

Predictors of psychological outcomes in a longitudinal study of Latina breast cancer survivors

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(Received 11 December 2015; accepted 28 June 2016)

Objective: This study sought to investigate the unique contributions of socio-ecological, cultural and cancer treatment-related factors in predicting depressive symptoms and cancer-specific distress among Latinas. Design: Participants were 140 English or Spanish-speaking Latinas ($M_{\text{age}} = 50.6$) with non-metastatic breast cancer who were assessed within two years of diagnosis (Time 1) and three months later (Time 2).

Main Measures: Hierarchical regression analyses identified predictors of depressive symptoms and cancer-specific distress at Time 1 and 2.

Results: Most women scored above the clinical cut-offs for depressive symptoms and cancer-specific distress. After adjusting for socio-ecological factors, greater Latino enculturation, measured by Latino ethnic identity, was significantly associated with greater cancer-specific distress at Time 1 ($\beta = .20$, $p < .05$). A significant interaction ($p < .01$) revealed that among women high on Latino identity, lower English language use was associated with more cancer-specific distress than higher English language use. After adjusting for socio-ecological factors, greater satisfaction with surgical treatment predicted improved depressive symptoms and cancer-specific distress across time (β_s range from $-.31$ to $-.18$, $p_s < .01$).

Conclusions: Findings elucidate the complex relationship between culture and psychological outcomes in the breast cancer context and suggest that treatment satisfaction might be an important intervention target for Latinas.

Keywords: Latina; breast cancer; acculturation; psychosocial; distress; treatment satisfaction

Introduction

Approximately 35% of Latina women living in the US will be diagnosed with cancer in their lifetime, with breast cancer being the most commonly diagnosed cancer among Latinas (American Cancer Society, 2012). For many women, undergoing a breast cancer diagnosis and treatment is a stressful and life-altering experience. In particular, Latina breast cancer survivors are more likely to report poor psychological outcomes, such as depressive symptoms, relative to non-Latina Whites (NLWs) (Graves et al., 2012; Yanez, Thompson, & Stanton, 2011). However, few studies have focused on

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establishing contributors to psychological outcomes across time among Latina breast cancer survivors, which is the goal of this study.

In order to better understand determinants of psychological outcomes among Latina breast cancer survivors, we drew from previously established models such as the Reserve Capacity Model (Gallo & Matthews, 2003) and the Lifespan Biopsychosocial Model of Cumulative Vulnerability and Minority Health (Myers, 2009). Both of these models posit that low socio-economic status may confer risk for poor health outcomes as a result of access to fewer social and economic resources. Both models also posit that low socio-economic status reduces an individual's capacity to cope with stress, ultimately leading to poorer health outcomes. The Cumulative Vulnerability and Minority Health Model extends the Reserve Capacity Model by specifically positing that racial/ethnic minority individuals are at risk for increased stress due to the combination of minority status and limited socio-economic resources (Myers, 2009). The combined effect of minority status and low socio-economic status may limit access to interpersonal, community, cultural and health care resources that are useful when coping with stressful life events such as cancer (Myers, 2009). Taken together, these models underscore the importance of assessing social, cultural and ecological factors as determinants of psychological outcomes in the cancer context.

Socio-ecological factors represent interpersonal, community and societal factors. Experiencing ongoing, chronic stressors (e.g. ongoing financial strain or housing problems) and the perception of low social status are two ways in which ethnic minorities may be negatively affected by socio-ecological factors. Ongoing or chronic stress and low perceived social status have been related to poorer self-reported health and poorer psychological functioning in the cancer context (Bellizzi & Blank, 2006; Stanton, Revenson, & Tennen, 2007; Wittenberg et al., 2010; Wolff, Subramanian, Acevedo-Garcia, Weber, & Kawachi, 2010), especially among racial/ethnic minorities (Matthews & Gallo, 2011; Myers, 2009). Therefore, when considering possible contributors to psychological outcomes, it is important to assess the role of socio-ecological factors.

In addition to socio-ecological factors, cultural factors may influence the cancer survivorship experience outcomes (American Cancer Society, 2012) and factors such as acculturation and enculturation likely shape psychological outcomes. Acculturation refers to the multidimensional processes of adapting to the host majority culture (Berry, 1997). Enculturation refers to maintaining an individual's culture of origin while living in another culture (Gonzales, Knight, Morgan-Lopez, Saenz, & Sirolli, 2002). The extent to which acculturation and enculturation are associated with outcomes such as depressive symptoms and cancer-specific distress during cancer survivorship is not well understood, and the associations among these cultural processes and psychological outcomes may be complex (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Greater acculturation may signify English proficiency and a better understanding of aspects of living in the US such as navigating the US health care system. In contrast, greater enculturation may signify use of Spanish and retention of Latino ethnic identity. Strong Latino ethnic identity may reflect retention of traditional Latino values and beliefs, including illness perceptions about cancer such as stigma or fatalistic beliefs (Ashing-Giwa, Padilla, Bohorquez, Tejero, & Garcia, 2006; Lopez-Class, Gomez-Duarte, Graves, & Ashing-Giwa, 2012). Previous studies focusing on Latinos have generally assessed one dimension of acculturation, which does not fully capture the bi-linear processes of acculturation and enculturation and their unique contribution to psychological outcomes after cancer treatment.

