Short Communication

Associations between linguistic acculturation and skin cancer knowledge and beliefs among U.S. Hispanic adults

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ABSTRACT

The incidence of melanoma among U.S. Hispanics is rising and Hispanics have poorer melanoma survival compared to non-Hispanic whites. Acculturation has been linked with skin cancer-related behaviors among Hispanic individuals, such that Hispanic individuals who are more acculturated to U.S. norms and attitudes have been found to use sunscreen more frequently, to seek shade and use sun protective clothing less often, to sunbathe and indoor tan more frequently, and to have more sunburns than less acculturated individuals. However, little is known about factors that may account for the effect of acculturation on such behaviors and outcomes. The goal of this study was to examine the association between linguistic acculturation and skin cancer-related knowledge and beliefs among Hispanic adults. 788 Hispanic adults completed an online survey measuring linguistic acculturation, sun protection knowledge, perceived skin cancer risk, perceived severity, perceived worry, skin color preference, perceived suntan benefits, photo-aging concerns, sun protection norms, tanning norms and skin cancer fatalism. Compared with Spanish-acculturated Hispanics, English-acculturated Hispanics had greater knowledge, lower levels of perceived risk of skin cancer, lower perceived severity of skin cancer, less worry about skin cancer, greater perceived suntan benefits, and lower photo-aging concerns. This study highlights the importance of considering an individual's level of acculturation when designing skin cancer prevention interventions. Additional research is warranted to develop and test culturally relevant, tailored interventions to reduce the risks of skin cancer among U.S. Hispanics.

1. Introduction

By 2060, the proportion of the U.S. population that is Hispanic will increase from 17% to almost 30% (Colby and Ortman, 2014). Hispanic individuals trace their origins to Mexico, Cuba, Puerto Rico, South or Central America, or other Spanish cultures. There is a critical need to understand and address concomitant public health issues in this growing and often underserved population subgroup. Although the incidence of melanoma skin cancer is lower among Hispanics compared to non-Hispanic whites, incidence rates have increased in parallel in both groups in recent decades (Garnett et al., 2016). Moreover, Hispanics are more often diagnosed with melanoma at a younger age, with more advanced stage disease, and have poorer survival (Garnett et al., 2016). Among Hispanic individuals, acculturation—defined as the adoption of attitudes, norms, and behaviors from multiple cultures—has been linked with numerous health-related risk factors (Abraido-Lanza et al., 2016), including skin cancer-related behaviors (Andreeva et al., 2010; Boyas and Nahar, 2018; Coups et al., 2012; Coups et al.,

2013). Specifically, Hispanic individuals who are more acculturated to U.S. norms and attitudes have been found to use sunscreen more frequently, to seek shade and use sun protective clothing less often, to sunbathe and indoor tan more frequently, and to have more sunburns than less acculturated individuals (Andreeva et al., 2010; Boyas and Nahar, 2018; Coups et al., 2012; Coups et al., 2013). However, little is known about factors that may account for the effect of acculturation on such behaviors and outcomes. In order to provide insight on this issue, in the current study we examined the association between acculturation and a number of skin cancer-related knowledge and belief factors drawn from the Preventive Health Model (Myers et al., 1994) and the results of empirical studies of correlates of sun protection behaviors among Hispanic individuals (Boyas and Nahar, 2018; Coups et al., 2014). Understanding such associations may inform behavioral interventions to promote engagement in sun-safe behaviors among Hispanic individuals.

2. Methods

The study procedures, participants, and measures have been described elsewhere (Coups et al., 2013; Coups et al., 2014) and are summarized here.

2.1. Design and sample

Participants were recruited from KnowledgePanel Latino, a nationally representative online panel of U.S. Hispanic adults administered by the research company GfK Custom Research. Individuals were recruited to join KnowledgePanel Latino using a combined random digit dial and address-based sampling approach, which reaches up to 97% of U.S. Hispanic households. KnowledgePanel Latino panel members were eligible for the current study if they were 18 years or older, reported no personal history of skin cancer, and resided in Arizona, California, Florida, New Mexico or Texas. A total of 1717 panel members were randomly selected and emailed an invitation to complete an online survey. Of those, 25 were ineligible due to a personal history of skin cancer, 904 declined to participate, and 788 completed the survey (46.6% completion rate), 376 (47.7%) of whom completed it in Spanish. Participants provided informed consent and received $5 compensation for completing the study survey. This study received Institutional Review Board approval.

