

Financial Hardship Among Hispanic Women with Thyroid Cancer

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Background: Little is known about financial hardship among Hispanic women with thyroid cancer. The goal of this study was to determine the prevalence of financial hardship and to identify correlates of financial hardship in this understudied patient group.

Methods: We surveyed Hispanic women who had diagnoses of thyroid cancer reported to the Los Angeles Surveillance Epidemiology and End Results (SEER) registry in 2014–2015, and who had previously completed our thyroid cancer survey in 2017–2018 ($N=273$; 80% response rate). Acculturation was assessed with the Short Acculturation Scale for Hispanics (SASH). Patients were asked about three outcome measures since their thyroid cancer diagnosis: (i) financial status, (ii) insurance status, and (iii) material measures of financial hardship, collapsed into a single composite measure of financial hardship. We used multivariable logistic regression to identify correlates of financial hardship.

Results: Patients' median age at diagnosis was 47 years (range 20–79 years); 49% were low-acclimated and 47% reported financial hardship. Since their thyroid cancer diagnosis, 31% and 12% of the cohort reported being worse off regarding financial and insurance status, respectively. In multivariable analysis, high-acclimated older women were less likely to experience financial hardship compared with high-acclimated 20-year-old women. While financial hardship decreased with age for high-acclimated women ($p=0.002$), financial hardship remained elevated across all age groups for low-acclimated women ($p=0.54$).

Conclusions: Our findings suggest that across all age groups, low-acclimated Hispanic women with thyroid cancer are vulnerable to financial hardship, emphasizing the need for tailored patient-focused interventions.

Keywords: thyroid carcinoma, health care disparities, Hispanics, women, acculturation, financial burden

Introduction

THYROID CANCER IS THE second most commonly diagnosed cancer in Hispanic women in the United States, with an estimated 6800 new thyroid cancer cases among Hispanic women in 2018 (1). The incidence of thyroid cancer in Hispanic patients has increased over time; and although the thyroid cancer mortality rate has been stable, mortality from thyroid cancer is greater for Hispanic women than for non-Hispanic white women (1,2).

A pressing issue for many patients with thyroid cancer is the risk of financial hardship due to the substantial cost of thyroid cancer care in the United States (U.S.). In 2013, the estimated societal cost of thyroid cancer care for all U.S. patients diagnosed after 1985 was \$1.6 billion (3). Among cancer survivors, those with thyroid cancer more frequently

reported psychological financial hardship and were at higher risk of bankruptcy compared with those with colon, breast, lung, and prostate cancer (4,5). Furthermore, studies of cancer survivors in general have demonstrated that minority race/ethnicity is associated with greater cancer-related financial hardship (6–8). However, granular data on specific factors that contribute to financial hardship in patients of minority race/ethnicity are limited, partly due to the relatively small percentage of nonwhite patients in these prior studies. Thus, little is known about patient-reported financial hardship in a Hispanic cohort and how factors such as acculturation influence financial hardship.

Given the high prevalence of thyroid cancer in Hispanic women and the paucity of research focused on financial hardship in Hispanic women with thyroid cancer, the goal of this study was to determine the prevalence of financial

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hardship and to identify correlates of financial hardship in this understudied patient group. We hypothesized that low acculturation and younger age would be associated with higher likelihood of financial hardship.

Methods

Data source and study population

Between May 2, 2019 and December 31, 2019, we identified Hispanic women aged 18–79 years who had diagnoses of differentiated thyroid cancer reported to the Los Angeles Surveillance Epidemiology and End Results (SEER) registry between January 1, 2014 and December 31, 2015, and who had previously completed our patient survey on thyroid cancer in 2017–2018 ($N=273$; 80% response rate) (9–12). Similar to the methodology used in prior studies on Hispanic women, we surveyed female patients who completed our 2017–2018 thyroid cancer survey in Spanish or were identified in the SEER database as having a Spanish surname or being of Hispanic origin (13). To improve response rates, we provided a \$20 cash incentive and used a modified Dillman method, which included multiple reminders to nonresponders (14). Patients were mailed surveys in both English and Spanish, and bilingual interviewers conducted follow-up calls. Survey data were electronically entered using a double entry method to ensure <1% error. Survey responses were merged with clinical cancer data from the Los Angeles SEER registry to create a de-identified data set.