Latinas, especially recently immigrated Latinas, may have difficulty in navigating the US health care system and communicating with health care providers due to logistical constraints, lack of familiarity with the health care system and potential language barriers. Therefore, it is not surprising that Latinas report having more unmet needs regarding information and psychological support after completion of primary treatment for cancer compared to African-Americans and NLWs (Ashing-Giwa et al., 2006; Moadel, Morgan, & Dutcher, 2007). More specifically, Latinas receive less cancer treatment information than they desire (Janz et al., 2008; Maly, Leake, & Silliman, 2003) and may have greater difficulty understanding cancer-related written materials compared non-Latina whites (Janz et al., 2008). Latinas have also reported more treatment decision regret (Hawley, Fagerlin, Janz, & Katz, 2008; Maly, Umezawa, Ratliff, & Leake, 2006), and dissatisfaction with cancer treatment (Hawley et al., 2008) relative to NLWs. Latinas who are satisfied with their treatment and who are able to communicate effectively with their providers evidence better quality of life after breast cancer (Chen, Diamant, Thind, & Maly, 2008; Maly, Stein, Umezawa, Leake, & Anglin, 2008; Yanez, Stanton, & Maly, 2012). These findings from the literature suggest that treatment satisfaction and patient-provider communication are two important factors specific to cancer treatment that may be predictors of psychological outcomes among Latina survivors.

Because psychological outcomes such as depressive symptoms and distress are linked to lower adherence with follow-up care and have also been associated with recurrence and mortality (Fann et al., 2008; Pinquart & Duberstein, 2010; Satin, Linden, & Phillips, 2009), it is critical that studies target psychological outcomes in cancer survivorship. Three domains are likely relevant to psychological outcomes among Latinas: socio-ecological factors (i.e. social status and chronic stressors), cultural factors (i.e. enculturation and acculturation) and treatment-related factors (i.e. self-efficacy in patient-physician communication and treatment satisfaction). However, the majority of studies on determinants of psychological outcomes after breast cancer for Latinas are cross-sectional, limiting our understanding of determinants of change (Ashing-Giwa, Rosales, Lai, & Weitzel, 2013; Graves et al., 2012; Janz et al., 2009; Yanez et al., 2011). This study sought to establish the unique contribution of these three domains in predicting depressive symptoms and cancer-specific distress at study entry and three months later. After adjusting for socio-ecological factors and relevant covariates, we hypothesised that greater acculturation would be related to improved psychological outcomes, whereas greater enculturation would be related to worse outcomes. Finally, we hypothesised that factors specific to treatment such as greater self-efficacy in patient-physician communication and treatment satisfaction would be related to improved psychological outcomes over and above the contribution of socio-ecological and cultural factors.

Methods

Participants

Upon IRB approval, participants were recruited from a safety net hospital affiliated with UCLA (Olive View – UCLA Medical Center) and from the Dr. Susan Love Army of Women website. Eligibility included self-identification as Latina and receipt of a non-metastatic breast cancer diagnosis within the past 24 months. Of the 169 eligible women who enrolled in the study, 140 completed the Time 1 (baseline) assessment and

122 completed the Time 2 assessment. All patients were enrolled in an active breast cancer navigation programme for the first year of treatment through the Avon Care for Life Programme at Olive View – UCLA Medical Center, which includes one-on-one care coordination with a bilingual patient navigator during active treatment.

Procedure

Latina breast cancer patients completed standardised assessments via phone interview at 2 time points: within 24 months of diagnosis (Time 1) and 3 months after the initial assessment (Time 2). Most women (88%) chose to be interviewed in Spanish. Unless otherwise stated, scales were forward translated and then back translated by doctoral-level graduate students at the UCLA Spanish Department. Study outcomes were assessed across both time points. All predictors and covariates were assessed at Time 1 with the exception of treatment satisfaction. Treatment satisfaction was administered at Time 2 instead of Time 1 to provide additional time for women to heal and recover from their surgery before assessing satisfaction with their surgical treatment. Women were compensated \$35 for their participation.

