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Perceived discrimination and physical health-related quality of life: The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study

Kristine M. Molina^{#a,*}, Mayra L. Estrella^{#b}, Ramon Durazo-Arvizu^c, Vanessa L. Malcarne^d, Maria M. Llabre^e, Carmen R. Isasi^f, India J. Ornelas^g, Krista M. Perreira^h, Frank J. Penedoⁱ, Elizabeth Brondolo^j, Linda Gallo^d, and Martha L. Daviglus^b

^aDepartment of Psychology, University of Illinois at Chicago, Chicago, IL, USA

^bInstitute for Minority Health Research, University of Illinois at Chicago, Chicago, IL, USA

^cDepartment of Public Health Sciences, Loyola University, Chicago, IL, USA

^dDepartment of Psychology, San Diego State University, San Diego, CA, USA

^eDepartment of Psychology, University of Miami, Coral Gables, FL, USA

^fDepartment of Epidemiology and Population Health, Einstein College of Medicine, Bronx, NY, USA

^gDepartment of Health Service, University of Washington, Seattle, WA, USA

^hDepartment of Social Medicine, University of North Carolina, Chapel Hill, NC, USA

ⁱDepartment of Medical Social Sciences, Psychology & Psychiatry and Behavioral Sciences, Northwestern University, Chicago, IL, USA

^jDepartment of Psychology, St. John's University, Jamaica, NY, USA

[#] These authors contributed equally to this work.

Abstract

Rationale: The aim of this study was to examine the direct associations of perceived personal and group discrimination with physical health-related quality of life (HRQoL) among Latinx adults. We also tested whether ethnic identity and depression symptoms sequentially mediate these associations.

Method: This population-based study included 5313 Latinx adults, ages 18–74 years, from the Hispanic Community Health Study/Study of Latinos (2008–11) and its Sociocultural Ancillary Study (2010–11). Participants were recruited from the Bronx; NY; Chicago, IL; Miami, FL; and San Diego, CA. Self-reported perceived personal and group discrimination, ethnic identity, depression symptoms, and physical HRQoL were ascertained through interviewer-administered surveys. Survey-weighted path analysis was used to examine direct and indirect effects simultaneously in one analytic model controlling for demographic covariates.

*Corresponding author. Department of Psychology, University of Illinois at Chicago, 1007 W. Harrison Street, Behavioral Sciences Bldg, Room 1050A, Chicago, IL, 60607, USA., kmolina@uic.edu (K.M. Molina).

Results: Path analysis indicated that higher perceived personal discrimination was directly associated with poorer physical HRQoL and this association was only mediated by depression symptoms. In contrast, perceived group discrimination was not directly associated with physical HRQoL. However, each of the direct paths linking perceived group discrimination to physical HRQoL were statistically significant: perceived group discrimination was positively associated with ethnic identity, and ethnic identity was negatively associated with depression symptoms, and, in turn, depression symptoms were negatively associated with physical HRQoL. Our model accounted for 18% of the variance of physical HRQoL.

Conclusions: Perceived personal and group discrimination are differently associated with physical HRQoL. Results highlight the importance of considering self-perceptions of different discrimination forms when evaluating its impact on the physical HRQoL of Latinx adults.

Keywords

Perceived discrimination; Group discrimination; Personal discrimination; Ethnic identity; Depression symptoms; Health-related quality of life; Hispanics; Latinx

1. Introduction

The sociopolitical and racial/ethnic climate presents critical public health concerns about the processes by which experiences of discrimination may shape the health of Latinxs (a gender-neutral term used for describing Hispanics/Latinos) living in the U.S. In the last decades, the U.S. Latinx population has increased dramatically (Krogstad, 2016) and this relatively young racial/ethnic minority group (Krogstad, 2016) experiences a high burden of perceived discrimination (i.e., perceptions of discriminatory treatment based on self-report) in their lives (Arellano-Morales et al., 2015; Pew Research Center, 2016). Findings from the Sociocultural Ancillary Study to the landmark Hispanic Community Health Study/Study of Latinos (HCHS/SOL) showed that nearly 80% of participants reported at least one occurrence of perceived discrimination in their lifetime (Arellano-Morales et al., 2015). According to a national survey of Latinx adults (Pew Research Center, 2016), 60% perceived race/ethnicity relations in the U.S. as generally bad, 52% reported perceived discrimination because of their race/ethnicity, and 20% indicated that their race/ethnicity has made it harder to succeed in life. Exposure to discrimination, defined as perceived unfair treatment by others on the basis of one's race/ethnicity (cf. Lewis et al., 2015), is considered a psychosocial stressor (Arellano-Morales et al., 2015). Perceived discrimination is of significant public health concern because a growing body of research has documented its associations with adverse health-related quality of life (HRQoL) (Brondolo et al., 2011; Howarter and Bennett, 2013; Molina et al., 2013; Otiniano and Gee, 2012; Perreira et al., 2015), a multi-dimensional concept referring to self-perceived mental and/or physical well-being (Ware et al., 1996).

