Physical Activity and Positive Psychological Well-Being Attributes Among U.S. Latino Older Adults

ABSTRACT

Lack of physical activity is particularly problematic among U.S. Latino older adults. There is substantial evidence linking physical activity and well-being. However, associations between physical activity and positive psychological well-being among this population have never been studied or measured. Physical activity was compared to five positive psychological well-being measures based on the PERMA model. Secondary data analysis was completed on a sample of 68 Latino American individuals, age 60 and older, compared to 72 non-Hispanic White older adults. Overall, physical activity was positively associated with positive psychological well-being despite race. Pain, functional limitations, and physical restrictions did not moderate the relationship between physical activity and positive psychological well-being among Latino and non-Hispanic White older adults. Further research is needed to clarify whether physical activity and psychological well-being are perceived similarly or differently within various cultures. [*Journal of Gerontological Nursing, 45*(6), 44-56.]

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Race and ethnicity are considered two separate and distinct concepts; however, Latino individuals are often interchangeably identified as Hispanic individuals or people of any race with Spanish origin (Federal Interagency Forum on Aging-Related Statistics, 2016). The U.S. Office of Management and Budget requires federal agencies to use a minimum of two ethnicities in collecting and reporting data. Generally, federal agencies use "Hispanic or Latino" and "Not Hispanic or Latino." Furthermore, on several U.S. Census Bureau (2018) survey questionnaires, the choices are "Mexican," "Puerto Rican," "Cuban," and "another Hispanic, Latino, or Spanish origin." According to Alcoff (2005), the choice of names (Latino versus Hispanic) "is inherently political" (p. 405) and using the term Latino is relevant to the political and economic condition of this minority population.

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Latino individuals are the largest and one of the fastest growing minority groups in the United States. By 2060, the population of Latino older adults age ≥65 is projected to increase to 21.5 million from 3.6 million in 2014 (Federal Interagency Forum on Aging-Related Statistics, 2016). This particular population increase is due to the fact that, on average, Latino individuals in the United States are approximately 15 years younger than non-Hispanic White individuals (Centers for Disease Control and Prevention [CDC]; 2015). Latino individuals had fewer deaths from most leading causes of death, except diabetes, chronic liver disease, and kidney disease. Among Latino individuals, heart disease and cancer contributed the most to mortality (CDC, 2015). According to the 2015 U.S. Census Bureau report, 31% of Latino individuals stated that they were not fluent in English. Sixty-six percent of Latino individuals had a high school diploma compared to 92% of non-Hispanic White individuals, whereas 15% of Latino individuals compared to 34% of non-Hispanic White individuals had a bachelor's degree or higher (Office of Minority Health and Health Disparities, 2018). Census data also showed that the average Latino median household income was $44,782 compared to $61,394 for non-Hispanic White individuals. Meanwhile, 23% of Latino individuals lived at the poverty level in contrast to 10% of the non-Hispanic White population (Office of Minority Health and Health Disparities, 2018). Moreover, Latino individuals had the highest uninsured rates of any racial or ethnic group in the United States. In 2015, 47% of Latino individuals reported having private insurance coverage and 20% were not covered by any health insurance. Among non-Hispanic White individuals, only 6% were without health insurance (Office of Minority Health and Health Disparities, 2018). Language and cultural barriers, lack of access to preventive care, and no health insurance coverage often affect the health and well-being of Latino American individuals, who are not meeting national recommendations for physical activity (Colby & Ortman, 2015; Watson, 2016).

PHYSICAL ACTIVITY

Health practitioners encourage older adults to engage in regular physical activity (HealthyPeople.gov, 2014; World Health Organization, 2002). Physical activity includes formal, leisure, occupational, or household activities, such as walking, vacuuming, or muscle-strengthening exercises (Lim, Waters, Froelicher, & Kayser-Jones, 2008). The U.S. Department of Health and Human Services (USDHHS) recommends older adults participate weekly in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity activity (Elsawy & Higgins, 2010). The 2018 Physical Activity Guidelines for Americans echoed the USDHHS's (2018) recommendations, stating that older adults should remain physically active as their abilities and conditions allow, even if they cannot complete the recommended 150 minutes of moderate-intensity physical activity weekly. However, less than 60% of older adults nationwide engaged in physical activity and strength training (HealthyPeople.gov, 2014). In particular, Latino older adults often lack a history of engaging in exercise, such as jogging or going to the gym to run on a treadmill or lift weights (Marquez et al., 2014). Regular physical activity has shown many benefits to improve health and decrease the risk for diseases, which ultimately reduces the incidence of morbidity and mortality (Ickes & Sharma, 2012).

