Published in final edited form as:

Appl Res Qual Life. 2017 June ; 12(2): 289–302. doi:10.1007/s11482-017-9517-8.

The Relationships Among Socio-Demographics, Perceived Health, and Happiness

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Abstract

This article explores the relationships among socio-demographics, perceived health, and happiness in a patient population of 221 adults recruited from 39 primary care practices in Alabama. We also explored whether the relationship between socio-demographics and happiness is mediated by perceived health. The dependent variable, happiness, was dichotomized as happy versus unhappy. Independent variables or correlates of happiness included race (Black or White), age (< 65 vs. 65 and older), gender (male vs. female), perceived income (sufficient vs. insufficient to meet basic needs), health literacy (adequate vs. inadequate), and self-rated health (excellent/very good/good vs. poor/fair). Data were analyzed using generalized linear latent and mixed models to examine the relationship between happiness and its correlates. Our findings suggest that adequate health literacy and better perceived health are associated with an increase in the likelihood of happiness. In addition, the relationship between perceived sufficient income and happiness is mediated by perceived health; whereas, individuals with sufficient income are more likely to have better perceived health, and as a result more likely to be happy. Other individual factors, such as gender, age, and race were not significantly associated with being happy or having higher perceived health in any of the models. Results suggest that policies aimed at increasing health literacy, promoting health, and reducing income disparities may be associated with greater happiness.

Keywords

Happiness; well-being; socio-demographics; perceived health

INTRODUCTION

The concept of happiness, in one form or another, has been a central tenet of our culture dating back to Greek philosophers (Graham, 2008; Nordenfelt, 1993). While happiness lacks a universally accepted definition (Campbell, Converse, & Rodgers, 1976, p. 8; Kövecses, 1991; Veenhoven, 2008), it has been described as an abstract and subjective assessment of one's self or the overall appreciation of one's life-as-a-whole (Diener, 2000; Veenhoven, 2008). In addition, happiness is considered a component of 'subjective well-being' that captures positive hedonic, cognitive or affective states (Campbell *et al.*, 1976), and is often associated with feelings of positive emotion, such as, satisfaction and fulfillment (Diener & Seligman, 2004, p. 1; Ford *et al.*, 2015; Kim-Prieto, Diener, Tamir, Scollon, & Diener, 2005; Kövecses, 1991).

Happiness is often described as the main aim of life and the motivation for individual's quest for personal fulfillment (Schoffham & Barnes, 2011). Happiness is seen as an important goal at a personal and a societal level (Lyubomirsky & Lepper, 1999). Arguments have been made that happiness is the ultimate goal and all other things like economic, health, and social policies should be designed as to maximize it (Angner, Miller, Ray, Saag, & Allison, 2010; Diener & Seligman, 2004, pp. 1–2).

Individual conceptions of happiness are to some extent universal (Pflug, 2009), yet individual, cultural, and societal influences have been found to significantly impact an individual's perceptions of happiness (Bojanowska & Zalewska, 2016; Delle Fave, Wissing, Brdar, Vella-Brodrick, & Freire, 2013; Joshanloo, 2013). Research suggests that factors, such as, self-rated health, literacy, demographics and socioeconomic status can influence an individual's level of happiness (Angner *et al.*, 2010; Davis, 1984; Easterlin, 2001; Graham, 2008; Stevenson & Wolfers, 2008; Yang, 2008).

The purpose of this paper is to explore the relationships among socio-demographics, perceived health, and happiness. In addition, we explore whether the relationship between socio-demographics and happiness is mediated by perceived health. This paper explores these relationships with a patient population recruited from primary care practices in Alabama.