The study was approved by the institutional review boards of the University of Michigan and the University of Southern California, the California Committee for the Protection of Human Subjects, and the California Cancer Registry.

Survey questionnaire design and content

The survey instrument was developed based on the research questions and hypotheses, and prior work in other cancers (9–12,15–23). We utilized standard techniques to assess content validity, including review by clinicians and survey design experts, and pilot testing in a select cohort of Hispanic patients at the University of Michigan.

The English version of the survey was translated into Spanish using well-established translation procedures, with the goal of achieving cultural equivalence between the English and Spanish versions of the instruments (10–13,19). Procedures for achieving cultural equivalence included examining measures for content equivalence, semantic equivalence, technical equivalence, criteria equivalence, and conceptual equivalence.

Measures

Acculturation measure. We assessed acculturation with the Short Acculturation Scale for Hispanics (SASH) developed by Marin *et al.* (15). Patients were asked to indicate their language preference to the following five items: (i) In general, what language(s) do you read and speak? (ii) What was the language(s) you used as a child? (iii) What language(s) do you usually speak at home? (iv) In which language(s) do you usually think? and (v) What language(s) do you usually speak with your friends? Response categories were based on a five-point Likert scale from “only Spanish” to “only English.” A summary score (range 1–5) was

calculated by averaging responses from the individual items. Higher scores indicate a higher level of acculturation.

For our cohort of Hispanic women, the five-item SASH demonstrated excellent internal consistency, with a Cronbach’s alpha of 0.965. Given the ordinal nature of the SASH scale, a polychoric correlation matrix was constructed, which showed high inter-item correlations (all >0.71) and item-total correlations (all >0.78). Given the high correlation among the items, summary scores of patients who responded to four items ($N=8$) or all five items ($N=263$) of the SASH were included in the analysis. Similar to prior publications using the SASH, we used a cutoff of 2.99 to discriminate low-accultured respondents from high-accultured respondents (24–26).

Patient-reported financial hardship. To evaluate patients’ financial and insurance status since their thyroid cancer diagnosis, we adapted questions about financial burden used in the breast cancer literature (Supplementary Material) (17–19). Patients were asked whether they were worse off regarding their financial status and health insurance since their thyroid cancer diagnosis (yes/no for each). If patients answered “yes,” they were asked how much of this was due to their thyroid cancer and treatment (five-point Likert scale from “not at all” to “very much”).

To identify material measures of financial hardship, we adapted questions derived from the National Consumer Bankruptcy Project and used in the literature on other cancer types (Supplementary Material) (16,20–23). The core survey items were validated by Veenstra *et al.* in a population-based survey study of colorectal cancer patients, and previously used in five additional studies of breast and colorectal cancer patients, including more than 900 Hispanic cancer patients (18–23). Patients were asked whether, due to the financial impact of having thyroid cancer, they had to use savings; could not make payments on credit cards or other bills; cut down on spending for food; had their utilities turned off; or had to move out of their house or apartment because they could not afford to stay there (yes/no for each). We developed a single binary composite measure of financial hardship, defined as a “yes” response to any of these five individual material measures of financial hardship.

Covariates. We obtained the following patient-reported demographic characteristics: highest level of education, annual household income, health insurance, and comorbidities as detailed in our prior study (11). Clinical cancer characteristics obtained from the SEER registry were age at time of diagnosis (years), and combined clinical and pathological details which the SEER registry used to derive a stage variable following definitions from the American Joint Committee on Cancer 7th edition (AJCC-7) staging system (27).