2.2. Measures

Participants reported their age, sex, level of education, and Hispanic heritage. Melanoma risk was assessed based on 8 risk factors (hair color; eye color; skin color; freckling; skin sensitivity to the sun; history of severe sunburns; presence of large moles; and family history of melanoma). Linguistic acculturation, defined as an individual's language use and preference, was assessed using the Language Use (e.g., "How often do you speak English?"; "How often do you speak Spanish?") and Linguistic Proficiency (e.g., "How well do you speak English?"; "How well do you speak Spanish?") subscales of the Bidimensional Acculturation Scale for Hispanics (Marin and Gamba, 1996). Following established scoring procedures, participants were denoted as being English-acculturated, Spanish-acculturated, or bicultural (Marin and Gamba, 1996).

Measures of skin cancer-related knowledge and beliefs were drawn from existing literature and were consistent with key health behavior theories, including the Preventive Health Model (Myers et al., 1994). Unless otherwise stated, measures used Likert-type response scales and an overall score was created for each multi-item measure by averaging responses to its respective items. The following constructs were assessed: *skin cancer knowledge* (Gillen et al., 2011; Manne et al., 2004) (8 items; number of correct responses summed); *perceived skin cancer risk* (Janssen et al., 2011) (2 items; α = 0.92); *perceived skin cancer severity* (Manne et al., 2004) (2 items; α = 0.86); *skin cancer worry* ("Health Information National Trends Survey (HINTS), n.d."; McCaul and Goetz, n.d.) (2 items; α = 0.81); *skin color preference* (Bond and Cash, 1992) (1 item: "If you could change your skin color, would you make it … much lighter, a little lighter, exactly the same, a little darker, much darker"); *perceived suntan benefits* (Jackson and Aiken, 2000) (6 items); *photoaging concerns* (Jackson and Aiken, 2000; Manne et al., 2011) (i.e., concerns about sun-related skin damage, including wrinkles and age spots; 3 items; α = 0.89); *sun protection descriptive norms* (Manne et al., 2004) (3 items); *tanning norms* (Manne et al., 2004) (4 items); and *skin cancer fatalism* (Health Information National Trends Survey (HINTS), n.d.) (1 item).

2.3. Analysis

We conducted analyses of variance to examine whether participants' number of melanoma risk factors, age, or education level differed

Table 1
Characteristics of the sample.

	Weighted %	Weighted mean (SD)
Female sex	49.6	
Age (years)		41.1 (15.0)
Educational level		
< High school graduate	34.3	
High school graduate	29.3	
Some college	25.0	
College graduate	11.5	
Hispanic heritage		
Mexican	70.9	
Puerto Rican	4.6	
Cuban	5.1	
Central American	6.1	
South American	6.7	
Other	6.6	
Number of melanoma risk factors		2.0 (1.4)
0	15.0	
1	27.3	
2	26.6	
3	16.0	
≥4	15.2	
Linguistic acculturation		
English-acculturated	19.5	
Bicultural	44.9	
Spanish-acculturated	35.6	

according to linguistic acculturation. Chi-square analysis was used to detect potential sex differences in linguistic acculturation. We conducted a series of univariable linear regression analyses with acculturation as a categorical independent variable and each of the skin cancer-related knowledge and belief variables as the dependent variable. In order to control for potential confounding variables, we conducted multivariable linear regression analyses with age, sex, education level, and the number of melanoma risk factors as additional independent variables. For all statistical analyses, the data were weighted using a variable that adjusted for several factors, including the probability of panel selection, Spanish language use, and potential post-stratification non-response and non-coverage biases. A cutoff of $p < .05$ was used to determine statistical significance.