1.1. Perceived personal and group discrimination

Reports of perceived discrimination can have many forms (Lewis et al., 2015) and be directed at different targets including the personal and the group. Perceived *personal* discrimination focuses on discriminatory acts targeted at an individual (Taylor et al., 1996),

while perceived group discrimination refers to discrimination targeted at ingroup members (e.g., other Latinxs or Latinxs as a group) (Shorey et al., 2002). The integral role of collectivist values (i.e., the belief that the group is the basic unit of society, not the individual) in the Latinx culture (Rinderle and Montoya, 2008) suggests that experiences related to the group may be important for their overall health. Further, available evidence has shown that Latinxs are aware of the stigmatization their group faces (Lopez et al., 2010; National Public Radio, 2017; Pew Research Center, 2016; Shorey et al., 2002). For instance, Latinxs report higher levels of perceived group discrimination than of perceived personal discrimination (Shorey et al., 2002), a “personal/group” discrepancy phenomenon (Taylor et al., 1996) that has been documented across disadvantaged groups (Dion and Kawakami, 1996; Ruggiero and Taylor, 1994). The 2017 “Discrimination in America” national survey showed that 78% of Latinx respondents believed there is discrimination against their group (National Public Radio, 2017). Further, about 61% of Latinxs report that discrimination against Hispanics is a “major problem” hindering their group’s ability to succeed in society (Lopez et al., 2010).

Despite the broadly documented presence of self-reported experiences of both personal and group discrimination among Latinxs, prior research on the association between perceived discrimination and HRQoL outcomes has focused only on perceived personal discrimination. These studies have shown that, among Latinxs, higher levels of perceived personal discrimination are associated with worse physical health status (Molina et al., 2013), worse overall health (Brondolo et al., 2011; Otiniano and Gee, 2012), poorer mental health (Howarter and Bennett, 2013; Perreira et al., 2015), and a higher number of unhealthy days and disability days (Otiniano and Gee, 2012). Yet, there is some empirical evidence demonstrating that personal and group level discrimination have differential associations with mental and physical health outcomes across populations. For example, a study with Latino adolescents found that perceived personal discrimination is associated with lower personal self-esteem via lower ethnic group identity, a multi-dimensional construct referring to the importance and salience which an individual attributes to their racial/ethnic group membership and sense of belonging to one’s group (Malcarne et al., 2006; Phinney and Ong, 2007). But, contrastingly, perceived group discrimination is associated with higher personal self-esteem via higher ethnic group identity (Armenta and Hunt, 2009). Similarly, among African immigrants and women living in Belgium, perceived personal discrimination was associated with lower personal self-esteem but perceived group discrimination was associated with higher personal self-esteem (Bourguignon et al., 2006). Among U.S. Black Americans, perceived personal discrimination was associated with worse self-reported mental health but not with self-reported physical health; meanwhile, perceived group discrimination was independently associated with better mental and physical health (Hagiwara et al., 2016).

To our knowledge, it remains unknown whether perceived personal discrimination and perceived group discrimination have varying associations with HRQoL outcomes among Latinxs. A better understanding of potential modifiable factors, including experiences of perceived discrimination in its multiple forms, that may shape HRQoL is warranted as Latinxs report worse HRQoL than their non-Hispanic White counterparts (Zack, 2013). In the next decades, as the Latinx population living in the U.S. is rapidly growing and aging

(Krogstad, 2016), the improvement and maintenance of HRQoL will be increasingly important.

1.2. The rejection identification model

Another gap in the literature is that the mechanisms that link perceived discrimination and HRQoL among Latinx adults are not well understood. This study contributes to address this gap by focusing on the physical component of HRQoL. We posit that perceived personal and group discrimination are associated with physical HRQoL through two psychosocial factors: ethnic identity and depression symptoms. The Rejection-Identification Model (RIM) proposed by Branscombe et al. (1999) served as our theoretical premise for focusing on ethnic identity and depression symptoms as two potential pathways linking perceived discrimination to physical HRQoL among Latinxs. The RIM argues that perceiving personal discrimination may lead individuals to internalize this devalued self and could contribute to a lower sense of group belonging. In contrast, perceiving group discrimination may lead individuals to identify more with their racial/ethnic group as an active, coping approach for maintaining a sense of group belonging (Branscombe et al., 1999). Additionally, the RIM posits that higher ethnic identity will result in higher self-esteem and psychological well-being. Armenta and Hunt (2009) further proposed that the self-protective effects for psychological well-being are only present when racial/ethnic minorities perceive group discrimination instead of personal discrimination.

Finally, we posit that the RIM has applicability beyond self-esteem and psychological well-being and could also be applied to examinations of related concepts: ethnic identity, depression symptoms, and subjective physical health. Ethnic identity is broadly conceptualized as a protective psychosocial factor (Phinney and Ong, 2007; Sanchez and Vargas, 2016) and it has been associated with various positive well-being outcomes among members of disadvantaged groups (Smith and Silva, 2011). Research has documented inverse cross-sectional associations between ethnic identity and depression symptoms among African Americans adults (Williams et al., 2012), African American women (Settles et al., 2010), U.S. Filipino adults (Ai et al., 2015), a culturally diverse sample of U.S. adolescents (Tummala-Narra, 2015), and African American adolescents (Gaylord-Harden et al., 2006). Notably, despite strong theoretical and empirical foundations, the associations between ethnic identity and depression symptoms among Latinx adults have not been previously examined (to our best knowledge). Furthermore, it is well-recognized that higher levels of psychological well-being are associated with better HRQoL outcomes (Brondolo et al., 2011; Molina et al., 2013). This prediction has also been supported by research involving Latinxs where it was found that perceptions of personal discrimination are indirectly associated with poorer self-rated physical health via lower perceived social status (a concept closely related to one's identity) and higher depression symptoms (Molina et al., 2013). In sum, theoretical and empirical works suggest that ethnic identity and depression symptoms may jointly link experiences of discrimination with physical HRQoL, albeit in different ways.