Measures

Socio-Ecological Factors

Subjective social status. Administered at Time 1, the MacArthur Scale of subjective social status contains one question that measures perceptions of social stratification (Adler, Epel, Castellazzo, & Ickovics, 2000). This scale uses a ladder (0–10 rungs), with higher scores indicating higher perceived rank, to assess perceptions of status relative to the US population. Because administration of the measures took place by phone, women were instructed to visualise a ladder with 10 rungs. They were then read the instructions of the scale and asked to indicate which of the 10 rungs, with 1 being the rung closest to the bottom and 10 being the highest rung, in which they would place themselves.

Chronic stressors. Measured at Time 1, chronic stressors were operationalised as events occurring in the lives of the participants that endured for 12 months or more and were perceived as very stressful (e.g. health problems in a close relative or friend, difficulties with a job or ability to work) (Troxel, Matthews, Bromberger, & Sutton-Tyrrell, 2003). Nine items were rated on a scale ranging from not very upsetting to very upsetting (Troxel et al., 2003). The scale is dichotomous such that participants who indicated at least one ongoing stressor as being ‘very upsetting’ were coded as having a chronic stressor (1), whereas participants who rated the items as ‘not very upsetting’, ‘moderately upsetting’ or not endorsing any ongoing problems were defined as having no chronic stressors (0) (Troxel et al., 2003).

Cultural Factors

Acculturation and enculturation. Acculturation and enculturation were measured at Time 1 with the Abbreviated Multi-Dimensional Acculturation Scale (AMAS-ZABB). The AMAS-ZABB is a measure that is bilinear (i.e. measures acculturation and

enculturation), multidimensional (e.g. knowledge, identity and language), and may be used across ethnic groups. Four subscales were used in this study: Spanish language, Latino identity, English language and American identity (Zea, Asner-Self, Birman, & Buki, 2003). The 30 items are rated on a scale from one (strongly disagree, or not at all) to four (strongly agree, or extremely well), with higher scores representing a higher level of acculturation or enculturation. A sample item includes 'being (member of my culture of origin) plays an important part in my life'. Internal consistencies for the subscales were high (α_s ranged from .86–.97).

Factors specific to cancer treatment

Efficacy in patient–physician communication. Administered at Time 1, the Perceived Efficacy in Patient–Physician Interactions Questionnaire (PEPPI) contains five items that describe patients' confidence in their ability to communicate with physicians and obtain needed attention to chief medical concerns (e.g. 'How confident are you in your ability to get a doctor to answer all of your questions') (Stanton et al., 1998). High scores (range = 0–50) reflect higher perceived self-efficacy in communication. The internal consistency reliability coefficient was $\alpha = .85$.

Treatment satisfaction. Treatment satisfaction was measured at Time 2 using two subscales of the Breast Cancer Decision-Making Questionnaire (Stanton et al., 1998), which assesses perceived satisfaction with self-evaluation regarding breast cancer surgery and satisfaction with surgical treatment in curing their disease. The satisfaction with self-evaluation subscale includes three items: physical appearance, sense of femininity and sense of sexuality. The satisfaction with perception of being cured subscale includes two items: cure and recurrence. Women rated their surgical satisfaction (e.g. 'To what extent does the surgery have a negative effect on your sense of femininity') ranging from no negative effect (1) to extremely negative effect (7). Higher values indicated greater satisfaction. Internal consistency for the satisfaction with self-evaluation subscale was good ($\alpha = .88$) and for the satisfaction with treatment in curing their disease acceptable ($\alpha = .69$).

Outcomes

Cancer-specific distress. Cancer-specific psychological distress was measured at Time 1 and Time 2 with the 15-item Impact of Event Scale (IES) (Weiss & Marmar, 1997). Participants rated their level of distress for each item (with respect to their cancer) during the past 7 days using a scale ranging from 'Not at all' to 'Often'. The IES consists of two subscales: Intrusion and Avoidance. The measure also yields a composite score that ranges from 0 to 75, where a higher score indicates greater distress. The suggested clinical cut-off for the IES is a score of 27. The current study used the composite score of the IES. Internal consistency was good $\alpha = .87$ at Time 1 and $.89$ at Time 2. A previously validated Spanish version was used for Spanish-speaking participants (Baguena et al., 2001).

Depressive symptoms. The 20-item Center for Epidemiologic Studies-Depression Scale (CES-D) was completed at both assessments to assess frequency of depressive

symptoms during the past week (Radloff, 1977). Response options ranged from 0 'rarely or none of the time' to 3 'most of the time'. The suggested clinical cut-off for the CES-D is a score of 16. Internal consistency was good in this sample ($\alpha = .93$ at Time 1 and $\alpha = .94$ at Time 2). A previously validated Spanish version was used for Spanish-speaking participants (Golding & Aneshensel, 1989).