Benefits of physical activity include lowering the risk of obesity (Bray, Pi-Sunyer, & Martin, 2014), stroke (McDonnell et al., 2013), hypertension (Semlitsch et al., 2013), and type 2 diabetes (Hordern et al., 2012). These risks were more common with higher rates in Latino than White individuals (CDC, 2015). Physical activity reduces the risks of falls (Gill et al., 2016), osteoporosis (Ebeling, Daly, Kerr, & Kimlin, 2013), and vascular dementia (Verdelho et al., 2012) in older adults. As reported in the publication entitled, *Physical Activity is Medicine for Older Adults* (Taylor, 2014), increasing physical activity levels or exercise participation can decrease mortality and improve functional independence in the growing older adult population.

Physical activity supports healthy aging and has been shown to increase quality of life in adults (Anokye, Trueman, Green, Pavey, & Taylor, 2012) inclusive of older adults with HIV (Shah et al., 2016). High quality of life, or life satisfaction, has been the most commonly proposed definition of successful aging, which includes happiness, relationships between desired and achieved goals, social functioning, and overall well-being (Bowling & Dieppe, 2005). In addition, evidence supports that physical activity, whether light (1.6 to 3 metabolic equivalents) or moderate/vigorous (3 to 5.9 and 6+ metabolic equivalents, respectively) intensity, contributes to higher levels of cognitive function in older adults (Howard et al., 2016; Loprinzi, Lee, & Cardinal, 2015), including Latino older adults (Wilbur et al., 2012). Latino older adults were motivated to stay physically active for an improvement in health, quality of work, and physical strength (Mathews et al., 2010). Unfortunately, on average, Latino older adults do not engage in adequate levels of physical activity (August & Sorkin, 2011).

Consequences of physical inactivity are particularly problematic among the fastest growing population of older adults >65 years of age (Elsawy & Higgins, 2010). Inadequate regular exercise is known to increase the risk of illness and injury, including chronic diseases, such as diabetes, common among Latino older adults (Marquez et al., 2014). In addition, perceived poor health and symptoms of physical disabilities related to chronic diseases were frequently reported as major

barriers to participation in physical activity among older adults (Costello, Kafchinski, Vrazel, & Sullivan, 2011). Physical inactivity contributed to lower well-being and poor quality of life, especially among older adults (Anokye et al., 2012). However, relevance of these findings for Latino individuals was unclear, given that this specific population was not included in the study by Anokye et al. (2012).

Many studies on physical activity of older adults did not include an older Latino population, but reported key moderating variables (Farias et al., 2017; Kelly, Edney, Moran, Srikanth, & Callisaya, 2016; Murphy, Niemiec, Lyden, & Kratz, 2016; Stephan,

> **...Latino older adults often lack a history of engaging in exercise, such as jogging or going to the gym to run on a treadmill or lift weights...**

Sutin, & Terracciano, 2014). A *moderating variable*, either quantitative (e.g., satisfaction level) or qualitative (e.g., gender, race), "affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron & Kenny, 1986, p. 1174). The effects of certain moderating variables of various physical activities on psychological well-being in selected advanced age categories were examined in a meta-analysis (Netz, Wu, Becker, & Tenenbaum, 2005). The moderating effect of mean age suggested a gradual decrease in the effect size (i.e., correlation between two variables) of physical activity on well-being as one ages. In the same study, the moderating effect of gender found that physical activity did not affect the well-being of older men and women (Netz et al., 2005). Another study found no significant differences

from the moderating effects of age or educational levels when comparing physically active and inactive groups (Costello et al., 2011).

WELL-BEING

Well-being, an indicator of psychological functioning (McAuley et al., 2000), is a multidimensional concept (Huppert & So, 2013), particularly in the aging population (Douma, Steverink, Hutter, & Meijering, 2017; Netz et al., 2005). *Well-being* is defined as having positive emotions while realizing one's human potential to be fully functioning and satisfied with life (Ryan & Deci, 2001). Positive emotions are referred to as hedonic feelings of happiness (Seligman, 2011). Increased happiness was associated with positive outcomes, such as effective learning, productivity and creativity, social behaviors, good relationships, and improved health and life expectancy (Diener, 2013; Huppert & So, 2013).

Substantial evidence linking physical activity and well-being exists in the literature (Biddle, Fox, & Boutcher, 2003; McAuley et al., 2000; Penedo & Dahn, 2005; Seefeldt, 1986). A meta-analysis of data on older adults without clinical disorders showed greater well-being with regular physical activity; however, life satisfaction did not show more improvement with physical activity in the same group of older adults. This finding suggests that older adults may report compromised physical function yet are completely satisfied with their limitations and life overall (Netz et al., 2005). Many of

these studies were not conducted with Latino older adults; thus, applicability of such findings for Latino individuals is unclear.

THEORETICAL FRAMEWORK
Positive Psychological Well-Being Theory (PERMA Model)

The theoretical, empirical, and applied work of positive psychology was described as an interdisciplinary and multidimensional approach to evaluating interventions and understanding how to achieve a positive outcome and fuller life experiences (Pawelski, 2016a,b; Rickard & Vella-Brodrick, 2014). This positivistic field emphasizes the individual's strengths. *Positive psychology* was originally described as seeking valued experiences, such as well-being, at the subjective level and positive individual traits, such as love and courage, at the individual level (Seligman & Csikszentmihalyi, 2000). Subjective well-being was commonly evaluated in positive psychology and was often termed happiness (Diener, 2000). Accordingly, the targeted outcomes of positive psychology were well-being and happiness (Seligman, 2003).