Statistical analyses

We generated descriptive statistics for all categorical variables. We used Rao–Scott adjusted chi-square tests to evaluate for collinearity between variables and to test for a relationship between the composite measure of financial hardship and the following variables: age at time of diagnosis, highest level of education, annual household income, health insurance, level of acculturation, derived

AJCC-7 stage, number of comorbidities, and interaction between age and acculturation.

We used multivariable logistic regression analysis to determine factors associated with the composite measure of financial hardship. As part of the preliminary analyses to help us understand the relationships among our variables of interest, we performed Rao–Scott adjusted chi-square tests on age, income, and insurance. The tests showed a significant relationship among the variables ($p < 0.05$), consistent with previous established relationships between age and income, age and insurance, and income and insurance (28,29). Since there was collinearity among age, income, and insurance, and since age was most clinically relevant in prior work in thyroid and nonthyroid cancers (4–6,30), we only included the main effects of age, analyzed as a continuous variable, education, derived AJCC-7 stage, acculturation, and the interaction of age and acculturation in the statistical model. By including the interaction of age and acculturation, we allowed the model to have different effects of age for each of the acculturation group. To specify the comparison groups in the model, we centered age at diagnosis to the youngest age in our cohort and established the age of our reference group to be 20 years. We report adjusted odds ratios (OR) with 95% confidence intervals [CI] for all logistic regression models, with p -values < 0.05 considered statistically significant.

All statistical analyses incorporated nonresponse weights to reduce potential nonresponse bias. Analyses were performed using SAS 9.4 (SAS, Cary, NC) and Stata 15.1 (StataCorp LLC, College Station, TX).