Covariates

Demographic, medical and cancer-related variables. Demographic variables assessed at Time 1 were age, education, employment, combined household income, insurance status and nativity. Cancer-related variables assessed via self-report at Time 1 were time since diagnosis, time since surgery, cancer stage, previous cancer diagnosis, type of surgery, comorbid medical diagnoses and adjuvant treatments received.

Analytic strategy

To adjust for possible confounds, one-way analyses of variance (ANOVA) and correlations were conducted to determine whether demographic and medical variables (i.e. age, income, education, recruitment site, surgery type, adjuvant treatment, time since diagnosis, time since surgery, health insurance status, comorbid medical conditions and previous diagnosis of cancer) were significantly associated with cancer-specific distress or depressive symptoms. Any potential covariates significant at $p < .10$ were included in regression model.

Four hierarchical regression analyses were performed to determine the influence of variables of interest on depressive symptoms and cancer-specific distress. The first two regression analyses were conducted on each of the dependent variables at Time 1. Socio-ecological variables were entered in Step 1 and medical covariates in Step 2. Enculturation variables were entered in Step 3 and acculturation variables were entered in Step 4. Efficacy in patient-physician communication was entered in Step 5. Treatment satisfaction variables were not included because they were assessed at Time 2 only. The next two hierarchical regression models predicted change in the dependent variables over time, with the addition of the Time 1 relevant dependent variable entered as Step 1 and treatment satisfaction variables entered in the final step. The order of variable entry allowed us to evaluate the contributions of the socio-ecological and medical covariates prior to testing the influence of the cultural variables, as well as the self-efficacy and treatment satisfaction. Missing data for longitudinal analyses were analysed in two ways: listwise deletion and mean substitution. Because there were no significant differences in the results from either analytic approach, we only present the results from listwise deletion approach. Preliminary analyses were conducted to rule out multicollinearity by examining the associations among independent variables. Analyses were conducted using SPSS 18.0 (SPSS, Inc, Chicago, IL).

Results

Descriptive statistics

Sample characteristics ($N = 140$) are displayed in Table 1. Descriptive statistics for study variables are summarised in Table 2. Normal distributions were evidenced for

Table 1. Sample characteristics ($N = 140$).

Age in years, mean (SD)	50.62	(9.65)
Months since diagnosis, mean (SD)	6.28	(5.13)
Months since surgery, mean (SD)	3.26	(4.68)
<i>Country of origin, % (n)</i>		
Mexico	49	(68)
Central America	31	(43)
South America	6	(9)
United States	11	(16)
Other (e.g. Cuban)	3	(4)
<i>Household income, % (n)</i>		
Less than \$10,000	38	(40)
\$10,000 to \$19,999	29	(26)
\$20,000 and \$39,999	19	(12)
Above \$40,000	9	(9)
Declined to report	6	
<i>Insurance, % (n)</i>		
Private	9	(13)
Medicaid/medi-cal	86	(120)
Medicare	2	(3)
None	3	(4)
<i>Educational history, % (n)</i>		
Less than high school	45	(63)
Completed high school	24	(34)
Some college, no degree	20	(28)
College degree and/or graduate school	11	(15)
<i>Relationship status, % (n)</i>		
Single	24	(34)
Married or living with partner	54	(76)
Divorced	17	(23)
Widowed	5	(7)
<i>Self-reported stage, % (n)</i>		
0 (DCIS)	9	(12)
1	20	(28)
2	27	(38)
3	16	(23)
Unknown to participant	28	(39)
<i>Surgery, % (n)</i>		
Lumpectomy	51	(71)
Mastectomy	49	(69)
<i>Hormonal therapy, % (n)</i>		
Yes	23	(32)
No	77	(108)
<i>Chemotherapy, % (n)</i>		
Yes	41	(58)
No	59	(82)
<i>Radiation, % (n)</i>		
Yes	64	(51)
No	36	(89)
<i>Previous diagnosis of cancer, % (n)</i>		
Yes	4	(6)
No	96	(134)
<i>Co-morbid medical condition, % (n)</i>		
Yes	46	(64)
No	54	(76)

Table 2. Descriptive statistics for predictors and dependent variables ($N = 140-122$).

