

# The Relation Between Educational Attainment and Physical Quality of Life: A Comparison Between Latinxs and Whites

Amber Quinlan and Jasmine Mena, Ph.D.  
Bucknell University

**Abstract** This study examined the relation between educational attainment and self-reported physical health quality of life (QOL) in a population of Latinx and non-Latinx White participants. It was expected that ethnicity would moderate the relation between educational attainment and physical QOL where Latinxs with higher levels of education would report lower physical QOL than Whites. The sample included  $N=137$  adults who were recruited from two health centers in Rhode Island. Participants completed a survey that assessed QOL and use of health resources. In addition, known moderators of physical health were considered in the primary analyses (e.g., currently ill, employment status, and psychological quality of life). Higher levels of educational attainment were associated with higher physical QOL with ethnoracial groups in aggregate. Examination of within-group differences indicated that Whites with higher educational attainment had better physical QOL than Whites with lower educational attainment; a pattern that was not observed with Latinxs. A hierarchical multiple regression indicated that psychological QOL, employment status, and current illness were significant predictors of physical QOL and that the relation between educational attainment and physical QOL was not moderated by ethnoracial identity. These findings suggest that higher educational attainment provides varying benefits to Latinxs and Whites. However, to effectively address the health of diverse racial/ethnic groups, further research is needed to discern how other factors might contribute to their health.

**Index Terms**— *Physical Health, Quality of Life, Latino/Hispanic, Education*

## INTRODUCTION

The Latinx population in the United States continues to grow, and it is predicted that by the year 2044, over half of the total U.S. population will belong to a group other than the non-Latinx White group (Colby & Ortman, 2015). Culture and context influence health. Thus, it is important to know if Latinxs have similar health-related experiences compared to Whites and, if differences are detected, to understand the reasons why. An analysis of over 40,000 individuals who completed the California Health Survey indicated that Latinx participants were significantly more likely to report fair or poor health, and older Latinxs were more likely to report chronic conditions and difficulty during daily activities compared to non-Latinx Whites. In addition, Latinxs were the group least likely to be continuously insured and to have been to a doctor in the past year at the time of survey completion (August & Sorkin, 2010).

Although some data on the physical health of the U.S. Latinx population are available, the studies are “largely

epidemiological and limited to prevalence and incidence rates for major causes of illness and disease and established risk factors” (Ruiz, Campos, & Garcia, 2016, p. 62). This emphasizes the need for research on Latinx physical health, including related factors that may drive health disparities. It is important to better understand the factors that are linked to health quality within and across racial/ethnic groups for the purposes of identifying and reducing health disparities. In this study, physical quality of life was explored as a function of educational attainment and other factors in a sample of Latinxs and non-Latinx Whites.

## Ethnic Differences and Physical Quality of Life

Quality of life (QOL) is defined by the World Health Organization (1997) as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns” (p. 1). The physical QOL domain of their WHOQOL-BREF questionnaire includes topics such as sleep, daily activities, mobility, pain, use of medicinal substances and medical aides, energy and fatigue, and work capacity to determine an individual’s

Manuscript received August 2020; resubmitted and accepted August 2021.

Amber is a recent graduate of Bucknell University. She received a Bachelor of Arts with a major in Psychology and a minor in Education. During her time at Bucknell, Amber participated in several research projects on campus within the Multicultural Health Psychology Lab and Education Department, focused on Latinx health and multicultural educational methods. Her primary research interests include minority health, health disparities, and provider cultural competence. Correspondence concerning this article should be addressed to Amber Quinlan, 2917 Hollins Ferry Road, Baltimore, MD, 21230. Email: anq001@bucknell.edu.



physical QOL score. Physical QOL is influenced by numerous variables (e.g., age, healthy diet, exercise, and frequent check-ups with doctors, etc.). Race and ethnic group membership also significantly impact physical QOL.

There have been many studies that observed lower physical QOL ratings for Latinx participants compared to ratings of non-Latinx White participants (August & Sorkin, 2010; Borrell & Dallo, 2008; McGarry, Temkin-Greener, & Li, 2014). Some scholars have also observed that Whites are more likely than Latinxs to have long-term care insurance as seniors (McGarry et al., 2014). Such that, Whites are able to take better care of chronic issues than their Latinx counterparts. These differences could be due to the varying levels of access to healthcare resources as well as disparities in the following: finances, insurance, transportation, flexible work schedules, childcare, and mistrust of medical staff. These disparities leave the disadvantaged groups at risk for negative health outcomes.