Results

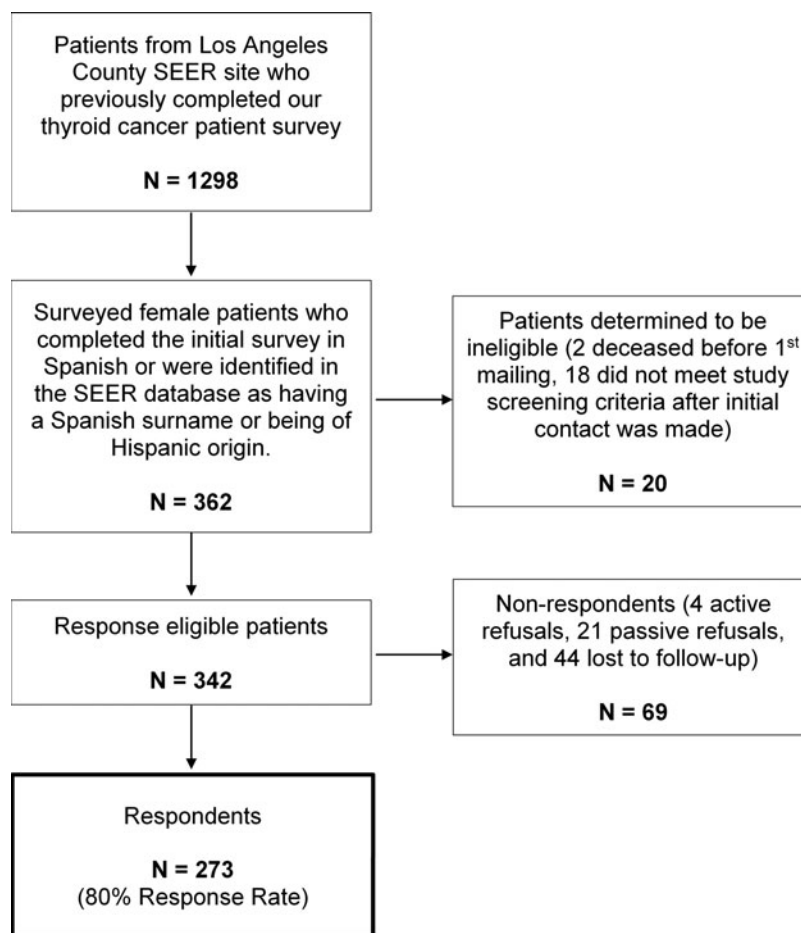
Characteristics of study cohort

Of the 362 patients identified and mailed a survey, 342 were determined to be eligible. A total of 273 patients responded, yielding an 80% response rate (Fig. 1). Patients' median age at time of diagnosis was 47 years (range 20–79 years), with 74.6% ($N=203$) of Mexican origin, 48.7% ($N=135$) of low acculturation, and 46.5% ($N=125$) with report of financial hardship as determined by the composite measure. There was no significant difference in receipt of total thyroidectomy versus lobectomy, or receipt of radioactive iodine therapy between low- and high-acculturated Hispanic women ($p=0.40$ and $p=0.45$, respectively).

Patient perception of financial hardship

Figure 2 shows the patients who reported worse financial status and health insurance due to their thyroid cancer and treatment. Since their thyroid cancer diagnosis, 30.5% ($N=81$) of the cohort endorsed being worse off regarding financial status, with 19.2% ($N=51$) attributing a little/somewhat and 11.2% ($N=30$) attributing quite a bit/very much of this due to their thyroid cancer and treatment. Regarding health insurance, 12.2% ($N=34$) of the cohort endorsed being worse off, with 5.0% ($N=14$) attributing a little/somewhat and 7.2% ($N=20$) attributing quite a bit/very much of this due to their thyroid cancer and treatment.

FIG. 1. Flow diagram of survey respondents ($N=273$, 80% response rate). SEER indicates Surveillance, Epidemiology, and End Results program.



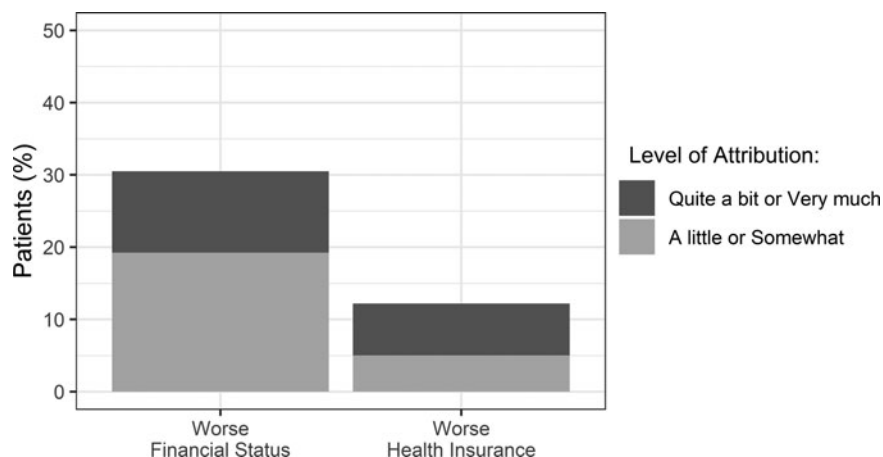


FIG. 2. Patient report of worse financial and health insurance status since their thyroid cancer diagnosis. Distribution of patients who attributed a little/somewhat or quite a bit/very much of this change due to their thyroid cancer and treatment.

Patient report of material measures of financial hardship

Figure 3 illustrates the distribution of patients who endorsed individual material measures of financial hardship due to thyroid cancer. In the cohort, 38.0% (N=99) had to use savings, 24.6% (N=63) cut down on spending for food, 17.7% (N=44) could not make payments on credit cards or other bills, 5.2% (N=14) had to move out of their house or apartment because they could not afford to stay there, and 2.7% (N=7) had their utilities turned off because the bill was not paid.