Scale	Mean (SD)	Range
Subjective social status	5.26(1.89)	1-10
Acculturation	—	—
Latino identity	3.61(.56)	1-4
Spanish language use	3.63(.66)	1-4
American Identity	3.04(.99)	1-4
English language use	2.30(.97)	1-4
Treatment satisfaction	—	—
Satisfaction with self-evaluation	4.89(2.03)	1-7
Satisfaction with being cured of cancer	5.41(1.77)	1-7
Efficacy in patient-physician communication	22.0(3.16)	12-25
Cancer-specific distress Time 1	28.04(17.14)	0-70
Cancer-specific distress Time 2	25.45(18.69)	0-73
Depressive symptoms Time 1	15.72(13.19)	0-57
Depressive symptoms Time 2	15.22(13.60)	0-55
	%(<i>n</i>)	
Chronic stressors = 1	66(47)	—

both dependent variables. Approximately 63 and 59% of women scored above the clinical cut-off of 16 on depressive symptoms at Time 1 and Time 2. Approximately 51 and 57% of women scored above the clinical cut-off of 27 on cancer-specific distress at Time 1 and Time 2, respectively. There were no significant changes across time for either dependent variable ($p_s > .05$). Correlations among the study variables are available in Table 3.

Preliminary analyses

Examination of potential covariates to be included in Step 2 of the hierarchical regression models revealed three variables for inclusion. Receipt of radiation treatment was significantly related to depressive symptoms at Time 2 ($p < .05$). Longer time since surgery was significantly associated with less distress at Time 2 ($p < .05$). A previous diagnosis of cancer was associated with greater levels of depressive symptoms and cancer-specific distress at both time points ($p_s < .05$). No other covariates (e.g. income and surgery type) were significantly associated with study outcomes, and they were not included in the models.

Hierarchical regression analyses

Cross-sectional results

For the hierarchical regression model identifying factors related to depressive symptoms, socio-ecological variables (i.e. subjective social status, chronic stressors; Step 1) explained 11% of the variance in depressive symptoms ($p < 0.01$). Only chronic stressors was significantly related to depressive symptoms ($\beta = .30, p < .01$). However, subjective social status was marginally related to depressive symptoms ($\beta = -.15, p = .08$). Medical covariates (time since surgery, receipt of radiation treatment, previous diagnosis of cancer; Step 2) explained 7% of the variance ($p < 0.05$), and women with previous

Table 3. Correlations among study variables.

	Subjective social status	Latino identity	Spanish language use	American identity	English language use	Satisfaction with self evaluation	Satisfaction with being cured	Efficacy in communication	Distress Time 1	Distress Time 2	Depressive symptoms Time 1	Depressive symptoms Time 2
Subjective Social Status	1.0	-	-	-	-	-	-	-	-	-	-	-
Latino Identity	-.05	1.0	-	-	-	-	-	-	-	-	-	-
Spanish Language Use	-.03	.12	1.0	-	-	-	-	-	-	-	-	-
American Identity	.16	-.30**	-.20*	1.0	-	-	-	-	-	-	-	-
English Language Use	.30**	-.27**	-.34**	.41***	1.0	-	-	-	-	-	-	-
Satisfaction with Self Evaluation	.05	-.07	-.03	-.06	-.08	1.0	-	-	-	-	-	-
Satisfaction with Being Cured	.06	.12	-.01	.02	-.06	.24**	1.0	-	-	-	-	-
Efficacy in Communication	.15	.12	.05	.01	-.04	.19	.34**	1.0	-	-	-	-
Distress Time 1	-.13	.25**	-.07	-.09	-.11	-.36**	-.05	.01	1.0	-	-	-
Distress Time 2	.01	.23**	-.07	-.12	-.06	-.52***	-.22*	.01	.68***	1.0	-	-
Depressive Symptoms Time 1	-.21*	.20*	.01	-.16	-.07	-.45***	-.14	-.06	.58***	.64***	1.0	-
Depressive Symptoms Time 2	-.03	.16	-.03	-.12	.05	-.54***	-.28**	-.03	.46***	.71***	.65***	1.0

***p < .01, **p < .001.

diagnosis of cancer ($\beta = .23, p < .01$) had significantly greater depressive symptoms. Enculturation (Step 3), acculturation (Step 4) and self-efficacy in patient–physician communication (Step 5) did not explain a significant amount of variance in overall regression model (p_s for change $> .01$). The final model explained 18% of the variance in depressive symptoms at Time 1.

For the hierarchical regression model identifying factors related to cancer-specific distress, socio-ecological variables (Step 1) explained 16% of the variance in cancer-specific distress ($p < 0.01$). Only chronic stressors was significantly related to cancer-specific distress ($\beta = .41, p < .01$). Medical covariates (Step 2) were not statistically significant ($p > .05$). The addition of enculturation (Step 3) was statistically significant and explained an additional 4% of the variance in distress at Time 1 ($p < 0.05$) such that women with a stronger sense of Latino ethnic identity had greater distress at Time 1 ($\beta = .20, p < .05$). Acculturation (Step 4) and self-efficacy in patient–physician communication (Step 5) did not explain a significant amount of variance in the overall regression model (p_s for change $> .05$). The final model explained 20% of the variance in cancer-specific distress at Time 1.