1.3. Present study

While the association between perceived personal discrimination and physical HRQoL has been examined in previous studies, the association between perceived group discrimination and physical HRQoL has not been examined. Further, the potential mechanisms underlying these associations remain largely unknown. To address these empirical gaps, the aims of this study are to: (1) investigate potential differences in the association of perceived personal and group discrimination with physical HRQoL; and (2) examine the role of ethnic identity and depression symptoms as sequential mediators of the associations of perceived personal and group discrimination with physical HRQoL. Guided by the RIM, we hypothesized the following:

Hypothesis 1. Higher perceived personal discrimination will be indirectly associated with poorer physical HRQoL through lower ethnic identity and higher depression symptoms.

Hypothesis 2. Higher perceived group discrimination will be indirectly associated with better physical HRQoL through higher ethnic identity and lower depression symptoms.

2. Methods

2.1. Sample and procedures

We used data from the HCHS/SOL Sociocultural Ancillary Study (SCAS) (2009–2010). An in-depth description of HCHS/SOL and SCAS sampling procedures, recruitment, and study protocols are reported elsewhere (Gallo et al., 2014; LaVange et al., 2010; Sorlie et al., 2010). The HCHS/SOL is a population-based cohort study of 16,415 self-identified Latinx adults, aged 18 to 74 at baseline, of diverse backgrounds (i.e., Cuban, Central American, Dominican, Mexican, Puerto Rican, and South American). HCHS/SOL was primarily designed to study prevalence and development of disease among Hispanics/Latinos (LaVange et al., 2010). The sampling design consisted of a stratified two-stage area probability sample of households located in four field sites: Chicago, Illinois; Miami, Florida; Bronx, New York; and San Diego, California (LaVange et al., 2010). Individuals were eligible to participate if they self-identified as Hispanic/Latino, were able to complete a study examination, and reported no plans to move from the study area. Enrolled participants underwent an extensive examination that included biological, behavioral, and sociodemographic assessments.

The SCAS cohort, comprised of a subsample of the baseline HCHS/ SOL cohort, was designed to identify sociocultural and psychosocial correlates of disease (Gallo et al., 2014). HCHS/SOL participants who consented to be contacted for future studies, and were available to attend another visit within 9 months of their baseline examination were eligible to participate in the SCAS. Study recruiters contacted eligible persons ($N = 7312$), of whom 5313 (72.6%) consented to participate. The SCAS sample is representative of the main HCHS/SOL cohort, except for lower participation in some groups with higher socioeconomic status (Gallo et al., 2014). Data collection for the SCAS took place via face-to-face interviews in Spanish or English administered by trained interviewers. Study participants provided written informed consent, were reimbursed for travel expenses to and from the study site, and were provided \$60 for their participation. Institutional Review

Boards at each study site approved all HCHS/SOL and SCAS study procedures. We used maximum likelihood robust (MLR) estimation to include all HCHS/SOL-SCAS respondents ($N = 5313$) in the analyses.

2.2. Measures

Perceived personal discrimination was assessed using the 17-item Brief Perceived Ethnic Discrimination Questionnaire-Community Version (Brief PEDQ-CV) (Brondolo et al., 2005). The Brief PEDQ-CV is designed to measure the frequency of experiences of four aspects of discrimination: exclusion/rejection, stigmatization, discrimination at work/school, and threat/aggression. Participants were asked: “How often have any of the things listed below happened to you?” Each item (e.g., “Have others hinted that you must not be clean because of your race or ethnicity?”) is rated on a 5-point frequency scale (1 = *never happened* to 5 = *very often*). Total score is derived for those who answered at least 75% of the full scale; higher scores represent greater exposure (range = 17 to 85). In the HCHS/SOL SCAS sample, the construct validity and dimensionality of the Brief PEDQ-CV was confirmed (Arellano-Morales et al., 2015). The scale has also shown predictive validity in a community-based sample of racially/ethnically diverse adults (Brondolo et al., 2005).

Perceived group discrimination was measured using the Perceived Discrimination subscale of the Scale of Ethnic Experience (Malcarne et al., 2006), which assesses multiple components of ethnic-based experiences. In this study, we focused on 7 items regarding the extent of agreement (1 = *strongly agree* to 5 = *strongly disagree*) with statements about perceived discrimination targeted at their ethnic group (e.g., “I often have to defend my ethnic group from criticism by people outside of my ethnic group”). We excluded 2 items of the PD subscale (i.e., “In my life, I have experienced prejudice because of my ethnicity” and “I have not felt prejudiced against in American society because of my ethnic background”) because they referred to discrimination targeted at the individual. Five of the seven items were reverse coded. A total score is derived for those who answered at least 80% of the full scale; higher scores reflect greater exposure.

Ethnic identity was measured using the 10-item Ethnic Identity subscale of the Scale of Ethnic Experiences (Malcarne et al., 2006), which assesses participant agreement with statements about their ethnic background. Items (e.g., “I have a strong sense of myself as a member of my ethnic group.”) are rated on a 5-point scale ranging (1 = *strongly agree* to 5 = *strongly disagree*); higher scores represent a greater sense of ethnic identity. Previous research has shown good reliability, internal consistency, and construct validity for Latinx adults (Malcarne et al., 2006).

Depression symptoms were measured with the 10-item version of the Center for Epidemiologic Studies Depression Scale (CESD-10) (Andresen et al., 1993). The CESD-10 is designed to assess self-reported depression symptoms in the general population. Participants are asked how often they have experienced symptoms such as “I had trouble keeping my mind on what I was doing” in the past week. Response options range from 0 = *rarely or none of the time* to 3 = *all of the time*. Two items were reverse-coded. Scores for the 10-items are added to create a total score; higher scores indicate more depression symptoms. Consistent with previous studies (Björgvinsson et al., 2013), the CESD-10 was

shown to have strong psychometric properties in the HCHS/SOL study (González et al., 2017).