In spite of the disparities, there is evidence to suggest that having a strong ethnic identity can reduce discrimination stress, and ultimately can act as a buffer between QOL and disparities (Mossakowski, 2003). The Immigrant Health Paradox or Latino Health Paradox (Turner & Lloyd, 2004) is a phenomenon whereby Latinxs report better health outcomes compared to non-Latinx Whites despite various health disparities and social disadvantages. Antecol and Bedard (2006) observed that, on average, both male and female immigrants come to the U.S. with BMIs that are lower, and within the healthier range, compared to the BMIs of those born in the U.S. They also found that, after some years in the U.S., the BMIs of migrants increased to match those of native-born individuals. The idea of acculturation is not new to the field, but it is apparent that acculturation is a factor that could have an impact on QOL ratings in that as migrants are exposed to and adjust to values and habits of native-born groups and, over time, their health declines. Additional evidence for the Immigrant Paradox includes the following findings: Latinx men are less likely to report injuries than White men (Berdahl & Zodet, 2010); more White participants reported major declines in health compared to Latinx participants (Sudano & Baker, 2006); and, in communities with high percentages of foreign-born residents, there were lower rates of asthma and other breathing problems (Cagney, Browning, & Wallace, 2007). The goal of the current study was to examine the self-reported physical health quality of life for non-Latinx Whites and Latinxs.

### Socioeconomic Differences, Education, and Physical QOL

Physical QOL is impacted, in part, by variables that include but are not limited to the following: physical health, age, diet, and socioeconomic status (SES). Socioeconomic factors such as income level, employment status, education, insurability, and insurance coverage are of particular importance here. Insurance allows individuals to have access to various medical services and to alleviate the stress and financial burden of treatments or medications. Latinxs are less likely to have insurance or jobs that provide insurance benefits (Baker, Sudano, Albert & Dor, 2001; Kirby & Kaneda, 2013). Further, in some instances, Latinxs face language barriers and related biases in seeking services (Doty, Blumenthal, & Collins, 2014). These are examples of *double jeopardy*, which involves simultaneously experiencing multiple social disadvantages, such as being uninsured while also having poorer health (Kirby & Kaneda, 2013).

Education level plays a large role throughout life and it is correlated with SES, access to insurance, and health (Goldman & Smith, 2011; Ma, Pender, & Welch 2019). In a study conducted by Delpierre and colleagues (2009), male and female participants with lower educational attainment had lower self-reported scores of physical health (SRH). They also observed that people with lower educational attainment were more likely to suffer from different functional limitations and health conditions such as cardiovascular disease, eye problems, and oral health problems compared to people with higher educational attainment. In another study that focused on work-related injuries, workers with higher educational attainment were less likely to suffer work-related injuries compared to those with lower educational attainment (Berdahl & Zodet, 2010). The goal of this study was to examine the role of educational attainment in the self-reported physical health quality of life for non-Latinx Whites and Latinxs.

### The Current Study

Based on the literature review that was conducted, we hypothesized that (1) higher educational attainment would be positively related to physical health quality for the combined sample (aggregating non-Latinx Whites and Latinxs). To address possible within-group differences, we hypothesized that (2) Whites with higher educational attainment would report higher health quality than Whites with lower educational attainment. Similarly, we hypothesized that (3) Latinxs with higher educational attainment would report higher health quality than Latinxs with lower educational attainment.

However, it is still unclear of what impact other factors, such as ethnicity, have on this relationship. Limited research has been conducted that examines the relationship between educational attainment and health quality moderated by ethnicity, especially in regard to non-Latinx Whites and Latinx individuals. In a study conducted using

data from the National Health Interview Survey, researchers found that Hispanics had a higher prevalence rate for self-reporting fair or poor health (Borrell & Dallo, 2008). However, the Latino/Immigrant Health Paradox suggests that Latinx individuals sometimes have better physical health compared to Whites despite social disadvantages (Ruiz et al. 2016). In light of the conflicting research and given the stress of social disadvantages, we hypothesized that (4) Whites would report, on average, higher health quality than Latinx participants and that (5) Whites with low educational attainment would report higher health quality than Latinxs with higher educational attainment. Finally, we hypothesized that (6) the health advantage held by non-Latinx Whites due to social status would hold after considering the effect of various demographic and socioeconomic variables.

