Fullerton & McCullough, 2014).

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