3. Results

3.1. Demographics

Demographic characteristics (weighted percentages and means) are shown in Table 1. Study participants lived predominantly in California (45.3%) or Texas (31.1%) and reported being of Mexican heritage (70.9%). Participants were categorized as English-acculturated (19.5%), Spanish-acculturated (35.6%), or bicultural (44.9%).

There were some statistically significant variations in demographic variables by acculturation. English-acculturated participants were more likely to be male (61.5%) compared to those who were bicultural (51.4%) or Spanish-acculturated (42.8%; $p = .008$). Individuals' number of melanoma risk factors differed according to their linguistic acculturation ($F = 4.20$; $p = .02$). English-acculturated Hispanics had significantly more risk factors ($M = 2.2$) than those who were Spanish-acculturated ($M = 1.8$). English-acculturated Hispanics reported higher education levels ($F = 146.03$; $p < .001$) and were younger ($F = 2.95$; $p = .05$) than Spanish-acculturated Hispanics.

3.2. Univariable linear regression analyses examining associations between linguistic acculturation and skin cancer-related knowledge and beliefs

The results of the univariable linear regression analyses are shown in Table 2. Overall, participants had a mean score of 3.99 on the 8-item knowledge scale, with English-acculturated and bicultural individuals

Table 2

Association between linguistic acculturation and skin cancer-related knowledge and beliefs.

	Weighted Mean (SD)	Univariable β (p)	Multivariable β (p)
Knowledge			
English-acculturated	4.45 (1.77)	1.06 (< 0.001)	0.66 (0.002)
Bicultural	4.28 (1.88)	0.89 (< 0.001)	0.55 (< 0.001)
Spanish-acculturated	3.39 (1.86)	Ref. category	Ref. category
Perceived skin cancer risk			
English-acculturated	3.35 (0.90)	−0.52 (< 0.001)	−0.58 (< 0.001)
Bicultural	3.75 (1.03)	−0.12 (0.14)	−0.18 (0.06)
Spanish-acculturated	3.87 (1.18)	Ref. category	Ref. category
Perceived skin cancer severity			
English-acculturated	4.00 (0.86)	−0.28 (0.004)	−0.35 (0.002)
Bicultural	4.16 (0.85)	−0.11 (0.15)	−0.19 (0.03)
Spanish-acculturated	4.28 (1.13)	Ref. category	Ref. category
Worry about skin cancer			
English-acculturated	2.01 (0.91)	−1.02 (< 0.001)	−0.95 (< 0.001)
Bicultural	2.31 (1.03)	−0.71 (< 0.001)	−0.67 (< 0.001)
Spanish-acculturated	3.02 (1.21)	Ref. category	Ref. category
Skin cancer fatalism			
English-acculturated	2.14 (0.99)	−0.13 (0.27)	0.10 (0.46)
Bicultural	2.07 (1.11)	−0.20 (0.03)	−0.04 (0.68)
Spanish-acculturated	2.27 (1.33)	Ref. category	Ref. category
Photo-aging concerns			
English-acculturated	3.58 (0.83)	−0.14 (0.18)	−0.34 (0.005)
Bicultural	3.78 (0.96)	0.07 (0.40)	−0.10 (0.30)
Spanish-acculturated	3.71 (1.19)	Ref. category	Ref. category
Skin color preference			
English-acculturated	3.18 (0.84)	0.21 (0.05)	0.12 (0.35)
Bicultural	3.20 (1.03)	0.23 (0.01)	0.16 (0.10)
Spanish-acculturated	2.97 (1.19)	Ref. category	Ref. category
Perceived suntan benefits			
English-acculturated	2.97 (1.00)	0.61 (< 0.001)	0.50 (< 0.001)
Bicultural	2.59 (1.09)	0.22 (0.01)	0.17 (0.08)
Spanish-acculturated	2.36 (1.11)	Ref. category	Ref. category
Sun protection norms			
English-acculturated	3.20 (0.62)	−0.23 (0.01)	−0.16 (0.14)
Bicultural	3.35 (0.90)	−0.08 (0.26)	−0.06 (0.45)
Spanish-acculturated	3.43 (1.03)	Ref. category	Ref. category
Tanning norms			
English-acculturated	2.76 (0.62)	0.19 (0.04)	0.17 (0.10)
Bicultural	2.60 (0.89)	0.03 (0.71)	0.02 (0.83)
Spanish-acculturated	2.58 (1.94)	Ref. category	Ref. category