Factors associated with composite measure of financial hardship

Table 1 displays the demographic and clinical characteristics of respondents by composite measure of financial hardship (defined as a “yes” response to any of the five individual material measures of financial hardship). Reported annual household income and health insurance were associated with composite measure of financial hardship (both $p < 0.05$). To account for the higher percentage of younger individuals with no or minimal savings (31–33), we performed a sensitivity analysis excluding the individual measure of “I had to use savings” from the composite measure of financial hardship (new total of 85 patients, or 31.7% of

the cohort with report of financial hardship). This sensitivity analysis demonstrated that reported annual household income and younger age at diagnosis (both $p < 0.05$), but not health insurance ($p = 0.08$), correlated with the composite measure of financial hardship.

Figure 4 demonstrates the impact of age and acculturation on composite measure of financial hardship. For Hispanic women with high acculturation, financial hardship decreased with older age ($p = 0.002$). However, for Hispanic women with low acculturation, financial hardship remained elevated across all age groups ($p = 0.54$).

Table 2 shows factors associated with the composite measure of financial hardship. After adjustment for education, stage, and level of acculturation, high-accultured older women had lower odds of financial hardship (OR 0.93 [CI 0.90–0.97]) compared with high-accultured 20-year-old women. Low-accultured older women, however, had similar odds of financial hardship (OR 0.98 [CI 0.95–1.01]) compared with high-accultured 20-year-old women. Sensitivity analysis excluding the individual measure “I had to use savings” from the composite measure of financial hardship yielded similar results: high-accultured, but not low-accultured, older women had lower odds of financial hardship (high-accultured older women: OR 0.94 [CI 0.91–0.97]; low-accultured older women: OR 0.98 [CI 0.95–1.01]) compared with high-accultured 20-year-old women.

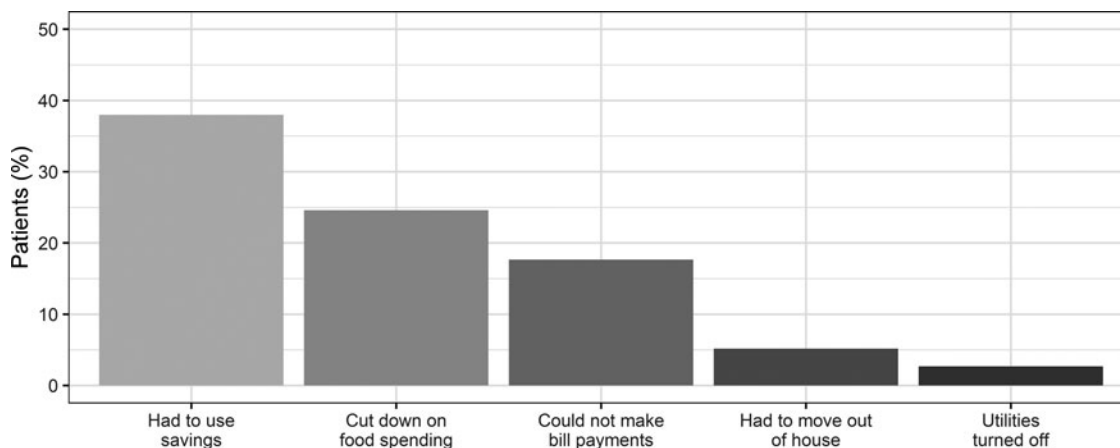


FIG. 3. Patient report of material measures of financial hardship due to having thyroid cancer. In the cohort, 38.0% (N=99) had to use their savings and 2.7% (N=7) had their utilities turned off because the bill was not paid.