Physical HRQoL was assessed via the Physical Component Summary (PCS) score of the 12-item Short-Form Health Survey (SF-12) (Ware et al., 1996), a measure widely used in population-based studies to provide a subjective evaluation of physical well-being. Participants are asked about self-perceptions on their general health status, problems with their regular daily activities, and pain that interferes with their normal routine (e.g., “During the past 4 weeks, how much did pain interfere with your normal work including both work outside the home and housework?”). The format of response options varies based on the question asked. Per guidelines, the PCS score was calculated by weighting each item using the standard US norm-based methods and summing them to create a score (Ware et al., 1996). Higher scores indicate greater physical HRQoL (range = 0–100). High reliability and validity of this scale have been reported for Latinx adults (Salinero-Fort et al., 2015).

Covariates. Path analyses were adjusted for the following self-reported demographic covariates: age, sex, Hispanic/Latino background (i.e., Dominican, Central or South American, Cuban, Mexican, Puerto Rican, and other [including other and more than one Hispanic/Latino background]), highest level of education, annual household income, employment status, marital status, health insurance status, language preference, years living in the U.S./nativity (i.e., U.S.-born; foreign-born and < 5 years in U.S.; foreign-born and 5 but < 10 yrs; foreign-born and 10 yrs), and field site. In the HCHS/SOL, Puerto Ricans were considered “U.S.-born” if they were born in one of the 50 states (i.e., mainland) while those who were born in Puerto Rico (i.e., island) were considered “foreign-born” (Perreira et al., 2015). Language preference was assessed using the six-item language subscale of the Short Acculturation Scale for Hispanics (SASH) (Marin et al., 1987). Items (e.g., “What language(s) do you usually speak at home?”) are rated on a 5-point scale ranging from 1 = *only Spanish* to 5 = *only English*. A sum of the six items was created; higher scores indicate a higher level of English language preference (range = 1–5). Cronbach’s alpha was 0.93 in the current sample.

2.3. Analytic strategy

All reported values were weighted to account for the disproportionate selection of the sample and to adjust for any bias effects due to differential nonresponse in the selected sample with the exception of sample size which is unweighted. Weights were also trimmed to limit precision losses and calibrated to the 2010 Census characteristics by age, sex, and Hispanic/Latino background in each field site’s target population. All analyses also account for cluster sampling and the use of stratification in sample selection. Tests of significance were two-sided at a 5% level. Univariate and bivariate analyses were conducted with Stata 14 (StataCorp, 2015), whereas path analysis was conducted in Mplus Version 7.1 (Muthén and Muthén, 2012).

Weighted univariate statistics were used to describe the sample. Weighted Pearson’s r correlation coefficient was used to examine correlations between key study variables (i.e., personal discrimination, group discrimination, ethnic identity, depression symptoms, and

physical HRQoL). Covariates were chosen based on prior empirical studies and those associated with key study variables at p -values $\leq .25$ were included (Heeringa et al., 2010).

Weighted path analysis was used to examine direct and indirect effects simultaneously, as hypothesized in our a priori model, controlling for covariates. Although MLR is robust to violations of model assumptions (e.g., non-normality and heteroscedasticity), the skewness and kurtosis index of endogenous variables were examined. The deviation from normality was acceptable: The skewness and kurtosis index were below 3 and 10, respectively (Kline, 2011). The endogenous variables had small amounts of missing data: personal discrimination ($n = 18$, 0.34%); group discrimination ($n = 45$, 0.85%); ethnic identity ($n = 53$, 1%); depression symptoms ($n = 41$, 0.77%), and physical HRQoL ($n = 42$, 0.79%). Therefore, the MLR approach was employed to estimate simultaneously all data available for parameter estimation (Kline, 2011). Missingness under the MLR approach has been shown to produce unbiased parameter estimates and standard errors (Enders, 2010).

The path model was defined as fitting underlying data adequately according to global goodness-of-fit indices: Comparative Fit Index (CFI) ≥ 0.95 ; Standardized Root Mean Square Residual (SRMR) < 0.08 ; and Root Mean Square Error of Approximation (RMSEA) < 0.06 (Kline, 2011). Additional support for the point estimate of the RMSEA is demonstrated if the upper and lower bound values of the 90% confidence interval (CI) are < 0.05 (Kelley and Lai, 2011; MacCallum et al., 1996). Total, direct, and specific indirect effects, standard errors (SE), and CIs were computed using the multivariate delta method (MacKinnon, 2008). The SE estimates were used to test whether each of the indirect effects are different from zero through z -statistics (i.e., $z > 1.96$) (MacKinnon, 2008). All path regression coefficients (β) included in the figures are standardized for ease of interpretation of effect sizes. In path analysis, considerations of alternative path models are conducted following results showing poor statistical model fit to the data (Kline, 2011). As such, in secondary analyses, we tested an alternative model that was developed based on results of the prior model and relevant theory.

3. Results

3.1. Descriptive and bivariate statistics

Table 1 presents the distribution of demographic characteristics for the overall HSCH/SOL SCAS sample. Mean age was 42.48 years ($SD = 15.48$) and 55% were estimated to be women. Respondents of Mexican background (37%) represented the largest Latinx group. It was estimated that 39% had completed high school or equivalent, 18% reported an annual household income less than \$10,000, and 60% were unemployed. About half of the participants (51%) were estimated to be foreign-born (i.e., not born in one of the U.S. 50 states) and had lived in the U.S. ≥ 10 years.