Conceptual Framework

Socio-demographics and Happiness

Research into happiness has found that socio-demographic differences (i.e., gender, age, race, income and education) can impact an individual's level of happiness (Brickman, Coates, & Janoff-Bulman, 1978; Kim-Prieto *et al.*, 2005). According to the stratification theory, cultural and socio-demographic factors are important when assessing happiness (Davis, 1984). Social stratification occurs when people are grouped based on similar attributes, such as, gender or race (Davis, 1984). This social stratification can be universal and tends to persist over time. Social stratification can impact happiness (Yang, 2008). Similarly, the minority stress theory posits that members of a stigmatized minority group may experience chronically high levels of stress due to prejudice and discrimination

(Williams, Yu, Jackson, & Anderson, 1997) and that the higher levels of stress can reduce an individual's well-being and happiness (Chatters, 1988; Schiffrin & Nelson, 2010).

Race is an important socio-demographic variable, that has been associated with health behaviors and well-being, even after controlling for individual and neighborhood factors (Chuang, Cubbin, Ahn, & Winkleby, 2005; Stimpson, Ju, Raji, & Eschbach, 2007). One reason is that different racial groups face different levels of racial and social discrimination. Blacks often have lower levels of employment, housing, health, schooling and financial security, all of which can negatively impact perceptions of well-being, satisfaction and happiness (Postmes & Branscombe, 2002; Seaton & Yip, 2009; Williams *et al.*, 1997). A longitudinal examination from the 1970s to 2008, found a declining but discernable gap between Blacks and Whites in marital happiness, overall happiness, and health status (Coverdill, López, & Petrie, 2011). From 1999 to 2007, the number of Blacks who felt that their circumstances have worsened had doubled (Pew Research Center, 2007).

Age has been found to be correlated with increased happiness (Yang, 2008). As individuals age, they gain more insight, satisfaction and self-esteem from their formative experiences, which in turn, can increase their quality of life and happiness (Gove, Ortega, & Style, 1989). Furthermore, older adults have more realistic expectations and as a result may cope better with life negative events than younger adults (Argyle, 2003). In addition, older adults may experience less stress from work as they move into retirement. There are also other factors that are associated with aging, such as, relative income, marriage, number of children, and religious attendance – that all have been found to strongly affect an individual's sense of well-being (Easterlin, 2003; Ellison, 1991; Kohler, Behrman, & Skytthe, 2005; Waite, 1995).

Gender is a socio-demographic variable that has had inconsistent findings as it relates to happiness and well-being. A meta-analysis of ninety-three studies by Wood, Rhodes, and Whelan (1989) found a small but statistically significant gender difference in happiness, with women happier than men. However, more recent data suggest these gender differences may have disappeared, and potentially may have inverted (Stevenson & Wolfers, 2008).

Income or perceived income is an important factor when examining happiness and well-being (Dyran & Ravina, 2007). This is partially due to the reference-income hypothesis, which suggests that individuals care more about how their income is perceived as others, rather than the absolute level of income that they have (Boyce, Brown, & Moore, 2010). Perceptions of income inadequacy, like other subjective measures, can be a meaningful psychological measure of the financial adequacy, more so than an absolute dollar sum (Sun, Hilgeman, Durkin, Allen, & Burgio, 2009). Money can buy a minimal level of happiness (i.e. not being in poverty) but it is the perception of wealth as compared to others that can have a more substantial impact on happiness (Ball & Chernova, 2008).

Health literacy is the ability, skill and capacity to communicate, process and understand basic health information and make appropriate healthcare decisions (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Koh *et al.*, 2012; Lee, Choi, & Lee, 2015; Ratzan, Parker, Selden, Zorn, & Ratzan, 2000). Literacy has been associated with higher levels of education, better income and improved likelihood of employment (Kutner, Greenberg, Jin,

Boyle, Hsu, & Dunleavy, 2007). Health literacy has been described as “critical to empowerment” for an individual, (Koelen & Lindström, 2005, p. S13; Nutbeam, 2000, p. 259), which may explain the observed positive association between literacy and happiness (Angner *et al.*, 2010).