TABLE 1. DISTRIBUTION OF PATIENT DEMOGRAPHIC AND CLINICAL CHARACTERISTICS BY COMPOSITE MEASURE OF FINANCIAL HARDSHIP (N=273)

| Characteristic ^a | All patients (N=273), n (%) | No financial hardship (N=148), n (%) | Endorsed financial hardship ^b (N=125), n (%) | p ^c |
|-------------------------------|--------------------------------|---|--|----------------|
| Age at diagnosis (years) | | | | 0.08 |
| 20–39 | 88 (34.3) | 41 (46.2) | 47 (53.8) | |
| 40–49 | 68 (24.0) | 34 (50.2) | 34 (49.8) | |
| 50–64 | 82 (30.3) | 48 (57.5) | 34 (42.5) | |
| 65–79 | 35 (11.4) | 25 (71.3) | 10 (28.7) | |
| Highest level of education | | | | 0.55 |
| High school diploma and below | 140 (52.1) | 79 (55.4) | 61 (44.6) | |
| Some college | 71 (27.3) | 37 (52.4) | 34 (47.6) | |
| College degree and above | 54 (20.6) | 26 (46.7) | 28 (53.3) | |
| Annual household income | | | | 0.004 |
| ≤\$49,000 | 121 (43.8) | 52 (41.9) | 69 (58.1) | |
| >\$49,000 | 76 (28.4) | 47 (61.8) | 29 (38.2) | |
| Missing value | 76 (27.8) | 49 (63.2) | 27 (36.8) | |
| Health insurance | | | | 0.04 |
| Private insurance | 129 (50.1) | 64 (49.5) | 65 (50.5) | |
| Medicare | 55 (19.5) | 38 (68.9) | 17 (31.1) | |
| Other ^d | 79 (30.4) | 39 (48.2) | 40 (51.8) | |
| Level of acculturation | | | | 0.33 |
| Low acculturation | 135 (48.7) | 70 (50.4) | 65 (49.6) | |
| High acculturation | 136 (51.3) | 77 (56.5) | 59 (43.5) | |
| Derived AJCC-7 stage | | | | 0.69 |
| Stage I/II | 192 (72.7) | 105 (53.8) | 87 (46.2) | |
| Stage III/IV | 75 (27.3) | 39 (51.1) | 36 (48.9) | |
| No. of comorbidities | | | | 0.98 |
| 0 | 174 (64.6) | 95 (53.3) | 79 (46.7) | |
| 1 | 68 (24.6) | 36 (53.3) | 32 (46.7) | |
| ≥2 | 31 (10.8) | 17 (55.1) | 14 (44.9) | |

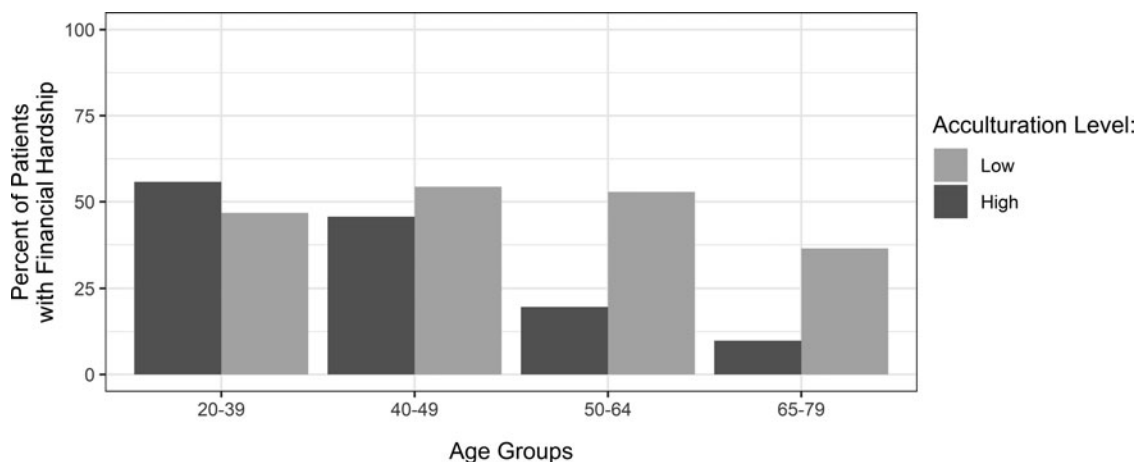
^aPercentages are calculated based on the responders.