Table 2 shows means, standard deviations (SD), reliability of scales, and zero-order bivariate correlations of variables in the path model. Personal discrimination was positively correlated with group discrimination ($r = 0.31$, $p < .001$) and depression symptoms ($r = 0.24$, $p < .001$), and negatively correlated with physical HRQoL ($r = -0.05$, $p < .05$). Group

discrimination was positively correlated with ethnic identity ($r = 0.08$, $p < .01$) and depression symptoms ($r = 0.24$, $p < .001$).

3.2. Path analysis

Fig. 1 shows the standardized regression coefficients, SE, and p -values of the hypothesized path model (adjusted for covariates). First, analysis of direct effects for perceived personal discrimination indicated that it was not associated with ethnic identity but was positively associated with depression symptoms and negatively associated with physical HRQoL. The total indirect effect of perceived personal discrimination on physical HRQoL via both ethnic identity and depression symptoms was not statistically significant. However, the specific indirect effect of perceived personal discrimination to physical HRQoL via depression symptoms was statistically significant ($I = -0.015$, $SE = 0.006$, $p < .01$, 95% $CI = -0.029$, -0.005). This suggests that greater levels of perceived personal discrimination are associated with higher depression symptoms, and, in turn, with worse physical HRQoL.

Second, analysis of direct effects for perceived group discrimination indicated that it was positively associated with ethnic identity but was not associated with depression symptoms or physical HRQoL. The total indirect effect of perceived group discrimination on physical HRQoL via both ethnic identity and depression symptoms was non-significant. Also, the specific indirect effect of perceived group discrimination to physical HRQoL through depression symptoms was non-significant. However, all path estimates that comprise the indirect paths were significant. Particularly, ethnic identity was negatively associated with depression symptoms; and depression symptoms were negatively associated with physical HRQoL. In general, the path model had low fit to the data: CFI = 0.840; SRMR = 0.014; and RMSEA = 0.043 (90% CI = 0.038, 0.048). Additionally, the total effect ($\beta = -0.08$) of perceived personal discrimination to physical HRQoL was larger than the direct effect ($\beta = -0.06$) and the total indirect effect ($\beta = -0.02$) via depression symptoms. The direct effect of perceived personal discrimination to physical HRQoL was larger than the indirect effect via depression symptoms; particularly, 75% of the effect of perceived personal discrimination on physical HRQoL was direct while 25% was indirect via depression symptoms.

3.3. Alternative path model

Based on our findings, we analyzed an alternative path model (Fig. 2) with changes to the paths hypothesized in our a priori model. First, a path from perceived personal discrimination to perceived group discrimination was included due to the significant correlation ($r = 0.31$, $p < .001$) observed between both measures of discrimination. This added direct association between perceived personal discrimination and group discrimination is also consistent with socialcognitive theories of racism (Brondolo et al., 2017; Hicken et al., 2013), which posit that experiences of personal discrimination may contribute to heightening awareness of group discrimination or propensity to see environmental events as being discriminatory, given that personal discrimination may activate racism-related schemas about oneself, others, and the world, intensifying racism-related vigilance and appraisals of threat toward an individual's sense of social belonging (Brondolo et al., 2017). Second, the three direct paths that were nonsignificant were removed; that is, the path between perceived personal discrimination and ethnic identity, the

path between perceived group discrimination and depression symptoms, and the path between perceived group discrimination and physical HRQoL.

When this alternative model was tested, analysis of direct effects for perceived personal discrimination indicated that it was positively associated with group discrimination. Perceived group discrimination was positively associated with ethnic identity, which was negatively associated with depression symptoms; in turn, depression symptoms were negatively associated with physical HRQoL. The overall fit of this alternative model was excellent: CFI = 0.965; SRMR = 0.007; and RMSEA = 0.020 (90% CI = 0.015, 0.025). In the alternative path model, the direct effect of perceived personal discrimination to physical HRQoL ($\beta = -0.06$) and indirect effect via depression symptoms ($\beta = -0.02$) were the same as in the a priori model because the specific indirect path that was added from personal perceived discrimination to physical HRQoL (through personal group discrimination, ethnic identity, and depression symptoms) was zero. Finally, the effect size of the direct path from perceived personal discrimination to depression symptoms ($\beta = 0.25$) was similar to effect size of the direct path from perceived personal discrimination to perceived group discrimination ($\beta = 0.28$). In other words, a 1-SD increase in perceived personal discrimination increases depression symptoms and perceived group discrimination, respectively, by 3% of a SD unit.

4. Discussion

Our results indicate that perceived personal and group discrimination have different associations with physical HRQoL. In our hypothesized, a priori model perceived personal discrimination was directly and indirectly associated with physical HRQoL, an association mediated by depression symptoms. Perceived group discrimination was not directly associated with physical HRQoL. However, every direct path in our hypothesized model linking perceived group discrimination to physical HRQoL was statistically significant. In our alternative model, perceived personal discrimination was associated with higher perceived group discrimination. Perceived group discrimination was associated with higher ethnic identity, which was associated with lower depression symptoms; and depression symptoms were associated with lower physical HRQoL. In both models, 75% of the effect of perceived personal discrimination on physical HRQoL was direct while 25% was indirect through depression symptoms. Based on Cohen's (1992) effect size classification, the magnitude of the standardized regression coefficients can be considered small effect sizes. Overall, our findings provide support for components of the RIM (Branscombe et al., 1999) and biopsychosocial and cognitive models of racism (cf. Brondolo et al., 2017).