Perceived Health and Happiness

Happiness and health are intimately connected with an individual’s assessment of ‘well-being’, and have been found to be highly correlated (Graham, 2008). The World Health Organization (WHO) defines health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 1946/1992). Good health is linked to higher happiness levels while major health shocks-such as serious diseases or permanent disabilities, are often found to have negative and lasting effects on happiness (Angner, Ray, Saag, & Allison, 2009; Dolan, 2006; Graham, 2008).

Self-rated health or perceived health is regarded a valid and reliable indicator of health status (Schüz, Wurm, Schöllgen, & Tesch-römer, 2011). Perceived health reflects the individual’s subjective well-being and health-related quality of life with high predictive validity of morbidity and mortality (Halford, Anderzén, & Arnetz, 2003; Mora, Di Bonaventura, Leventhal, & Leventhal, 2008; Rutledge *et al.*, 2010). Research has shown perceived health to be linked to higher levels of happiness (Angner *et al.*, 2009; Graham, 2008; Michalos, Zumbo, & Hubley, 2000).

Socio-Demographics, Perceived Health, and Happiness

Similar to happiness, research has shown that socio-demographic characteristics play a key role in perceived health. Blacks, women, older adults, and lower income individuals have lower self-reported health (Franks, Gold, & Fiscella, 2003). Low literacy has also been associated with self-reported poor health, perhaps because health literacy is fundamental to understanding and accessing health care (Baker, Parker, Williams, Clark, & Nurss, 1997).

Given the expected relationships between socio-demographics and perceived health, and the association between perceived health and happiness, the relationship between socio-demographics and happiness may be mediated by perceived health. That is, socio-demographics may have both a direct association with happiness, and an indirect association with happiness through their relationship with perceived health. Therefore, we hypothesize that socio-demographics are associated with happiness and perceived health, and that perceived health is a mediator between socio-demographics and happiness. These hypothesized relationships are summarized in Figure 1.

Methods

Subjects

This study uses baseline, cross-sectional data from patients participating in a group randomized clinical trial (i.e., the Alabama Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) Patient Safety Study: Disparities in Risk Awareness and Communication Project). The purpose of the intervention was to evaluate the effectiveness of patient storytelling DVD

intervention. The study is described in detail by Miller *et al.*, 2016. Data for this study were collected from March 2011 through November 2011. The study was reviewed and approved by the University of Alabama at Birmingham Institutional Review Board (# X091029002).

Participants were recruited from 41 primary-care physician practices. Eligible patients had to meet the following criteria: (1) being 19 years of age or older; (2) currently taking a prescription NSAIDs or over the counter ibuprofen/naproxen as recommended by their physician; and (3) willing to provide contact information and consent to participate in a telephone interview. Eligible patients completed an approximate 30-minute telephone survey in which demographic and socioeconomic variables, happiness scores, and health indicators were obtained. There were a total of 373 patients that met study eligibility and were reachable by phone. Of those eligible participants, 259 patients consented to complete the baseline telephone survey, for a participation rate of 69%. Data were obtained using computer-assisted telephone interview (CATI) protocols. The data were entered directly into the computer by trained interviewers. All participants who completed the interview received a \$20 gift card. Patients who were not currently taking an NSAID or had missing data on any of the independent and dependent variables were excluded from analysis. The final analytic sample included 221 respondents from 39 practices, which represented a 59% participation rate among those eligible for the study and reachable by phone.