^bThe composite measure of financial hardship is defined as a “yes” response to any of the five individual material measures of financial hardship: I had to use savings; I could not make payments on credit cards or other bills; I cut down on spending for food; I had my utilities turned off because the bill was not paid; or I had to move out of my house or apartment because I could not afford to stay there.

^cp-Values are derived from Rao–Scott adjusted chi-square tests.

^dOther health insurance includes insurance purchased from an exchange; Medicaid or other state provided insurance; Veteran Affairs health care; or self-pay.

AJCC-7, American Joint Committee on Cancer 7th edition.



Chi-square test for age and financial hardship: Low acculturation women p=0.54, and High acculturation women p=0.002.

FIG. 4. The influence of age and level of acculturation on financial hardship in Hispanic women. While financial hardship decreased with age for high-acculturated women ($p=0.002$), financial hardship remained elevated across all age groups for low-acculturated women ($p=0.54$).

TABLE 2. MULTIVARIABLE ADJUSTED ODDS RATIOS AND 95% CONFIDENCE INTERVALS OF PATIENT CHARACTERISTICS ASSOCIATED WITH COMPOSITE MEASURE OF FINANCIAL HARDSHIP AMONG HISPANIC WOMEN WITH THYROID CANCER

| | OR [CI] |
|---|------------------|
| Highest level of education | |
| High school diploma and below | 0.73 [0.33–1.61] |
| Some college | 0.81 [0.38–1.71] |
| College degree and above | Reference |
| Derived AJCC-7 stage | |
| Stage I/II | Reference |
| Stage III/IV | 1.80 [0.94–3.44] |
| Level of acculturation | |
| Low acculturation | 0.60 [0.17–2.13] |
| High acculturation | Reference |
| Effect of age by acculturation ^a | |
| Age for low-acculturated women | 0.98 [0.95–1.01] |
| Age for high-acculturated women | 0.93 [0.90–0.97] |

Reference categories: college degree and above (highest level of education), stage I/II (derived AJCC-7 stage), high acculturation (level of acculturation), high-acculturated 20-year-old (effect of age by acculturation).

^aAge is analyzed as a continuous variable in the statistical model. Therefore, the OR for “effect of age by acculturation” represents the OR for an increase of one year in age.

CI, 95% confidence interval; OR, odds ratio.

Similarly, when we excluded cancer stage, which exhibited collinearity with age ($p < 0.05$), as a covariate in the model, high-acculturated, but not low-acculturated, older women had lower odds of financial hardship (high-acculturated older women: OR 0.94 [CI 0.91–0.97]; low-acculturated older women: OR 0.99 [CI 0.96–1.02]) compared with high-acculturated 20-year-old women. Education and stage were not associated with the composite measure of financial hardship in the multivariable model.

Discussion

Our study, which to our knowledge is the first population-based survey study to examine financial hardship in a cohort of Hispanic women with thyroid cancer, provides novel insights into the relationship between acculturation, age, and financial hardship in this understudied patient group. Our findings in women with high acculturation mirror prior studies, with younger age associated with greater financial hardship (4–6,30). However, unique from prior studies and for the first time, we found that in women with low acculturation, financial hardship remained elevated across all age groups. That is, older women with low acculturation had similar susceptibility to financial hardship as did younger women.

Consistent with studies of patients with other malignancies, we found that income was associated with financial hardship. In a prospective study of patients with head and neck cancers, Beeler *et al.* showed that lower median household income (less than \$50,000 per year) by county was associated with worse financial burden (30). Additionally, Han *et al.* found that among cancer survivors, lower family income was associated with greater financial hardship (8). Similarly, Huang *et al.* demonstrated that among adult sur-

vivors of childhood cancer, annual household income of \$39,999 or less, compared with \$80,000 or more, increased risk of financial hardship (34). In contrast to these prior nonthyroid cancer studies in which the majority of the cohort were non-Hispanic white patients, our study examined financial hardship in a cohort of Hispanic women with thyroid cancer.