**METHODOLOGY**

**Participants**

Participants were 137 adults (26.3% male, 73.7% female) between the ages of 21 and 83. The mean age of participants was 42.9 years old (*SD* = 17.14). Participants self-identified as Latinx (*n* = 65, 43.6%) or non-Latinx White (*n* = 72, 48.3%). Most of the participants indicated that they were heterosexual (*n* = 122, 92.4%). With respect to relationship status, the largest proportion of participants indicated that they were married (*n* = 53, 39%), while the smallest proportion indicated being widowed (*n* = 7, 5.1%). Participants also identified their employment status with the percentage of White and Latinx participants who reported being employed full-time nearly identical (26.4% & 26.2% respectively). However, the percent of participants who were unemployed, but looking, was greater among Latinx (*n* = 18, 27.7%) participants than Whites (*n* = 10, 13.9%). The majority of the participants reported that they were not currently ill (*n* = 94, 69.1%). Additional participant characteristics are presented in Table 1.

**Procedures**

This study is a secondary data analysis. The procedures described below were employed in the original study. After institutional review board approval was obtained, participants were recruited by the principal investigator, a graduate student, and an undergraduate research assistant. Participants were approached in person at one of two federally qualified health centers. One health center was located in a geographically rural community and the other in an urban setting. Participants were told that the study was about the behavioral health needs of adults in the community. Participants provided consent to anonymously provide demographic information and complete the 20-minute self-administered survey. Participants were given the option of completing the survey in their preferred

language of either English or Spanish.

Table 1. Participant Characteristics and Study Variables

	Non-Latinx White ( <i>n</i> = 72)		Latinx ( <i>n</i> = 65)		Total ( <i>n</i> = 137)	
	%	%	%	%	%	%
Data Collection Site						
Rural	93.1		4.6		51.1	
Urban	6.9		95.4		48.9	
Gender						
Male	29.2		23.1		26.3	
Female	70.8		76.9		73.7	
Sexual Orientation						
Heterosexual	88.9		89.2		92.4	
Gay or Lesbian	1.4		0		0.8	
Bisexual	6.9		1.5		4.5	
Other	1.4		3.1		2.3	
Relationship Status						
Single	15.3		33.8		24.3	
In a relationship	26.4		23.1		25	
Married/Civil Union/Domestic Partners	43.1		33.8		39	
Divorced/Separated	8.3		4.6		6.6	
Widowed	6.9		3.1		5.1	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (21-83)	47.79	17.8	37.21	14.56	42.9	17.14
Education (1-5)	3.44	3.44	2.75	.94	3.12	.94
Physical Health (4-20)	14.4	3.33	13.08	3.23	13.76	3.34
Psychological Health (4-20)	14.1	3.25	13.79	3.29	13.96	3.29

Participants received a \$10 recruitment incentive in cash. In order to prevent coercion, participants were informed that the monetary incentive was for recruitment purposes and not contingent upon completion of the survey. Through the informed consent process the researchers emphasized that individuals could end their participation at any time with no penalty. That said, all participants who started the survey completed it.

**Measures**

Various measures were completed as part of the larger study including: A survey of behavioral service utilization (e.g., psychiatry, therapist, social worker, etc.), medical mistrust, mental illness stigma, provider cultural competence expectations and demographic characteristics. The following measures were used in the current study.

**Demographics.** Participants were asked to provide information about their ethnic and racial identity, age, gender, employment status, and relationship status.

**Educational Attainment.** Participants were asked to identify their highest level of education. They were given five options to choose from which included: 8th Grade or less, some High School, High School Diploma or GED, College Degree, and Graduate Degree. Higher values reflect higher levels of educational attainment.

**Physical Quality of Life.** The World Health Organization Quality of Life – Brief Version was used in this study (WHOQOL - BREF; Harper & Power, 1998). Specifically, Domain 1: Physical Health of the WHOQOL-BREF was the dependent variable in this study. This domain included seven questions that addressed physical quality of life on a 5-point Likert scale. Participants were asked to respond to questions such as, “To what extent do



you feel that physical pain prevents you from doing what you need to do?” and “Do you have enough energy for everyday life?”. Domain 2, psychological health, was also included as a covariate in the current study. This subscale included six items. Sample questions included “To what extent do you feel your life to be meaningful” and “How often do you have negative feelings such as blue mood, despair, anxiety, depression?”. Negatively worded items in both scales were reverse scored before obtaining averages for each domain.