Measures

The dependent variable, happiness, was measured using the Subjective Happiness Scale developed by Lyubomirsky and Lepper (1999), which has been psychometrically validated and used in previous studies (Angner *et al.*, 2010; Angner, Ghandhi, Williams-Purvis, Amante, & Allison, 2013; Lyubomirsky & Lepper, 1999; Lyubomirsky, 2001; Lyubomirsky, King, & Diener, 2005; Lyubomirsky, Tkach, & DiMatteo, 2006). The Subjective Happiness Scale was originally formulated as a written questionnaire but was modified for telephone administration (Angner *et al.*, 2010, 2013). For example, first-person statements (“I consider myself”) in the written questionnaire were modified to second-person questions (“do you consider yourself”). In addition, the term “most people” was used instead of “most of my peers”, since it was considered more appropriate from a literacy standpoint. The revised questions, as they were read to participants, are available in Appendix A. Respondents were asked to provide a rating from 1–7, with the anchor choices varying by question. For item 1: 1= you do not consider yourself to be a very happy person, and 7= you consider yourself to be a very happy person. For item 2: 1= you are less happy than most people, and 7= you are more happy than most people. For items 3 and 4: 1= statement does not describe you at all, and 7= statement describes you a great deal. The total happiness score was computed as the average of the four answers (with the last question reverse scored). If there was a missing answer to one of the four happiness questions, the average score was computed from the remaining three answers. If two or more of the four happiness items were missing, the scale was coded as missing. A Cronbach Alpha of 0.90 was established for the items, which reached conventional standards for scale internal consistency reliability (Cortina, 1993). To handle skewness and consistent with prior research (Angner *et al.*, 2010, 2013), the happiness index score was dichotomized at the lowest quartile (< 4.5); with scores above 4.5 representing being happy, while scores of 4.5 or lower indicating being unhappy. Other

strategies for dichotomizing, such as the median value, provided substantially uneven cut points on the happiness scale.

The independent variables included race, age, gender, having sufficient income, adequate health literacy, and perceived health (self-rated health). All the independent variables were coded as binary as to handle skewness of the data (DeCoster, Iselin, & Gallucci, 2009). This approach is consistent with previously published work and ensures sufficient categorical representation in multivariable analysis (Agner *et al.*, 2010; Miller, Schmitt, Allison, Coughlin, Ray, & Saag, 2010). Race was dichotomized as Black or White. Hispanic (n=1) was removed from the analysis, given the limited sample of respondents reporting.

Age was dichotomized based on whether the participant was 65 years or older, or less than 65 years old, at the time of the interview. This commonly used cutoff point was used because it historically represents the transition from working age to retirement age. Gender was dichotomized to represent male and female.

Having sufficient income represents whether or not the respondent considered their income as sufficient to meet the basic needs for food, housing, clothing, and medical care. This variable captures the subjective but meaningful measure of income sufficiency (Chan, Ofstedal, & Hermalin, 2002; Sun *et al.*, 2009). This measure reduces some risk of using an absolute dollar amount, as individuals may unknowingly omit sources of income, resulting in a biased or inaccurate measure. A quantitative measure of poverty status using questions related to household size and reported income was created. This definition was derived from the 2007 California Health Interview Survey (CHIS) and the four-level categorical variable allocated subjects to “At or Below 100% FPL”, “Above 100% FPL but at or Below 200% FPL”, “Above 200% FPL but at or Below 300% FPL”, and “Above 300% FPL”. In constructing this measure, 18 cases were lost to missing data. Some cells for this quantitative measure were sparsely populated when cross-tabulated with the happiness. Moreover, the bivariate association between these two variables was weaker than the subjective measure of income sufficiency. Therefore, the subjective measure of income sufficiency was retained. The subjective measure of income sufficiency was consistent with past work (Miller *et al.*, 2010a).

Health literacy was measured using a single-item screening question: “How confident are you in filling out medical forms by yourself?” (Chew, Bradley, & Boyko, 2004; Chew *et al.*, 2008; Wallace, Rogers, Roskos, Holiday, & Weiss, 2006; Wallace *et al.*, 2007). Participants who responded with “not at all”, “a little bit”, or “somewhat” were classified as having inadequate health literacy, while those indicating “quite a bit” or “extremely” were classified as having adequate health literacy. This cut-point has been demonstrated as best in balancing sensitivity and specificity when compared to the Short Test of Functional Health Literacy in Adults (S-TOFHLA) and the Rapid Estimate of Adult Literacy in Medicine (REALM) (Chew *et al.*, 2004, 2008; Wallace *et al.*, 2006, 2007).