Based on positive psychology, Seligman (2011) created the well-being theory. His theoretical framework proposed five positive psychological attributes by which individuals can pursue happiness. Possessing greater levels of these five key elements can lead to well-being and happiness, which, in turn, can lead one to flourish. The five dimensions of positive psychological well-being, represented in the PERMA model, are: positive emotions (P), engagement (E), positive relationships (R), meaning (M), and accomplishments (A).

Positive Emotions (P). The first element, positive emotions, is the subjective and optimistic view of the individual's life, including past, present, and future (Seligman, 2011). Feelings of happiness, joy, satisfaction, and content are examples of positive emotions (Seligman, 2003). Such positive

responses were found related to one's intentions to engage in physical activity in later life (Newsom, Shaw, August, & Strath, 2018). Higher levels of positive emotions also have the power to reverse the negative effects of loneliness and mortality in older adults (Newall, Chipperfield, Bailis, & Stewart, 2013).

Engagement (E). The second element, engagement, is a psychological state of being immersed and focused on a particular task or activity (Seligman, 2011). Happy and satisfied people are more engaged in physical activity (Lathia, Sandstrom, Mascolo, & Rentfrow, 2017). Greater frequency of activities and social interactions was related to better health outcomes (Baker, Cahalin, Gerst, & Burr, 2005; Matz-Costa, Carr, McNamara, & James, 2016).

Positive Relationships (R). The third element, positive relationships, is the pursuit of healthy and fulfilling connections with others (Seligman, 2011). Relationships have been found to influence overall health and well-being (Untas et al., 2011) positively (Hemmingsson, Hellénius, Ekelund, Bergström, & Rössner, 2008). Socialization and maintaining health were reported to be motivators for older adults participating in physical activity (Costello et al., 2011).

Meaning (M). The fourth element is meaning, or a sense of belonging to something believed to be greater than one's self (Seligman, 2011). Older adults in an inactive group described physical activity as needing to be purposeful, social, and fun (Costello et al., 2011). This purpose gives meaning to engaging in physical activity and leads to behavioral consistency (McKnight & Kashdan, 2009).

Accomplishments (A). The fifth element is accomplishments, the quest for success or achievement. An intervention that increases social interaction and improves a sense of accomplishment and mood would be engaging older adults in activities, such as Nintendo Wii™ exergames (Chao, Scherer, & Montgomery,

2015). Such forms of exercise have been reported as enjoyable and acceptable methods for physical activity (Jorgensen, Laessoe, Hendriksen, Nielsen, & Aagaard, 2013).

PURPOSE

Seligman's (2011) well-being theory (i.e., PERMA model) provided the theoretical framework for the current study. The PERMA model can be applied across the age spectrum (O'Brien, 2014). A non-representative sample, such as Latino older adults, may have different PERMA scores than other populations due to cultural differences, availability of resources, and obstacles to physical activity. To the best of the authors' knowledge, there are no existing measures of all five components of positive psychological well-being related to physical activity for this particular population. Thus, specific hypotheses about the magnitude of the associations were not made due to unfamiliarity with the PERMA model and the examination of these measures in a non-representative sample using an existing dataset. Rather, associations of these factors were explored using existing data to build empirical support for the model. Informed by Seligman's (2011) well-being theory, the three research questions of the current study were: (1) Is physical activity associated with positive psychological well-being? (2) Does the effect of physical activity on positive psychological well-being vary by race, specifically between Latino and non-Hispanic White older adults? (3) Do obstacles or barriers, such as pain, functional limitations, and physical restrictions, attribute to this correlation between physical activity and positive psychological well-being among Latino and non-Hispanic White older adults?

METHOD
Research Design

The research design for the current study was a secondary analysis, cohort design. The study provided descriptive and analytic information on the

association between positive psychological attributes and physical activity in a cohort of community-dwelling Latino older adults in the United States compared to a cohort of non-Hispanic White older adults. Data were made available through the second author (E.P.H.), an International Resident Assessment Instrument (InterRAI) Fellow (InterRAI, 2017a). Approval was obtained by Hebrew SeniorLife and Northeastern University Institutional Review Boards for this secondary data analysis, which used stored and de-identified data.

Sample

The sample providing the data was selected from the COLLAGE consortium. COLLAGE is a network of senior housing sites across the United States that make use of the InterRAI tools (COLLAGE, The Art & Science of Healthy Aging®, 2008). Community-dwelling residents who are part of the COLLAGE consortium are assessed at baseline (i.e., when initially enrolled) and subsequently reassessed annually.