Consistent with our first hypothesis as well as with previous research, higher perceived personal discrimination was directly associated with worse physical HRQoL (Molina et al., 2013; Otiniano and Gee, 2012). However, contrary to our hypothesis, this association was not mediated through both lower ethnic identity and higher depression symptoms. Instead, our findings showed that only depression symptoms partially accounted for the association between higher levels of perceived personal discrimination and poor physical HRQoL. Consistent with biopsychosocial models of racism (Brondolo et al., 2017), these results suggest that exposure to perceived personal discrimination may elicit psychological

responses (e.g., negative affect and depressed mood) that could increase risk of poor physical health status. Our findings corroborate research showing that, particularly among Latinxs, psychological distress is a mediator of the relation between personal discrimination and indicators of HRQoL including self-rated health and physical health status (Brondolo et al., 2011; Molina et al., 2013). Previous studies have also demonstrated consistent associations of perceived personal discrimination and mental health (Lee and Ahn, 2012).

Our null results regarding the mediating role of ethnic identity on the association between perceived personal discrimination and physical HRQoL may have differed from previous research due to methodological differences. Prior studies mainly focused on adolescents (Armenta and Hunt, 2009), used single-item measures for perceived personal discrimination (Armenta and Hunt, 2009), or assessed ethnic identity with items tapping only into centrality of one's self-concept (Armenta and Hunt, 2009; Romero and Roberts, 2003) versus its multi-dimensional nature (Phinney and Ong, 2007). Further, threats to the self may be more salient at stages where one's identity is still in flux rather than in adulthood where ethnic identity is more stable and when one may be better able to attribute unfair treatment to systemic factors (Branscombe et al., 1999). Research has consistently documented that members of disadvantaged groups including Latinxs tend to report more perceived group discrimination than perceived personal discrimination (Dion and Kawakami, 1996; Hagiwara et al., 2016; Ruggiero and Taylor, 1994; Shorey et al., 2002), a phenomenon known as "personal/group discrimination discrepancy" (Taylor et al., 1996). Therefore, experiences of personal discrimination may not be a sufficiently potent threat to impact the ethnic identity of Latinxs.

Contrary to our second hypothesis, we did not observe a direct association between perceived group discrimination and physical HRQoL. This null finding of perceived group discrimination and physical HRQoL was in contrast with the only other study (Hagiwara et al., 2016), to our knowledge, demonstrating that perceived group discrimination was independently associated with better subjective mental and physical health among Black American adults. However, our findings corroborate those of others (McGarrity et al., 2013), which find that perceived group stigma is not associated with mental health. The reasons for the lack of direct effect of perceived group discrimination to physical HRQoL in our model are largely unknown. It is plausible that perceived group discrimination is associated with health-related measures (e.g., depressive symptoms, physical HRQoL), but because it may be a more distal type of stressor, it may not have been associated with health outcomes, particularly when we adjust for perceived personal discrimination (McGarrity et al., 2013). To test this idea, we ran supplemental analyses with perceived group discrimination only in the path model (i.e., not adjusting for perceived personal discrimination). Indeed, we found that group discrimination was associated with increased levels of depression symptoms ($\beta = 0.09, p < .001$), and though in the expected direction, it was not associated with physical HRQoL ($\beta = -0.02, p > .05$). Moreover, the association between perceived group discrimination and physical HRQoL was accounted for by depression symptoms ($I = -0.007, SE = 0.003, p < .05, 95\% CI = -0.013, -0.001$). In other words, perceived group discrimination was associated with increased depression symptoms, and in turn, with poorer physical HRQoL. Thus, perceived personal discrimination, relative to perceived group discrimination, appears to be a more proximal social stressor in the lives of Latinxs.

We also found that the indirect effect of perceived group discrimination to physical HRQoL via ethnic identity and depression symptoms did not reach statistical significance. However, we found that every direct path in our hypothesized model linking perceived group discrimination to physical HRQoL via ethnic identity and depressive symptoms was statistically significant. In particular, our findings indicate that higher levels of perceived group discrimination are positively associated with ethnic group identity, which is sequentially associated with less depression symptoms and better physical HRQoL. Still, our findings are aligned with the reasoning postulated in the RIM that, for racial/ethnic minorities, perceiving group discrimination contributes to stronger group identification and this, in turn, is protective of psychological well-being. Our findings also provide evidence of an inverse cross-sectional association between ethnic identity and depression symptoms among Latinx adults, an area that has been largely understudied in previous research.

In the present study, the effect size of perceived personal discrimination on depression symptoms ($\beta = 0.25$) was similar to the effect size of perceived personal discrimination on perceived group discrimination ($\beta = 0.28$), underscoring the need for additional research on the latter associations among Latinx adults. A recent study found that perceived group discrimination (vs. other identity-relevant variables) explained the majority of variation in the group identity of Latino adults (Sanchez and Vargas, 2016). Building on research on group consciousness and linked common (i.e., group) fate (Sanchez and Vargas, 2016; Shorey et al., 2002), our findings suggest that among groups from collectivist cultures, health status may be intricately connected to the experiences of others in their groups. Therefore, in the context of perceived group discrimination, the RIM may be a useful framework for understanding the link between perceived group discrimination and physical HRQoL.

Finally, findings from our alternative model were consistent with social-cognitive theories of racism stating that experiences of personal discrimination may result in racism-related vigilance, heightening one's awareness of racial discrimination or propensity to see environmental events as being discriminatory (Brondolo et al., 2017; Hicken et al., 2013). Studies among African Americans have found that vigilance in response to discrimination is not only based on an individual's prior experiences of discrimination but also on the experiences of one's community (as cited in Hicken et al., 2013). Indeed, when one perceives personally-mediated discrimination, this may motivate a shift in group member's construals of identification from self to group (cf. Brondolo et al., 2017). Thus, our alternative model suggests that, although personal experiences with discrimination may negatively impact one's mental and physical health, they may also facilitate group consciousness and awareness of discrimination against in-group members. This heightened awareness of group discrimination perhaps lessens Latinxs' likelihood to attribute personal discrimination to the self and internalize it, helping them to preserve their mental and physical health through positive ethnic group identity (Cronin et al., 2012; Shorey et al., 2002).