As recommended by the developers, responses were multiplied by four in order to make the domain scores comparable with the scores in the WHOQOL-100. As such, in this study the QOL domain scores range from 4 to 20 and higher scores represent better quality of life. Validation for the WHOQOL-BREF has been established in English and Spanish with diverse populations and has demonstrated satisfactory psychometric properties including convergent, discriminant, and criterion validity and good internal consistency of the scale (Lucas-Carrasco, 2012; Saxena, Carlson, Billington, & Orley, 2001). For this study, internal consistency for the physical health subscale was very good for Latinxs ( $\alpha = .87$ ) and Whites ( $\alpha = .87$ ).

## RESULTS

### Preliminary Analyses

Means and standard deviations for the study variables are presented in Table 2. Independent-samples t-tests were conducted to compare group differences in the study’s continuous variables. The Bonferroni method was used to correct for the family-wise error rate. There were no significant differences in the study variables between males

Table 2. Independent Samples T-test Examining Differences by Geography and Gender

	Recruitment Site Geography					Gender				
	Rural		Urban		t	Male		Female		t
	M	SD	M	SD		M	SD	M	SD	
Age	48.24	17.96	37.05	14.13	4.03***	44.75	17.60	42.21	17.00	.76
Education	3.49	.83	2.73	.90	5.11***	3.44	.88	3.0	.94	2.48
Physical QOL	14.48	3.39	13.04	3.14	2.25	14.43	3.31	13.54	3.33	1.37
Psych QOL	14.35	3.25	13.51	3.31	1.43	14.60	3.62	13.71	3.14	1.37

Note.  $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ . The Bonferroni correction was applied to correct for the family-wise error rate resulting in a revised threshold of statistical significance of  $p < .006$ .

and females. There were significant differences between the rural and urban recruitment site locations suggesting that those in the rural region were older in age,  $t(129) = 4$ ,  $p <$

.001, and had higher educational attainment,  $t(135) = 5.11$ ,  $p < .001$ .

Bivariate correlations were also calculated to analyze the relationship between age, educational attainment, physical health QOL, and psychological health QOL (See Table 3). Results revealed a moderate, positive relationship between physical health QOL ratings and psychological health QOL ratings,  $r = .693$ ,  $n = 125$ ,  $p < .001$ . The results also indicated that educational attainment and physical QOL were significantly related in the aggregated sample,  $r = .42$ ,  $n = 132$ ,  $p < .001$  (Hypothesis 1).

Table 3. Bivariate Correlations

	1	2	3
1. Age			
2. Education	.03		
3. Physical QOL	-0.11	.42**	
4. Psychological QOL	0.07	.32**	.693***

Note.  $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ .

### Primary Analyses

**Educational attainment and physical QOL within groups.** Two hierarchical multiple regression analyses were conducted to test the hypotheses that Whites and Latinxs with higher educational attainment would report better physical QOL than Whites and Latinxs with lower levels, respectively while controlling for the effect of recruitment site. The file was split by race/ethnicity for these analyses. For each test, recruitment site was entered in step 1 and educational attainment in step 2. For Whites, recruitment site ( $\beta = -1.24$ ,  $p = .43$ ) did not yield significance, but educational attainment did (added in step 2;  $\beta = 1.99$ ,  $p < .001$ ) which suggested that, for Whites, higher educational attainment was associated with higher physical QOL scores (Hypothesis 2). However, for Latinxs, the omnibus test indicated that neither model (step 1 and step 2) yielded statistical significance, as such, no further interpretation of the predictors was possible. These results suggest that that the relationship between educational attainment and physical QOL is dissimilar for these groups (Table 4).