Perceived health (self-rated health) was assessed with the question: “In general, would you say your health is: excellent, very good, good, fair, or poor?” (Stewart, Hays, & Ware, 1988). When analyzing the responses, participants were classified as having “excellent/very good/

good” or “poor/fair” self-rated health. The dichotomous variable for perceived health has been frequently used in prior health studies (e.g. Pietiläinen, Laaksonen, Rahkonen, & Lahelma, 2011; Stenholm *et al.*, 2014; Tucker-Seeley, Harley, Stoddard, & Sorensen, 2013); and research has shown that analyses based on the dichotomous variable yield similar results to those of the ordered categorical variable (Manor, Matthews, & Power, 2000)

Statistical Analysis

Chi-square tests were used to assess the bivariate relationships among socio-demographics, perceived health, and happiness. To explore the relationships among socio-demographic, perceived health, and happiness, and test potential mediation of perceived health, we followed Baron and Kenny’s approach (1986) and estimated three models examining the relationships between: 1) Socio-demographics and happiness; 2) Socio-demographics and perceived health; 3) Perceived health and happiness after controlling for socio-demographics. Generalized linear latent and mixed models (GLMM) with logit link were used to model the above relationships. This approach was able to account for patients being nested within physician practices. The level of statistical significance was set at $\alpha = 0.05$. All analyses performed using Stata 14.1 for Windows.

Results

Table 1 shows the descriptive statistics for the independent variables by happiness. Happy individuals were characterized as having sufficient income, adequate health literacy, and good to excellent perceived health. Race, age and gender did not differentiate significantly between happy and unhappy individuals. Table 2 shows the results of the multi-level logit regression for the three models.

Socio-Demographics and Happiness (Model 1)

Adequate health literacy (OR = 2.86; 95% CI = 1.25–6.51) and sufficient income (OR = 2.43; 95% CI = 1.17–5.06) were associated with increased odds of happiness. However, gender, age and race were not significantly associated with happiness.

Socio-Demographics and Perceived Health (Model 2)

Sufficient income was associated with increased odds of good to excellent perceived health (OR = 2.33; 95% CI = 1.21–4.48). However, gender, age, race and health literacy were not significantly associated with perceived health.

Socio-Demographics, Perceived Health, and Happiness (Model 3)

Good to excellent perceived health increased the odds of happiness (OR = 6.68; 95% CI = 3.13–14.29). After controlling for perceived health, having sufficient income was not significantly associated with happiness. This suggests that the relationships between income and happiness is mediated through perceived health. Adequate health literacy (OR = 2.38, 95% CI = 0.98–5.77) remained a relatively strong correlate of happiness even after controlling for perceived health. Other socio-demographic variables such as race, gender, and age remained not significantly associated with happiness.

Discussion/Conclusion

The goal of this study was to examine the relationships among socio-demographics, perceived health, and happiness in a diverse patient sample in Alabama. We hypothesized that socio-demographics, such as race, age, gender, income, and health literacy are associated with both happiness and perceived health, and that perceived health may be a mediator between socio-demographics and happiness. Our findings suggest that individuals with adequate health literacy are more likely to be happy. In addition, individuals with better perceived health are more likely to be happy. Furthermore, the relationship between perceived sufficient income and happiness is mediated by perceived health; that is, individuals with sufficient income are more likely to have better perceived health, and as a result more likely to be happy. Other individual factors including gender, age, and race were not significantly associated with being happy or having higher perceived health in any of the models.