4.1. Study limitations and future directions

There are several key study limitations that warrant consideration. Mainly, causality cannot be inferred given our cross-sectional study design. There is evidence that perceived discrimination predicts subsequent depression symptoms (see Pascoe and Smart Richman, 2009), which are causally related to lower HRQoL (Ruo et al., 2003). However, few studies have examined the association between perceived discrimination and ethnic identity over time (Cronin et al., 2012). Although cross-sectional path analysis can provide evidence that some paths are more probable than others (Shrout and Bolger, 2002), longitudinal analysis will be necessary to evaluate the direction of relationships included in our path model.

We did not examine the role of race given that data were not available. Latinx Blacks and those with self-reported darker skin color generally experience higher levels of discrimination (Araújo and Borrell, 2006), and are more likely to rate their health as fair/poor than Latinx whites (Borrell and Dallo, 2008; Perreira and Telles, 2014). Likewise, racialization processes influence ethno-racial identity (Borrell, 2005; Golash-Boza and Darity, 2008). Future studies should aim to account for racial heterogeneity to better explain the differential health profiles that exist among Latinxs.

Another study limitation is that we were unable to include anxiety symptoms as a covariate. Anxiety symptoms have been shown to correlate with depression symptoms (Camacho et al., 2015) and HRQoL (Creed et al., 2002), and are associated with functional status, self-reported disability days, and physician visits (Kroenke et al., 2007). Therefore, anxiety symptoms are expected to be directly associated with impaired physical HRQoL (Rapaport et al., 2005). Future studies should aim to include anxiety symptoms as a theoretically relevant health covariate. Other relevant health-related covariates which we were unable to test include chronic health conditions, disability, and lifestyle factors.

Further, our sample was comprised of Latinx adults living in metropolitan areas and results may not generalize to those living in other regions (e.g., rural areas and those with a growing population of Latinx immigrants such as the South and the Midwest). This factor is particularly relevant to health because prior research has found that several factors related to the migration process contribute to increased depression symptoms in Latinx immigrants (Ornelas and Perreira, 2011). The increased population growth and dispersion of Latinxs across the U.S. suggests a need for investigating how demographic shifts across localities drive the nature, occurrence, and frequency of different forms of self-reported discrimination against this population. Moreover, adverse perceived and objective neighborhood characteristics are associated with worse health outcomes in response to ongoing stressors (O'Brien et al., 2018; Scott et al., 2018), representing additional independent contributors to adverse HRQoL. Future studies should examine how neighborhood characteristics relate to health outcomes in the context of perceived discrimination among Latinxs.

Additionally, although beyond the scope of our study, we recognize that interlocking social structures and identities position individuals differently within the U.S. social hierarchy. As such, the power, privileges, and disadvantages that are embedded within these social systems shape exposure to different forms of discrimination (Arellano-Morales et al., 2015) and their health costs (Molina et al., 2013). Guided by an intersectional health equity lens, future

studies should examine potential within-group variation in exposure to different forms of discrimination and the underlying mechanisms of the discrimination and physical HRQoL association among Latinxs.

Lastly, self-reported perceptions of discrimination may be confounded by social desirability or dispositional tendencies resulting from the need to cope with chronic exposure to discrimination (Mendoza-Denton et al., 2002). On average, low-to-moderate levels of perceived personal discrimination and group discrimination were reported; if a reporting bias exists in our sample, it is likely to be in the direction of under-reporting of negative events. Prior research indicates associations between perceived discrimination and health indicators remain even after accounting for social desirability and dispositional attributes (Williams and Mohammed, 2009).

5. Implications

Study findings have both clinical and public health implications. First, ongoing assessment of perceived discrimination as a psychosocial stressor and dissemination of culturally-relevant mental health resources are important for clinical practice with Latinxs (cf. Hemmings and Evans, 2018). Drawing from race-based trauma approaches (Hemmings and Evans, 2018), targeting the role of perceived personal discrimination and developing coping strategies may effectively help to reduce depression symptoms (Carter, 2007) and the risk of poor physical HRQoL. Fortunately, trauma-informed mental health interventions targeting depression symptoms at primary care clinics have been found feasible and acceptable among Latinxs (Kaltman et al., 2016). Other clinical interventions that might be implemented to reduce depression symptoms and improve HRQoL in the context of perceived discrimination may include mindfulness approaches. For example, prior research finds that among a community-based sample, trait mindfulness reduced the deleterious effects of perceived discrimination and depression symptoms (Brown-Iannuzzi et al., 2014), and mindfulness-based stress reduction has been shown to improve HRQoL among a largely Hispanic population with significant mental health and medical diagnoses (Roth and Robbins, 2004).

Our findings also highlight the potential of health promotion programs that promote ethnic identity among Latinx adults to cope with stressful life events. Enhancing ethnic identity through critical race consciousness (Almeida et al., 2016) may deepen Latinxs' understanding of the relation between internalization of oppression and health while fostering civic engagement and activism as group-based coping strategies that can counteract potential health costs associated with perceived personal discrimination (cf. Cronin et al., 2012). Accordingly, the development of critical consciousness can provide opportunities for marginalized groups to learn how to identify when discriminatory experiences engender internalized racism while helping them "to label it as such so that it can be externalized, examined, and transformed" (Walters et al., 2016, p. S291). This raise in consciousness, supported by critical reflection and collective action to redress socially structured inequities, may hold potential promise for curtailing discrimination's damaging impact on the mental and physical health state of Latinxs.