The observed differences in Hispanic women’s susceptibility to financial hardship based on their level of acculturation are unlikely to be due to differences in thyroid cancer treatment but may be a result of disparities in income, employer-sponsored retirement plans, and social security benefits. In 2013, median earnings for foreign-born Hispanic women aged 25–64 years who were employed full-time were \$23,400 compared with \$35,600 for U.S.-born Hispanic women and \$41,700 for non-Hispanic white women (35). The lower earning potential of foreign-born Hispanic women may partly be due to employment barriers for women with limited English proficiency (35,36). In 2014, among employed foreign-born Hispanic women aged 25–64 years, 26% worked in food prep, building and grounds cleaning, and personal care; 15% in office and administrative support; and 9% in management, business operations, and finance. This was compared with the 9%, 27%, and 17% of employed U.S.-born Hispanic women who worked in these occupations, respectively (35). Furthermore, full-time Hispanic women employees aged 25–64 years were less likely to participate in an employer-sponsored retirement plan (30% of foreign-born Hispanic women and 46% of U.S.-born Hispanic women) compared with their non-Hispanic white counterparts (57%) (35). The financial impact of these shortcomings in earnings and workplace retirement plans is compounded when individuals apply for social security benefits, which require at least 10 years of employment to qualify. In 2013, only 75% of Hispanic adults aged 65 years and older received social security benefits compared with almost 90% of non-Hispanic white adults. Unfortunately, even among recipients aged 65 years and older, there is income inequality such that the median 2013 social security income for foreign-born Hispanic recipients was \$9100 compared with \$11,600 for U.S.-born Hispanic recipients and \$14,200 for non-Hispanic white recipients (35).

Hispanic women with thyroid cancer are an underrepresented and understudied patient population, thus studies such as this one are needed to improve the depth of thyroid cancer disparities research (37). While our study has several strengths, including a high response rate among surveyed patients, focus on an understudied patient population, and use of the validated SASH to assess acculturation, it also has limitations. First, there may be other aspects of cancer-related financial hardship that were not assessed. However, the individual measures of financial hardship used in our survey were adapted from the Consumer Bankruptcy Project, which provides free legal assistance to low-income consumers with outstanding debts (16), and are measures that have previously been used to study financial hardship in more than 4000 patients with colorectal and breast cancer, including more than 900 Hispanic patients (18–23). Second, our cohort was restricted to Hispanic women with thyroid cancer from the Los Angeles County (predominantly Mexican and Central American origin), and thus, findings may not be generalizable to Latinas with origins from the Caribbean or South America.

Third, patients were not asked about out-of-pocket cancer-related expenses or about social security benefits, information that could provide insight into financial hardship among low-acculturated Hispanic women.

Our study highlights the unique vulnerability of low-acculturated Hispanic women and their need for patient-focused interventions to address cancer-related financial hardships. Such financial hardships have negative consequences on patients' mental and physical health with patients at increased risk for anxiety and depression, and some patients choosing to forgo prescription medications or delay medical care as a result (6,38,39). Identification of patients at risk for cancer-related financial hardship followed by meetings with financial counselors may be beneficial in helping patients to mitigate out-of-pocket expenses and access information about financial assistance programs. Psychosocial interventions may also be necessary to address any psychological distress that patients may develop as a result of their financial difficulties. Furthermore, these interventions will need to be tailored to the unique needs of low-acculturated Hispanic women. Specifically, it will be important to involve bilingual staff, have resources available in both English and Spanish, utilize social media platforms (40), be accessible outside traditional office hours for patients with limited flexibility for time off work, and/or offer virtual visits through video/telephone communication for patients who would otherwise need to travel long distances.

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Author Disclosure Statement

No competing financial interests exist.

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Supplementary Material

Supplementary Material

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