Inclusion and Exclusion Criteria. Participants who completed the assessments between 2010 and 2016 were included in this secondary data analysis. Participants identified themselves as Latino/Hispanic for the cohort of Latino older adults and White but not Hispanic for the cohort of non-Hispanic White older adults. The sample also comprised individuals 60 or older. Participants who were younger than 60 and living outside of the senior housing sites between 2010 and 2016 were excluded from the study.

A sample of 13,177 adults, including 125 Latino older adults, were in the original dataset. A cohort of 125 non-Hispanic White older adults was matched to Latino older adults according to birth year, gender, education, year assessed, and housing site. Of the 250 participants, 110 were excluded from the analysis due to missing data. For the purpose of this study, the final total sample includ-

ed 140 older adults (68 Latino and 72 non-Hispanic White) from senior housing sites across the United States.

Data Collection

The study used data from the Lifestyle Survey, an InterRAI assessment tool. Overall, InterRAI's instruments have "established a common metric to measure major questions of interest to service providers, planners, and policy makers" (Hirdes et al., 2008, p. 1). These assessment tools have also demonstrated validity and reliability (Carpenter, 2006). Assessment data are collected by a trained staff member during a one-to-one conversation. Data are then entered into a software program designed specifically for the InterRAI assessment system where they are stored and later accessed for subsequent analyses.

The Lifestyle Survey, formerly known as the Wellness Assessment Tool, was designed to assist older adults to develop individualized healthy aging plans, which include measurable and realistic lifestyle goals. The survey comprises 10 sections on physical activity, falls, recreation, health and well-being practices, diet, sleep, relationships, psychological factors, memory, and spirituality. Items on the tool are self-rated, including preferences and satisfaction with wellness activities (InterRAI, 2017b).

Measures

Variables were operationalized by selected Lifestyle Survey items deemed relevant to the PERMA framework and physical activity. Items represent nominal and ordinal levels of measurement, many of which were dichotomous variables. The following section is a description of each variable and how it was measured in the study.

Sociodemographic Variables. Basic sociodemographics, including age, gender (male = 0, female = 1), and education (no schooling = 1, 8th grade or lower = 2, grades 9 to 11 = 3, high school = 4, technical/ trade school = 5, some college = 6, Bachelor's degree = 7, graduate degree = 8), were included.

Dependent Variable. Physical activity level was the dependent variable in the current study and refers to the time spent on any form of physical activity. Physical activity level was measured by the question: "How many total hours of physical activity or formal exercise did you complete in the past 3 days?" Data were coded as an ordinal level measure ranging from 0 (none) to 5 (≥4 hours). Higher scores indicate more hours of physical activity performed in the past 3 days.

Independent Variables. The independent variables were aligned with Seligman's (2011) five elements of positive psychological well-being, which construct the PERMA model.

Positive Emotions (P). Life satisfaction has been an acceptable form of evaluating positive emotions that have been found to formulate during or after performing physical activity (Tsafou, De Ridder, van Ee, & Lacroix, 2016). Thus, positive emotions was measured using two questions: (a) "How satisfied are you with your life as a whole?" and (b) "Do you feel valued (e.g., through role with community, relationships)?" For the first question, data were coded as an ordinal level measure ranging from 0 (*delighted*) to 5 (*unhappy*). Data for the second question were coded 1 = *yes* and 0 = *no*. A new dichotomous variable was created to determine positive emotions. If participants answered either *mostly dissatisfied* or *unhappy* for the first question despite their responses for the second, data were automatically coded as 0. If participants felt valued and any of the first four satisfaction levels (e.g., *delighted*, *pleased*, *mostly satisfied*, and *mixed*), data were coded as 1.

Engagement (E). Activities that are moderately challenging have the potential for an individual to experience a state of *flow*, a deep trance of effortless involvement that occurs when a person gives his/her undivided attention (Csikszentmihalyi, 1991). Engagement was measured by the question: "Do you pursue involvement in the life of your community (e.g., make/keep friends, involved in group activities, respond positively to new activities)?" If participants gave an affirmative response, data were coded as 1; otherwise, they were coded 0 (*no*).

Positive Relationships (R). A person's social connections include community, family, and friends. Positive relationships were operationalized through three separate dichotomous questions from the Lifestyle Survey. The questions were: (a) "Do you have a close friend in the community where you live?"; (b) "Do you have a close friend outside of the community?"; and (c) "Do you feel you can count on others for support?" Data were coded to reflect the quality of relationships older adults have in their community. Affirmative responses to any or all three questions were given a 1; otherwise, a 0 was given for negative responses to all three questions.

Meaning (M). On the Lifestyle Survey, the question that reflected meaning was, "Do you find meaning in day-to-day life?" If the answer was *yes*, data were coded as 1; otherwise, a 0 was given for *no*.