Adequate health literacy remained a relatively strong correlate of happiness even after controlling for perceived health. A prior study found health literacy to be associated with happiness in a patient population in Alabama (Angner *et al.*, 2010). Our measure of health literacy relates to confidence in completing medical forms, and as such, may be related to self-efficacy. Health literacy skills can empower individuals to act, and as a result, improve their self-efficacy or perceived confidence. Similarly, health literacy may be associated with an internal locus of control, i.e. the belief that one can influence events and outcomes (Angner *et al.*, 2010). As such, individuals who have higher levels of health literacy may feel in control over their situation resulting in higher levels of happiness (Pannells & Claxton, 2008). This suggests that policies aimed at increasing health literacy may increase happiness potentially through greater feelings of personal empowerment.

We also found that individuals who had better perceived health were more likely to be happy, even after controlling for socio-demographics. The observed relationship between self-rated health and happiness is consistent with prior research. (Angner *et al.*, 2009; Dolan, 2006; Graham, 2008). One potential mechanism is the effect that poor health may have on social capital through lower levels of social connectedness/engagement. Social capital defined as the “strength of family, neighborhood, religious, and community ties”, has been associated with happiness and well-being (Helliwell & Putnam, 2004, p. 1435; Pinquart & Sörensen, 2000; Yip *et al.*, 2007). Prior research shows that that physical functional limitations can result in “disengagement” or decline in the both number and level of physical and social activities, with implications for social capital and well-being (Atchley, 1998). As such policies that promote health or address the potential negative effects of poor health may result in greater happiness (Yip *et al.*, 2007).

We note significant racial disparities in self-rated health in our study sample, with 46% of Blacks rating their health as poor/fair, but only 26% of Whites having similar ratings. As such, policies addressing the potential deleterious effects of poor health or promoting better health may have a greater impact among Blacks, with the potential to reduce health disparities.

Finally, we found that the relationship between perceived income and happiness was mediated by perceived health; individuals with perceived sufficient income were more likely to be happier as a result of better perceived health. Money can buy a minimal level of happiness (Ball & Chernova, 2008). On the other hand, individuals with insufficient income may have worse health status, or having worse health status may reduce income. Individuals who feel as if they have sufficient income may have less financial stressors or worries (i.e. poverty or financial distress). Lack of these stressors may increase an individual's perception of health. Prior research has shown a relationship between stress and self-rated health (Halford, Anderzen, & Ametz, 2003). Policies aimed at reducing income disparities may improve perceived health as a result of lower stress, and better perceived health may result in happier individuals.

It is noteworthy, that there were significant perceived income disparities in our sample, with 62% of Blacks indicating their income was not sufficient to meet basic needs compared to 28% of Whites. Therefore, policies that address income disparities may be particularly relevant in addressing racial disparities in health and happiness.

There are several limitations of this study. First, the cross-sectional design of the study does not allow us to establish causality. For example, the observed relationship between self-rated health and happiness may be endogenous. Personality traits or other unobservable variables may be linked to both better health and higher happiness levels. In addition, the relationship between happiness and perceived health may be bidirectional. Second, there is potential selection bias in that study participants may not be representative of the patient population. For example, males represented only 26% of the sample. Since patients were recruited through exit cards at their physician offices, this lower representation may be a result of both lower physician utilization and lower willingness to participate in research studies among males. Third, our study was limited to respondents in the state of Alabama, with a majority of them being Black or White. This limits the generalizability of the study findings to other racial/ethnic groups. Future studies should examine the relationship between race/ethnicity and happiness among more diverse populations. Fourth, patients participating in this study were individuals with an NSAIDs prescription. As such, this population is likely to be characterized as a population with chronic pain, and its characteristics may influence the observed relationships in this study. Fifth, our health literacy measure was limited to one item focused on confidence in completing medical forms. Future studies, should examine the relationship between literacy and happiness using more comprehensive assessments of literacy, such as the S-TOFHLA and the REALM. Lastly, the sample size is relatively small which may have affected the ability to detect statistical significance among the studied relationships.

Despite its limitations, this study makes an important contribution to the literature on the examination of the relationships among socio-demographics, perceived health, and happiness. While self-rated health is an important factor of happiness so is health literacy and perceived income. Other socio-demographics, such as gender, age and race were not significant factors of happiness. Policies aimed at reducing the potential negative effects of poor self-rated health, low literacy and financial stress may result in greater well-being in the population and potentially lower disparities.