**Predictors of physical QOL and the moderation effect of race/ethnicity.** A hierarchical multiple regression approach as proposed by Aiken and West (1991) was used to analyze the relationship between educational attainment and physical QOL and to test the moderation effect of race/ethnicity on the relationship between educational

attainment and physical QOL while considering the role of various factors that are known to influence health. The following variables were entered in step 1: gender ( $\beta = -.49, p = .30$ ), psychological health ( $\beta = .67, p < .001$ ), age ( $\beta = -.04, p = .003$ ) and recruitment site ( $\beta = -1.24, p = .007$ ) and each made a significant contribution to physical QOL except gender. In Step 2, the centered version of the educational attainment variable was added along with the race/ethnicity variable.

Table 4. Hierarchical Regression Analysis for the Influence of Educational Attainment on Physical QOL by Race/Ethnicity

	Non-Latinx Whites						Latinx					
	Model 1			Model 2			Model 1			Model 2		
	B	SE	Beta	B	SE	Beta	B	SE	Beta	B	SE	Beta
Recruitment Site	-	1.55	-.10	-.32	1.37	-.025	-	1.92	-.07	-	1.92	-.01
Education				1.99	.43	.49***				.92	.45	.27*
AR <sup>2</sup>				-.01		.23***				-.01		.04

Note.  $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ .

Educational attainment ( $\beta = .65, p = .01$ ) made a significant contribution to physical QOL (additional support for Hypothesis 1) over and above the variables entered in the first step and race/ethnicity ( $\beta = -1.49, p = .08$ ; Hypothesis 4) was approaching significance. In Step 3, the interaction between educational attainment and race/ethnicity was added, yet it did not explain variance in physical QOL at a significant level ( $\beta = -.64, p = .19$ ; Hypotheses 5 and 6). All values are presented in Table 5 and the slopes are plotted in Figure 1.

Table 5. Hierarchical Regression Analysis of Predictors of Physical QOL

	Model 1			Model 2			Model 3		
	B	SE	Beta	B	SE	Beta	B	SE	Beta
Age	-.04	.01	-.21**	-.04	.01	-.19**	-.04	.01	-.20**
Gender	-.49	.47	-.07	-.24	.46	-.03	-.24	.46	-.03
Psychological Health	.67	.07	.67***	.65	.07	.64***	.63	.07	.63***
Recruitment Site	-1.24	.45	-.19**	.46	.85	.07	.46	.85	.07
Race/Ethnicity				-1.49	.84	-.22†	-1.47	.83	-.22†
Education				.65	.26	.18*	1.59	.76	.43*
Education x Ethnicity							-.64	.49	-.27
AR <sup>2</sup>				.51***		.54***			.55***

Note.  $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ , †  $0.05 < p < 0.1$ .

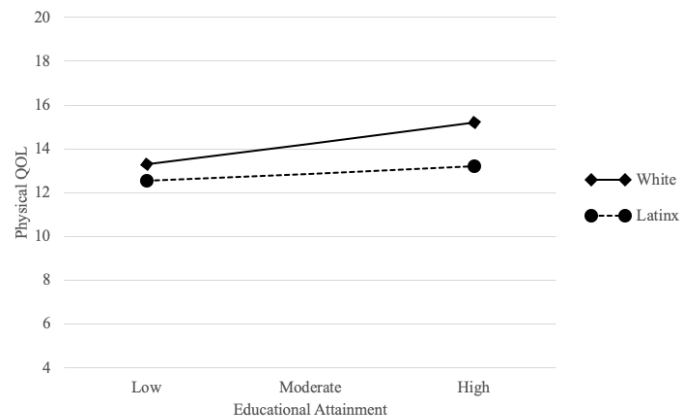


Figure 1. Association between educational attainment and physical QOL moderated by race/ethnicity.

## DISCUSSION

This study was designed to examine the relationship between educational attainment and physical quality of life ratings while also considering the moderating effect of race/ethnicity. Variables known to influence health were also considered in this study (e.g., psychological quality of life, age, and sex). Understanding the role that ethnicity can play in this relationship could address racial/ethnic disparities and help to deliver targeted health messages that take group differences into account and giving people help and resources that are specific to their needs.

Preliminary bivariate correlations displayed a strong, positive relationship between participants' physical quality of life ratings and their respective psychological quality of life ratings, which complements the literature and previous findings. Surtees and colleagues (2008) found that higher emotional distress was associated with an increase in risk for having a stroke for both men and women. In a study that performed a community-wide physical activity involvement, they found that for those who had not previously been involved in much physical activity, an increase in their physical activity came with an improvement in mental health (Harris 2018).