Accomplishments (A). Accomplishments was operationalized by asking the older adult, "Are you able to manage your own home (e.g., cooking, yard maintenance, home repairs, washing dishes)?" Data for this question were coded as an ordinal level measure ranging from 0 (*no problem, I do it on my own*) to 3 (*others do it for me*). Data were recoded to measure this independent variable. If participants answered, "It is becoming a problem, I need more help" or "Others do it for me," data were coded as 0. If participants responded, "No problem, I do it on my own" or "I do it on my own, but I have some limitations," data were coded as 1.

Moderating Variables. The moderating variables for this study were: race (non-Hispanic White = 0, Latino = 1), pain (no = 0, yes = 1), functional limitations (no = 0, yes = 1), and physical restrictions (no = 0, yes = 1). The Lifestyle Survey asks, "What obstacles or barriers keep you from engaging in or adhering to a fitness program?" and lists pain, functional limitations, and physical restrictions with a *yes/no* response to each variable. Functional limitations were distinguished from physical restrictions by examples listed on the Lifestyle Survey. Functional limitations include limited range of motion and easily fatigued, whereas physical restrictions could be from medications, disease, or physician's orders.

Overview of Analyses

Prior to analysis, bivariate correlations were conducted to check assumptions of multicollinearity. Multiple regression was conducted to determine the association between physical activity and positive psychological well-being. Variables were related to physical activity (e.g., pain, functional limitations, physical restrictions) and positive psychological well-being (e.g., positive emotions, engagement, positive relationships, meaning, accomplishments). Statistical significance was set at $p < 0.05$. All statistical data analyses were performed using SPSS version 23.

RESULTS

Participant Characteristics

Table 1 summarizes the participant characteristics, including sociodemographic data and the variables measured for both cohorts. Of the 140 older adults who answered all physical activity and PERMA items measured in the current study, age ranged from 61 to 99 years (mean = 81 years, SD = 8 years). In the age group of 90 to 99, there were twice the number of non-Hispanic White older adults compared to Latino older adults. The Latino sample (n = 68) was 71% female, and the cohort of non-Hispanic White older adults (n = 72) was 76% female. Latino individuals

held fewer technical/trade, college, Bachelor's, and graduate degrees than non-Hispanic White individuals.

Regression Analyses

Correlations among physical activity and the five positive psychological well-being scores are shown

TABLE 1

PARTICIPANT CHARACTERISTICS

Characteristic	Mean (*SD*)	
	Latino Older Adults (*n* = 68)	**Non-Hispanic White Older Adults** (*n* = 72)
Age (years)	80.4 (8.9)	82.1 (7.9)
Physical activity	2.4 (1.2)	2.4 (1.1)
Positive emotions	0.9 (0.3)	0.9 (0.2)
Engagement	0.8 (0.4)	0.9 (0.3)
Relationships	0.9 (0.3)	0.9 (0.2)
Meaning	1.0 (0)	1.0 (0)
Accomplishments	0.8 (0.4)	0.9 (0.4)
Pain	0.5 (0.5)	0.4 (0.5)
Functional limitations	0.5 (0.5)	0.4 (0.5)
Physical restrictions	0.4 (0.5)	0.4 (0.5)
	n (%)	
Age group (years)		
60 to 69	6 (8)	5 (7)
70 to 79	18 (26)	21 (29)
80 to 89	21 (31)	29 (40)
90 to 99	8 (12)	17 (24)
Gender		
Female	48 (71)	55 (76)
Male	20 (29)	17 (24)
Education		
8th grade or lower	4 (6)	2 (3)
Grades 9 to 11	2 (3)	2 (3)
High school	15 (22)	14 (19)
Technical/trade	2 (3)	3 (4)
Some college	10 (15)	13 (18)
Bachelor's degree	7 (10)	19 (26)
Graduate degree	10 (15)	13 (18)

*Note. Data are missing for age group for Latino older adults (*n* = 15) and education for Latino (*n* = 18) and White (*n* = 6) older adults.*

in **Table 2**. The independent variable meaning (M) had no variance in the sample. Physical activity was significantly associated with positive emotions (r = 0.21, $p < 0.05$), engagement (r = 0.23, $p < 0.01$), and accomplishments (r = 0.21, $p < 0.05$). Other significant correlations were

TABLE 2

CORRELATION MATRIX FOR VARIABLES USED IN REGRESSION MODEL

Variable	1	2	3	4	5	6	7	8	9	10
1. PA	1.00									
2. P	0.21*	1.00								
3. E	0.23**	0.28**	1.00							
4. R	0.16	0.15	0.39**	1.00						
5. M	—	—	—	—	1.00					
6. A	0.21*	0.09	0.18*	0.26**	—	1.00				
7. Latino	0.01	−0.06	−0.05	−0.04	—	−0.07	1.00			
8. Pain	0.02	−0.02	−0.08	−0.06	—	−0.18	0.12	1.00		
9. FL	−0.05	—0.10	0.03	−0.10	—	−0.26**	0.10	0.61**	1.00	
10. PR	−0.01	−0.07	0.07	0.00	—	−0.24*	0.05	0.54**	0.62**	1.00

Note. PA = physical activity; P = positive emotions; E = engagement; R = positive relationships; M = meaning; A = accomplishments; FL = functional limitations; PR = physical restrictions.
* $p < 0.05$; ** $p < 0.01$.