Acknowledgments

This project was supported in part by the AHRQ Deep South Musculoskeletal Center for Education and Research in Therapeutics (DSM CERTs) [U19 HS021110-01]. Robert Weech-Maldonado was supported in part by the NIA Deep South Resource Center on Minority Aging (RCMAR) [P30AG031054]. The sponsors did not review the manuscript.

Appendix A

Modified Happiness Items

1. How happy do you consider yourself to be in general? 1 means that you do not consider yourself to be a very happy person and 7 means that you consider yourself to be a happy person.
2. How do you compare your happiness to that of other people? 1 means that you are less happy than most people and 7 means that you are more happy than most people.
3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. How well does this describe you? 1 means that the statement does not describe you at all and 7 means that it describes you a great deal.
4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. How well does this describe you? 1 means that the statement does not describe you at all and 7 means that it describes you a great deal.

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Figure 1.
Conceptual Framework

Table 1

Independent Variables by Happiness

Independent Variables	Happy n (%)	Unhappy n (%)	Chi-square p-values
<i>Race</i>	<i>163</i>	<i>56</i>	<i>0.06</i>
White	99 (61%)	26 (46%)	
Black	64 (39%)	30 (54%)	
<i>Age</i>	<i>164</i>	<i>57</i>	<i>0.19</i>
Less than 65	121 (74%)	47 (82%)	
65 or Older	43 (26%)	10 (18%)	
<i>Gender</i>	<i>164</i>	<i>57</i>	<i>0.34</i>
Female	119 (73%)	45 (79%)	
Male	45 (27%)	12 (21%)	
<i>Income</i>	<i>162</i>	<i>57</i>	<i>0.001***</i>
Not Sufficient	58 (36%)	36 (63%)	
Sufficient	104 (64%)	21 (37%)	
<i>Health Literacy</i>	<i>164</i>	<i>57</i>	<i>0.01**</i>
Inadequate	26 (16%)	20 (35%)	
Adequate	138 (84%)	37 (65%)	
<i>Perceived Health</i>	<i>164</i>	<i>57</i>	<i>0.001***</i>
Poor/Fair	37 (23%)	39 (68%)	
Excellent/Very Good/Good	127 (77%)	18 (32%)	

*
p 0.05,

**
p 0.01,

p 0.001

Table 2
Multi-Level Logistic Regression: Socio-Demographics, Perceived Health, and Happiness

	Model 1: Socio-demographics and Happiness		Model 2: Socio-demographics and Perceived Health		Model 3: Socio-demographics, Perceived Health, and Happiness	
	Odds (95% CI)	P-values	Odds (95% CI)	P-values	Odds (95% CI)	P-values
Black Race	0.89 (0.41–1.94)	0.78	0.54 (0.28–1.03)	0.06	1.14 (0.51–2.59)	0.75
Age 65 Years	1.99 (0.83–4.78)	0.12	1.25 (0.61–2.56)	0.55	1.90 (0.76–4.75)	0.17
Male	1.26 (0.53–3.00)	0.60	0.73 (0.35–1.52)	0.40	1.56 (0.62–3.92)	0.35
Sufficient Income	2.43 (1.17–5.06)	0.02 *	2.33 (1.21–4.48)	0.02 *	1.89 (0.86–4.19)	0.12
Adequate Health Literacy	2.86 (1.25–6.51)	0.02 *	1.98 (0.94–4.17)	0.07	2.38 (0.98–5.77)	0.055 *
Good to Excellent Perceived Health					6.68 (3.13–14.29)	0.001 ***
Constant	0.75 (0.29–1.93)		0.95 (0.42–2.18)		0.29 (0.10–0.86)	

* p < 0.05,

** p < 0.01,

*** p < 0.001