Note. Age, sex, education, and number of melanoma risk factors were included as covariates in the multivariable linear regression analyses. The 3-category linguistic acculturation variable was dummy coded and results in this table are from analyses with Spanish-acculturated coded as the reference category.

scoring higher than Spanish-acculturated individuals. Results for perceived skin cancer risk, severity, and worry were similar to each other, with higher values for each found among Spanish-acculturated compared to English-acculturated individuals. Levels of skin cancer fatalism were higher among bicultural compared to Spanish-acculturated individuals. Bicultural individuals reported preferring a darker skin color compared to Spanish-acculturated individuals. English-acculturated individuals and bicultural individuals reported higher perceived benefits of having a suntan compared to Spanish-acculturated individuals. With regard to norms, English-acculturated individuals reported low levels of sun protection norms and higher tanning norms than Spanish-acculturated individuals.

3.3. Multivariable linear regression analyses examining associations between linguistic acculturation and skin cancer-related knowledge and beliefs

The results of the multivariable linear regression analyses examining associations between acculturation and skin cancer-related knowledge and beliefs are shown in Table 2. After controlling for age, sex, education, and number of melanoma risk factors, linguistic acculturation remained significantly associated with knowledge, perceived risk, perceived severity, worry, and perceived suntan benefits. A significant difference emerged for photo-aging concerns, with those who were English-acculturated reporting lower concerns than those who were Spanish-acculturated. The statistically significant associations between linguistic acculturation and skin cancer fatalism, skin color preference, and sun protection and tanning norms that were found in the univariable analyses were not significant in the multivariable analyses.

4. Discussion

4.1. Summary

This study examined the association between linguistic acculturation and skin cancer-related knowledge and beliefs in a population-based sample of adult Hispanic individuals living in U.S. states with high UV sun exposure. Acculturation was associated with knowledge, perceived risk, perceived severity, worry, skin cancer fatalism, skin color preference, perceived suntan benefits, and sun protection and tanning norms, and many of these associations were retained after controlling for age, sex, education, and number of melanoma risk factors. In general, individuals who were English-acculturated had higher levels of knowledge and greater perceived suntan benefits but lower levels of perceived skin cancer risk, severity, worry, and photo-aging concerns. These findings may help to explain why English-acculturated Hispanics are less likely to seek shade and wear sun protective clothing when out in the sun (Andreeva et al., 2009) and are more likely to report sunbathing and indoor tanning. This suggests that as individuals become more acculturated to U.S. norms, they may develop less concern about the risk of skin cancer and engage in fewer sun-safe behaviors.

4.2. Limitations

The study sample was predominantly of Mexican heritage. Although this is consistent with national statistics, it limits the ability to example potential differences in correlates of acculturation between Hispanic heritage groups. The cross-sectional design of the study does not provide insight into the timing and nature of the acculturative processes that may influence Hispanic individuals' skin cancer-related knowledge and beliefs. Future research is needed to examine longitudinal changes in health-related beliefs that may be influenced by acculturation.

4.3. Conclusions

The results of the present study highlight the importance of considering an individual's level of acculturation when designing or disseminating skin cancer prevention interventions. For example, English-acculturated Hispanics may benefit more than Spanish-acculturated individuals from learning about the risks of skin cancer, whereas a focus on knowledge may be more appropriate for Spanish-acculturated Hispanics. The development and dissemination of culturally relevant and tailored behavioral interventions has the potential to reduce the risks of skin cancer among Hispanic adults in the United States.

Acknowledgements

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