TABLE 3

REGRESSION MODEL FOR PHYSICAL ACTIVITY AND POSITIVE PSYCHOLOGICAL WELL-BEING

Variable[a]	Model Summary				Coefficients			
	R	R^2	AR^2	SE	B	SE	b	p Value
P	0.21	0.04	0.04	1.16	0.94	0.38	0.21	0.02
E	0.23	0.06	0.05	1.15	0.78	0.28	0.23	0.01
R	0.16	0.03	0.02	1.17	0.75	0.40	0.16	0.06
A	0.21	0.05	0.04	1.16	0.65	0.26	0.21	0.01

Note. AR^2 = adjusted R^2; SE = standard error; P = positive emotions; E = engagement; R = positive relationships; A = accomplishments.
[a] Dependent variable: physical activity.

observed between positive emotions and engagement ($r = 0.28$, $p < 0.01$), engagement and positive relationships ($r = 0.39$, $p < 0.01$), engagement and accomplishments ($r = 0.18$, $p < 0.05$), positive relationships and accomplishments ($r = 0.26$, $p < 0.01$), accomplishments and functional limitations ($r = −0.26$, $p < 0.01$), accomplishments and physical restrictions ($r = −0.24$, $p < 0.05$), pain and functional limitations ($r = 0.61$, $p < 0.01$), pain and physical restrictions ($r = 0.54$, $p < 0.01$), and functional limitations and physical restrictions ($r = 0.62$,

$p < 0.01$). In summary, older adults who reported increased hours of physical activity were more likely to have higher levels of positive emotions, engagement, and accomplishments. Engagement was the only attribute that was strongly associated with the other three positive psychological well-being variables. Higher pain levels correlated significantly with functional limitations and physical restrictions.

Research Question 1

The first research question posed whether physical activity was asso-

ciated with positive psychological well-being. Separate models considering each positive psychological well-being element were run as: PA = b_0 + b_1 P + e, PA = b_0 + b_1 E + e, PA = b_0 + b_1 R + e, PA = b_0 + b_1 M + e, and PA = b_0 + b_1 A + e. Linear regression model estimates are shown in **Table 3**. Again, meaning (M) had no variance in the sample. Physical activity was significantly associated with three of the five positive psychological well-being attributes: positive emotions ($b = 0.21$, $p = 0.02$), engagement ($b = 0.23$, $p = 0.01$),

TABLE 4

COEFFICIENTS COMPARING LATINO AND NON-HISPANIC WHITE OLDER ADULTS

Variable[a]	Latino Older Adults				Non-Hispanic White Older Adults			
	B	SE	b	p Value	B	SE	b	p Value
P	1.52	0.49	0.36	<0.01	0.12	0.59	0.02	0.84
E	0.67	0.40	0.20	0.10	0.92	0.40	0.27	0.02
R	0.84	0.56	0.18	0.14	0.65	0.59	0.13	0.27
A	0.93	0.35	0.31	0.01	0.32	0.38	0.10	0.40

Note. SE = standard error; P = positive emotions; E = engagement; R = positive relationships; A = accomplishments.
[a] Dependent variable: physical activity.

and accomplishments (b = 0.21, p = 0.01).

Research Question 2

The second question focused on race and whether the association between physical activity and positive psychological well-being differed between Latino and non-Hispanic White older adults. The regression model estimates are displayed in **Table 4**. Among Latino older adults, physical activity was significantly associated with positive emotions (b = 0.36, p < 0.01) and accomplishments (b = 0.31, p = 0.01). As for non-Hispanic White older adults, physical activity was only significant in engagement (b = 0.27, p = 0.02).

Research Question 3

The third study question examined whether the variables pain, functional limitations, and physical restrictions attributed to physical activity and positive psychological well-being among Latino and non-Hispanic White older adults. On the Lifestyle Survey, if the participant answered "yes" to the question, "Are you satisfied with your physical activity and fitness level?," the next question on obstacles or barriers was skipped. Therefore, of the 140 participants, 44 responses were analyzed to eliminate any missing data. Hierarchical regression model estimates are presented in **Table 5**. Standardized coefficients indicated that engagement and pain were the strongest predictors of physical activity and that the effects of engagement and pain on physical activity were approximately 10 times the effect of the other variables included in the regression model. Adding the interaction terms did not make any additional contribution to explaining physical activity among older adults. None of the interaction effects were significant, indicating that the associations between physical activity and the five positive psychological well-being elements, as well as any of the obstacles or barriers, did not depend on whether the older adult was Latino or non-Hispanic White.