The first hypothesis, that those with higher educational attainment would report higher physical QOL than those with lower educational attainment, was supported and aligns with previous findings. Goldman and Smith (2011) examined three decades of self-reported health and factors that influence ratings and found that education is one of the most important factors in higher QOL scores. The scholars stated that education is valuable in that it protects against the onset of disease, provides better access to insurance, and promotes better health behaviors. Education also promotes the development of skills and traits that are useful for things such as employment, and success in life, which can also ultimately improve QOL ratings (Mirowsky & Ross, 2005; Ross & Wu, 1995).

The distribution of educational attainment differed



between Whites and Latinxs (See Table 1) and showed that more Whites had attained higher levels of education compared to Latinxs. The examination of the positive association between educational attainment and physical QOL was more closely examined with racial/ethnic groups in this study. Along similar lines, the second hypothesis that White participants with higher educational attainment would report higher physical QOL than Whites with lower educational attainment was also supported. However, the third hypothesis that Latinx participants with higher educational attainment would report higher physical QOL than Latinxs with lower educational attainment, was not supported. This finding could be due to the small sample size in the current study, or to outside factors related to Latinx identity such as discrimination that might have attenuated the influence of educational attainment and could reflect social disadvantage despite high levels of education. Higher educational attainment seems to open more doors for resources such as nutritional food that promotes health (Kant & Graubard, 2007), and insurance (McGarry et al., 2014) which are both notable factors in QOL scores, but this may not always be the case for Latinxs, compared to Whites, based on these results.

The subsequent analyses were conducted to give physical health QOL a closer examination that simultaneously considered within and between racial/ethnic group responses. The fourth hypothesis, that White participants would report higher physical QOL than Latinx participants, was not supported. The results did not indicate a significant difference between the groups on physical QOL (while statistically controlling for differences in the recruitment site, age, sex, and psychological QOL), although it was approaching significance ( $p = .08$ ). The fact that physical QOL did not differ at a statistically significant level despite social disadvantage lends partial support to the Latino health paradox. In a previous study conducted by Derek Tang and colleagues (2014), Hispanic participants reported higher physical QOL scores than White participants. However, in other research by Sudano and Baker (2014), Borrell and Dallo (2008), and McGarry et al. (2014), Latinxs were less likely to report good or excellent health and more likely to report fair or poor health in comparison to non-Latinx Whites. It is possible that differences in the measurement approach may lead to different outcomes, which should be explored in future research.

The fifth hypothesis, that Whites with lower educational attainment would report better QOL compared to Latinx with higher educational attainment was not supported. When demographic and socioeconomic indicators were included in the analyses, ethnicity did not make a unique contribution to physical QOL nor did it moderate the relationship. It may be that there are other factors not

measured in the present study that help to buffer the impact of social disadvantage on the physical QOL of Latinxs. For example, Latinx individuals may benefit from stronger, culturally based social support that may help to moderate their quality of life (Mulvaney-Day, Alegria, & Sribney, 2007).

As seen in Table 1, Latinx participants from this sample tended to have lower educational attainment than non-Latinx White participants, and also had lower physical QOL ratings than non-Latinx Whites (although not significantly different). The lower ratings were unexpected in light of the Latino Health Paradox reported in prior research (Turner & Lloyd, 2004). This paradox includes findings that demonstrate that despite having lower social and economic advantages, recent Latinx migrants have better mental health, physical health, and educational outcomes than native residents (Mossakowski, 2003; Burnam, Hough, Karno, Escobar, & Telles, 1987; Ortega, Rosenheck, Alegria, & Desai, 2000; Antecol & Bedard, 2006; Greenman, 2013). In the present study, there was no significant difference in physical QOL found between Whites and Latinxs with higher educational attainment. Additionally, Whites who had lower educational attainment did not have higher physical QOL scores than Latinx participants with higher educational attainment. Importantly, although no interaction was observed, the benefits of educational attainment on physical QOL are steeper for Whites than Latinxs (Figure 1). Although these findings do not directly support the paradox, it does indicate that education may act as a buffer for physical QOL in the Latinx community as well as among Whites.