Longitudinal results

For the hierarchical regression model identifying factors related to depressive symptoms across time, Time 1 depressive symptoms (Step 1) explained 41% of the variance of depressive symptoms at Time 2 ($p < .01$). Socio-ecological variables, (Step 2), did not explain a significant amount of the variance in the model. Cancer-related variables (Step 3) explained 4% of the variance of depressive symptoms at time 2 such that women who had a previous diagnosis of cancer had significantly greater depressive symptoms ($\beta = .20, p < .05$). Enculturation (Step 4), acculturation (Step 5), self-efficacy in patient–physician communication (Step 6) did not explain a significant amount of variance in the overall regression model (p_s for change $> .05$ for each step). Satisfaction with treatment (Step 7) explained an additional 10% of the variance. Within this step, greater satisfaction with self-evaluation ($\beta = -.28, p < .01$) and the perception of being cured after surgery ($\beta = -.18, p < .01$) were associated with fewer depressive symptoms at Time 2. The final model explained 54% of the variance in depressive symptoms at Time 2.

For the hierarchical regression model identifying factors related to cancer-specific distress, Time 1 distress (Step 1) explained 46% ($p < 0.01$) of the variance of cancer-specific distress at Time 2. Socio-ecological variables, (Step 2), cancer-related variables (Step 3), enculturation (Step 4), acculturation (Step 5) and self-efficacy in patient–physician communication (Step 6) did not explain significant variance (p_s for change $> .05$). Satisfaction with treatment (Step 7) explained an additional 11% of the variance ($p < 0.01$). Within this step, greater satisfaction with self-evaluation ($\beta = -.31, p < .01$) and perception of being cured after surgery ($\beta = -.17, p < .01$) were associated with less cancer-specific distress at Time 2. The final model explained 57% of the variance in cancer-specific distress at Time 2.

Post-hoc analysis

The finding that greater Latino ethnic identity, but not any of the acculturation variables, was related to cancer-specific distress at Time 1 led us to examine whether

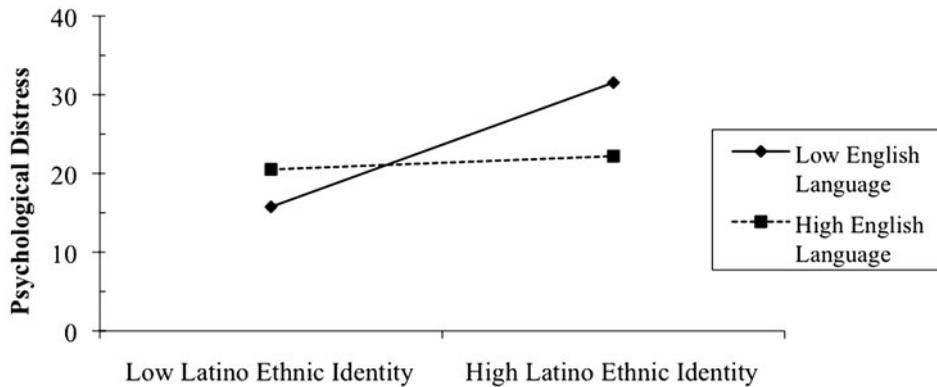


Figure 1. Interaction of Latino ethnic identity with English language use on cancer-specific distress at Time 1. Among women high on Latino ethnic identity, lower English language use was associated with more cancer-specific distress than higher English language use. However, among women low on Latino ethnic identity, there was no significant difference in distress between low and high English language use.

there was a significant interaction between Latino enculturation and acculturation on cancer-specific distress at Time 1. Specifically, we tested whether English language use moderated the relationship between Latino ethnic identity and cancer-specific distress at Time 1. Step 1 contained socio-ecological variables and Step 2 medical covariates. Step 3 contained the centred predictors of Latino ethnic identity and English language, and Step 4 the interaction term. The interaction between Latino ethnic identity and English language use explained 4% of the variance ($p < 0.01$) and the total model explained 18% of the variance. Post-hoc simple slope analyses were tested for low (-1 SD below the mean) and high ($+1$ SD above the mean) levels of English and revealed a significant effect for the slope of low English language use ($p < 0.01$). Low English language use was associated with greater cancer-specific distress for women higher in Latino ethnic identity versus those lower in Latino ethnic identity, whereas high English language use was not associated with cancer-specific distress ($p > 0.05$) (see Figure 1).