DISCUSSION

Using Seligman's (2011) PERMA model in a secondary analysis of data from older adults, the current study explored the association between physical activity and positive psychological well-being attributes among U.S. Latino older adults age 60 and older compared to non-Hispanic White older adults. Using an existing wellness assessment conducted on community-dwelling older adults, this study explored: (a) whether physical activity correlated with the PERMA elements, (b) if the association between physical activity and positive psychological well-being was similar in Latino and non-Hispanic White older adults, and (c) if any differences in the correlation between physical activity and positive psychological well-being among Latino and non-Hispanic White older adults were attributable to pain, functional limitations, and physical restrictions.

The results of the study indicated that physical activity was positively associated with psychological well-being. These findings support a longitudinal study on an intervention program designed to improve physical, mental, and spiritual well-being in individuals older than 60. This intervention program included physical activity and seminars on creativity, psychology, philosophy in life, and communication, all of which can be found intertwined in Seligman's PERMA model (Krawczynski & Olszewski, 2000). When comparing Latino older adults to non-Hispanic White older adults, the relationship between the PERMA elements and physical activity differed. For Latino older adults, physical activity was significantly associated with positive emotions and accomplishments, whereas only engagement was significant among non-Hispanic White older adults.

In the current study, the obstacles or barriers (i.e., pain, functional limitations, and physical restrictions) did not moderate the relationship between physical activity and positive psychological well-being among Latino and non-Hispanic White older adults. However, pain was strongly associated with physical activity. One study of older adults residing in inde-

TABLE 5

HIERARCHICAL REGRESSION MODEL INCLUDING OBSTACLES/BARRIERS TO PHYSICAL ACTIVITY

Model	Variable[a]	Model Summary				Coefficients			
		R	R^2	AR^2	SE	B	SE	b	p Value
1	(Constant)	0.02	0.00	−0.02	1.25	2.00	0.63	—	<0.01
	P					−0.10	0.63	−0.02	0.88
2	(Constant)	0.08	0.01	−0.04	1.26	1.82	0.74	—	0.02
	P					−0.12	0.66	−0.03	0.85
	E					0.24	0.52	0.07	0.65
3	(Constant)	0.09	0.01	−0.07	1.28	2.14	1.44	—	0.15
	P					−0.14	0.67	−0.03	0.84
	E					0.29	0.57	0.09	0.61
	R					−0.36	1.38	−0.04	0.80
4	(Constant)	0.09	0.01	−0.10	1.29	2.13	1.53	—	0.17
	P					−0.14	0.68	−0.03	0.84
	E					0.29	0.58	0.09	0.61
	R					−0.36	1.40	−0.04	0.80
	A					0.01	0.44	0.00	0.99
5	(Constant)	0.19	0.04	−0.09	1.29	1.66	1.59	—	0.30
	P					−0.17	0.68	−0.04	0.80
	E					0.36	0.58	0.11	0.54
	R					−0.20	1.41	−0.03	0.89
	A					0.08	0.45	0.03	0.86
	Pain					0.43	0.40	0.18	0.29
6	(Constant)	0.19	0.04	−0.12	1.31	1.64	1.67	—	0.33
	P					−0.17	0.70	−0.04	0.81
	E					0.35	0.60	0.11	0.56
	R					−0.19	1.45	−0.02	0.90
	A					0.08	0.45	0.03	0.86
	Pain					0.43	0.44	0.17	0.33
	FL					0.02	0.45	0.01	0.97

pendent living in a suburban county found pain-related activity interference to moderate the association between momentary pain and physical activity (Murphy et al., 2016).

Functional limitations of older adults are frequently measured by assessing performance and capacity for activities of daily living, such as bathing and dressing, and instrumental activities of daily living, such as managing one's finances or shopping (Chatterji, Byles, Cutler, See-man, & Verdes, 2015). The questions used from the Lifestyle Survey were aligned with the literature on older adults' functional limitations. Functional limitations and physical restrictions were negatively associated with physical activity among Latino and non-Hispanic White older adults. Physical restrictions impact one's ability to engage in regular physical activity (Prince et al., 2015). Such physical restrictions were related to chronic diseases, such as hypertension, diabe-tes, and Alzheimer's disease, which are highly prevalent among Latino American older adults (CDC, 2015).

LIMITATIONS

Results of this study need to be considered in light of several limitations. Although secondary data analysis is a cost-effective method (Dunn, Arslanian-Engoren, DeKoekkoek, Jadack, & Scott, 2015), it is a limitation, as data are originally collected for another purpose. The existing data