### Limitations

This study has several limitations. First, the survey was administered in person and required participants to self-report their own health status. Although self-reported responses may introduce social desirability concerns, participants responses also reflect cultural norms and beliefs which are important to capture in health research. Ultimately, individual perceptions (regardless of accuracy) drive quality of life scores. The survey was also administered in two languages, which may have impacted the interpretation of the study items. Additionally, the survey demographics did not include the option of “some college, no degree” for the question about participants’ highest level of education obtained. Research shows that this population includes around thirty-six million people in the U.S. (Shapiro, Ryu, Huie, & Liu, 2019). This exclusion was an error of design in the initial study, thus, this study was unable to account for this population. The broad age range of participants in the data may be a limitation because

it may have masked patterns in the data due to survivorship bias. In other words, younger individuals who passed away, possibly due to health concerns, may have been missed in this data collection while older individuals in this sample may possess characteristic that made them especially resilient. Future longitudinal research may be helpful in discerning the influence of survivorship bias.

Another limitation involves the recruitment sites. The rural center had a majority non-Latinx White participant pool, while the urban recruitment center had a majority Latinx population, and they might have had different community resources available to their locations. Thus, it is possible that the two centers were too different from one another to combine for data analyses, and it might have been useful to recruit from one center or recruit a comparison group from a similar geographic location. Geographic location and race/ethnicity were highly related as indicated by a chi-square test of independence which suggested that a higher percentage of participants at the rural recruitment site were White and a higher percentage of participants recruited at the urban site were Latinx,  $\chi^2(1, N = 137) = 106.93, p < .001$ . As such, although we statistically controlled for the effect of recruitment site, we were unable to adequately separate the contributions of these two variables to participants' physical QOL scores. Finally, it is possible that there are additional factors that influenced physical health QOL in the Latinx population such as social support, discrimination, migration stresses, and more which require further study.

## Conclusion

Education provides general knowledge, promotes better health behaviors, and leads to better job opportunities. Educational attainment appears to be related to physical health quality of life for Latinxs and non-Latinx Whites. However, racial/ethnic disparities persist in regard to educational attainment and physical QOL and need to be better understood. This is especially important because cultural and contextual differences may limit generalizations of findings of studies conducted with non-Latinxs groups. Misapplication of study findings will compromise health-related interventions. For example, this study adds to the conflicting findings related to the Latino Health Paradox and the benefits of educational attainment on physical QOL. Specifically, this study shows that educational attainment benefits both Whites' and Latinxs' perception of physical QOL and that geographic location of services (and possibly the quality of services available, more specifically) may also exert influence and mitigate the negative effects of social disadvantage. As such, strategies that improve access to quality services and support educational attainment are promising strategies for improving the health of Latinxs and Whites.

## ACKNOWLEDGEMENTS

This project was supported by the Gary A. and Sandra K. Sojka Fund for Research, Teaching, Scholarship in Developmental Disabilities, Neuroscience and Human Health.

## REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Antecol, H., & Bedard, K. (2006). Unhealthy assimilation: Why do immigrants converge to American health status levels? *Demography*, 43(2), 337-360.
- Baker, D., Sudano, J., Albert, J., Borawski, E., and Dor, A. (2001). Lack of health insurance and decline in overall health in late middle age. *New England Journal of Medicine*, 345(15), 1106-1112.
- Berdahl, T., and Zodet, M. (2010). Medical care utilization for work-related injuries in the United States 2002-2006. *Medical Care*, 48(7), 645-651.
- Borrell, L., and Dallo, F. (2008). Self-rated health and race among Hispanic and Non-Hispanic adults. *Journal of Immigrant and Minority Health; New York*, 10(3), 229-238.
- Burnam, M., Hough, R., Karno, M., Escobar, J., & Telles, C. (1987). Acculturation and lifetime prevalence of psychiatric disorders among Mexican Americans in Los Angeles. *Journal of Health and Social Behavior*, 28(1), 89-102.
- Cagney, K., Browning, C., & Wallace, D. (2007). The Latino Paradox in neighborhood context: the case of asthma and other respiratory conditions. *American Journal of Public Health*, 97(5), 919-925.
- Colby, S.L., and Ortman, J.M. (2015). Projections of the size and composition of the U.S population: 2014 to 2060. *Current Population Reports*, 1 – 13, U.S Census Bureau, Washington, D.C.
- Delpierre, C., Lauwers-Cances V., Datta, G., Lang, T., and Berkman, L. (2009). Using self-rated health for analyzing social inequalities in health: A risk for underestimating the gap between socioeconomic groups? *Journal of Epidemiology and Community Health; London*, 63(6), 426-432.
- Doty, M., Blumenthal, D., and Collins, S. (2014) The Affordable Care Act and health insurance for Latinos. *JAMA*, 312(17), 1735-1736.
- Goldman, D., & Smith, J. P. (2011). The increasing value of education to health. *Social Science & Medicine* (1982), 72(10), 1728-1737.
- Greenman, E. (2013). Educational attitudes, school peer context, and the "immigrant paradox" in education. *Social Science Research*, 42(3), 698 - 714.
- Harper, A. & Power, M. (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine*, 28(3), 551-558.
- Harris, M. A. (2018). The relationship between physical inactivity and mental wellbeing: Findings from a gamification-based community-wide physical activity intervention. *Health Psychology Open*, 5(1).
- Kant, A., & Graubard, B. (2007). Secular trends in the association of socio-economic position with self-reported dietary attributes and biomarkers in the US population: National Health and Nutrition