Discussion

Consistent with findings from another cross-sectional study of Latina survivors who were between 1–6 years post-diagnosis (Ashing-Giwa et al., 2013), we found that socio-ecological factors, specifically chronic stressors, contributed to the variance explaining depressive symptoms at Time 1. However, socio-ecological burden did not contribute to change in either outcome. After controlling for socio-ecological and cancer treatment-related covariates, greater Latino ethnic identity was associated with greater cancer-specific distress at Time 1. A post hoc interaction revealed that the combination of low English language use with high Latino ethnic identity was related to greater distress. Both depressive symptoms and cancer-specific distress had relatively high scores that, on average, were near to or above the clinical cut-offs for each respective measure. Our findings that Latina breast cancer survivors have elevated scores on distress and

depressive symptoms are consistent with the findings in the literature (Ashing-Giwa et al., 2013; Matthews & Gallo, 2011).

It is not surprising that women with greater chronic stressors evidenced greater cancer-specific distress and depressive symptoms. Prior to the receipt of a cancer diagnosis, racial/ethnic minority immigrants such as Latinas are likely to be experiencing ongoing stressors caused by ethnic discrimination, acculturative stress, financial concerns and language barriers to name a few causes (Arellano-Morales et al., 2015; McClure et al., 2015). Furthermore, undergoing a cancer diagnosis and treatment in the context of facing additional, ongoing stressors can exacerbate depressive symptoms and cancer-specific distress. To the best of our knowledge, this is the first study to report a deleterious relationship between Latino ethnic identity and cancer-specific distress in the breast cancer context. Our finding that enculturation was associated with cancer-specific distress, whereas acculturation did not demonstrate a significant relationship with psychological outcomes, underscores the importance of considering enculturation in future investigations.

Previous studies have reported mixed findings regarding the relationship between acculturation and psychological outcomes in the breast cancer context (Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009; Janz et al., 2009; Maly, Liu, Leake, Thind, & Diamant, 2010). One potential explanation is that although greater enculturation is associated with protective factors such as greater levels of familial support and reliance on faith (Gallo et al., 2009), it is possible that these protective factors do not buffer against the negative factors also known to be associated with enculturation, such as stigma about cancer, fatalistic beliefs about cancer, lack of knowledge or understanding about the disease and language barriers in communicating with health care providers (Gallo et al., 2009), which might contribute to the documented disparities in quality of life among Latina and NLWs who have been diagnosed with cancer. This study also suggests English language use as a moderating factor in the relationship between ethnic identity and cancer-specific distress among Latina breast cancer survivors. Greater English language use may reduce cancer-specific distress by facilitating both communication about cancer and decision-making about treatments, and ultimately providing a sense of control among Latinas facing a predominately English-speaking medical system.

The mean levels of self-reported treatment satisfaction in this study were lower than the means reported in a previous study of mostly NLW early stage breast cancer survivors (satisfaction with self-evaluation $M = 5.66$, satisfaction with being cured $M = 6.77$) who were assessed three months after their preoperative visit with their oncology surgeon (Stanton et al., 1998). As hypothesised, both satisfactions with surgical treatment variables were significantly related to improvement across both cancer-specific distress and depressive symptoms after controlling for socio-ecological factors, medical covariates and cultural factors. Satisfaction with perception of being cured had a weaker relationship to the study outcomes relative to satisfaction with self-evaluation (i.e. physical appearance, sense of femininity and sense of sexuality). This finding is not surprising given that women may not view surgery, but rather other treatments such as chemotherapy, as the sole or most important form of treatment in curing cancer and preventing recurrence. However, it is important to note that both treatment satisfaction variables and the study outcomes were assessed at the same time (Time 2), which might partially account for the magnitude of relationship. Our findings are consistent with

findings from qualitative and cross-sectional quantitative studies on Latina breast cancer survivors who report loss of self-esteem resulting from bodily changes caused by breast cancer treatment and the importance of treatment satisfaction in predicting quality of life outcomes (Ashing-Giwa et al., 2006; Fatone, Moadel, Foley, Fleming, & Jandorf, 2007; Graves et al., 2012; Lopez-Class et al., 2012).

Contrary to our hypothesis, perceived self-efficacy in patient–physician communication did not predict either outcome. Although some studies have established a direct relationship between self-efficacy in patient–provider communication and psychological outcomes (Maly et al., 2008), other studies suggest that self-efficacy in patient–physician communication is also indirectly related to psychological outcomes through factors such as treatment satisfaction and health behaviours such as exercising (Lim, Gonzalez, Wang-Letzkus, & Ashing-Giwa, 2009; Yanez et al., 2012). Self-efficacy in patient–physician communication was significantly correlated with satisfaction with being cured, which suggests that one potential indirect relationship between self-efficacy in patient–physician communication and psychological outcomes is through satisfaction with surgical treatment.