6. Conclusion

This study contributes to a better understanding of the ways in which structural risk factors, i.e., different forms of perceived discrimination, are associated with the overall physical health of Latinxs. By 2050, Latinxs are expected to make up 30% of the U.S. populace compared to 14% in 2005 (Krogstad, 2016). The longer life expectancy at birth of Latinxs (vs. non-Hispanic Whites) suggests an overall health advantage (Arias, 2016); yet, longevity does not necessarily equate to favorable HRQoL. As such, the health status of Latinxs is a major public health concern and is increasingly important to the social and economic direction of our nation. Future research should further examine the processes by which perceived personal and group discrimination impact the health of Latinxs living in the U.S., a critical area of scientific inquiry with theoretical and societal import. This is particularly important because the current sociopolitical context including a proliferation of an anti-Latino/immigrant climate and policies, vitriolic public rhetoric, and race-related hate crimes and profiling (Stacey et al., 2011; Vargas et al., 2017), suggests that the burden of discrimination in the lives of Latinxs will continue. If discrimination as a structural force remains a normative experience for the youngest segment of our population, our findings suggest that it may have adverse effects on psychological health and physical HRQoL. At the national level, addressing the unjust burden of discrimination on physical HRQoL among Latinxs will require systemic changes. Meanwhile, at the local level, our findings highlight the potential of public health programs that seek to reduce depression symptoms and/or promote ethnic identity through empowerment strategies, such that participants develop strategies to voice and transform the social and institutional structures that perpetuate discrimination in all its forms.

7. Ethics approval

The Institutional Review Boards at each study site (University of North Carolina; University of Miami; Albert Einstein College of Medicine; University of Illinois at Chicago; Northwestern University; San Diego State University) approved all HCHS/SOL and HCHS/SOL Sociocultural Ancillary Study (SCAS) study procedures. Secondary data of HCHS/SOL and SCAS data are IRB exempt.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2018.12.038>

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Fig. 1.

Standardized Estimates of Hypothesized Model of the Relationships of Perceived Personal and Group Discrimination to Ethnic Identity, Depression Symptoms, and Physical Health-Related Quality of Life.

Notes. Analysis accounted for the complex survey design. Estimates are standardized.

Dashed lines represent non-significant paths. Path analyses adjusted for covariates. (Values in parentheses are INSERT.) $*p < .05$, $**p < .01$; $***p < .001$.

Fig. 2.

Standardized Estimates of Alternative Model of the Relationships of Perceived Personal and Group Discrimination to Ethnic Identity, Depression Symptoms, and Physical Health-Related Quality of Life.

Notes. Analysis accounted for the complex survey design. Estimates are standardized. Dashed lines represent non-significant paths. Path analyses adjusted for covariates. (Values in parentheses are INSERT.) $*p < .05$, $**p < .01$; $***p < .001$.

Table 1

HCHS/SOL SCAS sample demographic characteristics.

Characteristics	N	% or Mean (SD)
Age (years)	5313	42.48 (15.48)
Sex		
Female	3299	54.90
Male	2014	45.10
Hispanic/Latino Background		
Dominican	534	11.70
Central or South American	903	12.36
Cuban	775	20.32
Mexican	2080	36.55
Puerto Rican	880	15.76
Other Hispanic/Latino background	137	3.31
Education		
< High school	1923	32.52
High school diploma	1383	28.04
> High school	1998	39.44
Household Income		
< \$10,000	888	17.71
\$10,001-\$20,000	1673	33.64
\$20,001-\$40,000	1577	31.68
\$40,001-\$75,000	556	11.98
> \$75,000	178	5.00
Employment Status		
Not employed	2869	55.93
Employed	2384	44.07
Marital Status		
Single	1496	33.98
Married or living w/partner	2648	48.21
Separated, divorced, or widowed	1160	17.81
Health Insurance		
No	2579	47.75
Yes	2670	52.25
SASH Language Score	5306	2.10 (1.19)
Years living in U.S./Nativity		
U.S.-born	917	21.95
Foreign-born, < 5 years	587	13.38
Foreign-born, 5 but < 10 years	660	13.77
Foreign-born, 10 years	3138	50.90
Field Center		
Bronx	1342	30.23

Characteristics	N	% or Mean (SD)
Chicago	1329	15.63
Miami	1315	29.15
San Diego	1327	24.99

Note. N is unweighted; percentages, means, and standard deviations are weighted. Values in parenthesis are standard deviations (SD). SASH= Short Acculturation Scale for Hispanics.

Weighted means (M), standard deviations (SD), reliability (α), and zero-order bivariate correlations of variables in the path model: HCHS/SOL SCAS.

Table 2

Measure	M	SD	α	1	2	3	4	5
1. Personal Discrimination	25.13	8.91	0.88	–				
2. Group Discrimination	3.04	0.69	0.70	0.31***	–			
3. Ethnic Identity	3.66	0.51	0.70	0.02	0.08**	–		
4. Depression Symptoms	7.87	6.17	0.83	0.24***	0.06*	–0.04	–	
5. Physical HRQoL	49.65	9.94	0.89	–0.05*	–0.01	0.03	–0.15***	–

Note. HRQoL = Health-related quality of life.

* $p < .05$,

**

$p < .01$;

$p < .001$.