- Examination Survey (NHANES) 1971–1975 to NHANES 1999–2002. *Public Health Nutrition*, 10(2), 158-167.
- Kirby, J. and Kaneda, T. (2013). ‘Double jeopardy’ measure suggests Black and Hispanics face more severe disparities than previously indicated. *Health Affairs*, 32(10), 1766-1772.
- Lucas-Carrasco, R. (2012). The WHO quality of life (WHOQOL) questionnaire: Spanish development and validation studies. *Quality of Life Research*, 21, 161-165.
- Ma, J., Pender, M., & Welch, M. (2019) Education Pays 2019: The benefits of higher education for individuals and society. *College Board*.
- McGarry, B., Temkin-Greener, H., and Li, Y. (2014). Role of race and ethnicity in private long-term care insurance ownership. *The Gerontologist*, 54(6), 1001–1012.
- Mirowsky J., & Ross, C.(2005). Education, learned effectiveness and health. *London Review of Education*, 3(3), 205–220.
- Mossakowski, K. (2003). Coping with perceived discrimination: Does ethnic identity protect mental health? *Journal of Health and Social Behavior*, 44(3), 318-331.
- Mulvaney, E., Alegria, M., & Sribney, W. (2007). Social cohesion, social support, and health among Latinos in the United States. *Social Science & Medicine*, 64(2), 477-495.
- Ortega, A., Rosenheck, R., Alegria, M., & Desai, R. (2000). Acculturation and the lifetime risk of psychiatric and substance use disorders among Hispanics. *The Journal of Nervous and Mental Disease*, 188(11), 728-735.
- Ross, C., & Wu, C. (1995). The links between education and health. *American Sociological Review*, 60(5), 719-745.
- Ruiz, J., Campos, B., & Garcia, J. (2016). Special issue on Latino physical health: Disparities, paradoxes, and future directions. *Journal of Latina/o Psychology*, 4(2), 61-66.
- Saxena, S., Carlson, D., Billington, R., & Orley, J. (2001). The WHO quality of life assessment instrument (WHOQOL-Bref): The importance of its items for cross-cultural research. *Quality of Life Research*, 10, 711-721.
- Shapiro, D., Ryu, M., Huie, F., & Liu, Q. (2019). Some college, no degree: A 2019 snapshot for the nation and 50 states. *National Student Clearinghouse Research Center*, 17.
- Sudano, J., and Baker, D. (2006). Explaining US racial/ethnic disparities in health declines and mortality in late middle age: The roles of socioeconomic status, health behaviors, and health insurance. *Social Science & Medicine*, 62(4), 909–922.
- Surtees, P., Wainwright, N.W., Luben, R.N., Wareham, N.J., Bingham, S.A., Khaw, K.T. (2008). Psychological distress, major depressive disorder, and risk of stroke. *Neurology* 70(10), 788-794.
- Tang, D., Gilligan, A., and Romero, K. (2014). Association of patient demographics on quality of life in a sample of adult patients with cardiac arrhythmias. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation* 23(1), 129–134.
- Turner, R. J., & Lloyd, D. A. (2004). Stress burden and the lifetime incidence of psychiatric disorder in young adults: Racial and ethnic contrasts. *Archives of General Psychiatry*, 61, 481-488.