HIERARCHICAL REGRESSION MODEL INCLUDING OBSTACLES/BARRIERS TO PHYSICAL ACTIVITY

Model	Variable[a]	Model Summary				Coefficients			
		R	R^2	AR^2	SE	B	SE	b	p Value
7	(Constant)	0.20	0.04	−0.15	1.32	1.82	1.76	—	0.31
	P					−0.21	0.72	−0.05	0.77
	E					0.36	0.61	0.11	0.56
	R					−0.27	1.48	−0.03	0.86
	A					0.02	0.49	0.01	0.97
	Pain					0.46	0.45	0.19	0.32
	FL					0.13	0.55	0.05	0.81
	PR					−0.21	0.58	−0.09	0.72
8	(Constant)	0.50	0.25	−0.11	1.30	3.02	2.13	—	0.17
	P					−1.35	1.53	−0.32	0.39
	E					1.29	0.91	0.39	0.17
	R					−1.12	1.65	−0.14	0.50
	A					0.28	0.67	0.10	0.69
	Pain					0.25	0.56	0.10	0.66
	FL					−0.49	0.67	−0.20	0.47
	PR					0.29	0.67	0.12	0.67
	P x Latino					1.56	1.79	0.60	0.39
	E x Latino					−2.05	1.25	−0.79	0.11
	M x Latino					0.13	2.24	0.05	0.96
	A x Latino					−0.35	1.17	−0.13	0.76
	Pain x Latino					1.56	1.57	0.56	0.33
	FL x Latino					0.77	1.96	0.28	0.70
	PR x Latino					−2.06	1.33	−0.71	0.13

Note. AR^2 = adjusted R^2; SE = standard error; P = positive emotions; E = engagement; R = positive relationships; A = accomplishments; FL = functional limitations; PR = physical restrictions; M = meaning.
[a] Dependent variable: physical activity.

were not collected to answer the current study's research questions or to test them using Seligman's (2011) positive psychological well-being theory. The second limitation is that the tools were written in English and misinterpretations of questions by non-native English speakers could have existed. Data used in this study were most likely collected in English, as the Lifestyle Survey was not available in Spanish prior to 2015. The use of English language may have led to misunder-standings and inaccuracies in the data collection from participants where English is not their primary language. The third limitation is that the sample size was too small and allowed only the detection of very large effect sizes. Furthermore, the study was limited by the number of responses provided on the Lifestyle Survey. The fourth limitation is that, even though results of secondary data may be more generalizable, this study excluded many other ethnicities and only analyzed data on Latino and non-Hispanic White older adults. Lastly, there was a lack of cultural specificity in the cohort of Latino individuals studied. Race was not specified in the tool used. Within the health care field, it is important to be mindful of individuals' cultural backgrounds to fully understand their behaviors and worldviews (Kubokawa & Ottaway, 2009). For example, Puerto Rican older adults may have different views on their physical activity and varying definitions on the

dimensions of positive psychological well-being compared to Dominican Republican older adults, who are also considered Latino. Hence, the results of the current study must be considered carefully when applied to other older adult populations.

Another limitation to consider is that COLLAGE (2008) is a national consortium of continuing care retirement communities (CCRC), moderate-income and federally subsidized housing programs, and home care as well as community-based agencies. CCRCs can be costly and are not typically covered by Medicare and private health insurance (Ayalon & Green, 2013). Thus, overall, older adults answering the InterRAI assessments may be more financially stable and educated than a majority of those aging in the community. In addition, locations of subsidized homes and CCRCs isolate these older adults from other diverse individuals and social groups in the community (Petersen & Warburton, 2012). This layer of differences may not well represent the overall minority population of Latino older adults.

IMPLICATIONS AND FUTURE RESEARCH

Approximately 90% of U.S. adults age 65 and older have reported a desire to continue living in their own homes or communities (Farber, Shinkle, Lynott, Fox-Grage, & Harrell, 2011). Results of the current study have practical implications for older adults. Incorporating positive psychological well-being and physical activity, both of which promote and support successful aging, could result in happier people living more active lives (Cho, Martin, & Poon, 2014; Lathia et al., 2017).

As health care delivery models change in the United States, "there is an active transformation in the role of the professional nurse in caring for patients across the health care continuum" (Golightly, Kennett, & Stout, 2017, p. 745). Latino American individuals are a growing aging population at risk of debilitating chronic diseases such as hypertension and diabetes. Thus, one recommendation would be for nursing programs to support and promote capstone projects or practicum experiences in subsidized communities and/or CCRCs. To transition to practice, senior nursing students could implement an intervention program, such as Krawczynski and Olszewski's (2000), among minority older adults in local communities. More specifically, such a program should have a physical activity component and seminars on positive psychological well-being. These seminars could be taught and led by nursing students. In addition, the program could be catered to various cultures and populations, who would greatly benefit from a practical and cost-effective program.

Further research should continue to explore whether the PERMA model fits among other groups of U.S. Latino adults 60 and older. Future longitudinal research examining physical activity and positive psychological well-being of older adults should also focus on nurse-led healthy aging plans, interventions, and tools. Lastly, potential research should include larger, more diverse study samples to examine how physical activity and psychological well-being are perceived across various cultures.

CONCLUSION

This study applied Seligman's (2011) five positive psychological well-being attributes related to physical activity in a non-representative sample of Latino older adults in the United States. The elements of the PERMA model can be incorporated in various programs, where nurses, individuals, and communities can personalize education, policy, and interventions to one's needs. Furthermore, the PERMA model can drive areas for improving overall well-being.

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