This study focused on a sample of Latina breast cancer patients that are underrepresented in the literature and employed a longitudinal design, both of which are strengths. Furthermore, this sample included a representation of Latinas from different countries. In order to maximise retention of an underserved, minority sample we employed a three-month follow-up assessment. Although a brief time frame, we believe that this time frame allowed us to sustain an acceptable retention rate (87%). However, future research should consider a longer time frame to establish predictors of change over the several years after diagnosis and treatment. Also, although the sample size in this study was too small to conduct analyses by Latino ancestry subgroups (e.g. Mexican versus South American), future studies should do so. Congruency in language spoken between the oncologist and patient was not assessed in the current study, therefore the extent to which language congruency facilitates efficacy in communication and treatment satisfaction is an important question for future research. Finally, it is also important to note that the majority of women were recruited from a hospital clinic with a patient navigation programme; therefore findings may not generalise to Latina women receiving treatment at hospitals without patient navigation resources. Although the navigation programme was not designed to influence surgical treatment satisfaction, it is possible that women's general experiences with the navigation programme indirectly improved their perceived satisfaction with treatment. However, despite access to patient navigation resources, the mean scores on cancer-specific distress and depressive symptoms were relatively high, suggesting that the impact of the patient navigation programme might not have extended to psychological outcomes.

In conclusion, the current findings add to the literature by elucidating the complex relationship between cultural factors and psychological outcomes among Latinas diagnosed with breast cancer. Additionally, the finding that both types of treatment satisfaction predicted improvement in psychological outcomes suggests that communication to enhance realistic expectations for the effects of surgical treatment and to bolster Latinas' sense of value as women might be important pre-surgical intervention targets for Latina women diagnosed with breast cancer.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the UCLA Jonsson Comprehensive Cancer Foundation (Yanez) and the Breast Cancer Research Foundation (Stanton).

References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology, 19*, 586–592. doi:10.1037/0278-6133.19.6.586
- American Cancer Society (2012). *Cancer Facts & Figures 2012*. Atlanta, GA: American Cancer Society.
- Arellano-Morales, L., Roesch, S. C., Gallo, L. C., Emory, K. T., Molina, K. M., Gonzalez, P., ... Penedo, F. J. (2015). Prevalence and correlates of perceived ethnic discrimination in the Hispanic community health study/study of Latinos sociocultural ancillary study. *Journal of Latina/o Psychology, 3*, 160–176. doi:10.1037/lat0000040
- Ashing-Giwa, K. T., Padilla, G. V., Bohorquez, D. E., Tejero, J. S., & Garcia, M. (2006). Understanding the breast cancer experience of Latina women. *Journal of Psychosocial Oncology, 24*, 19–52. doi:10.1300/J077v24n03_02
- Ashing-Giwa, K., Rosales, M., Lai, L., & Weitzel, J. (2013). Depressive symptomatology among Latina breast cancer survivors. *Psycho-Oncology, 22*, 845–853. doi:10.1002/pon.3084
- Baguena, M., Villaroya, E., Belena, A., Díaz, A., Roldan, C., & Reig, R. (2001). Psychometric properties of the Spanish version of the Impact of Event Scale-Revised (IES-R). *Analisis y Modificacion de Conducta, 27*, 581–604.
- Bellizzi, K. M. & Blank, T. O. (2006). Predicting posttraumatic growth in breast cancer survivors. *Health Psychology, 25*, 47–56. doi:10.1037/0278-6133.25.1.47
- Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology, 46*, 5–34. doi:10.1111/j.1464-0597.1997.tb01087.x
- Chen, J. Y., Diamant, A. L., Thind, A., & Maly, R. C. (2008). Determinants of breast cancer knowledge among newly diagnosed, low-income, medically underserved women with breast cancer. *Cancer, 112*, 1153–1161.
- Fann, J. R., Thomas-Rich, A. M., Katon, W. J., Cowley, D., Pepping, M., McGregor, B. A., & Gralow, J. (2008). Major depression after breast cancer: a review of epidemiology and treatment. *General Hospital Psychiatry, 30*, 112–126. doi: 10.1016/j.genhosppsych.2007.10.008
- Fatone, A. M., Moadel, A. B., Foley, F. W., Fleming, M., & Jandorf, L. (2007). Urban voices: The quality-of-life experience among women of color with breast cancer. *Palliative & Supportive Care, 5*, 115–125. doi:10.1017/S1478951507070186
- Gallo, L. C., & Matthews, K. A. (2003). Understanding the association between socioeconomic status and physical health: Do negative emotions play a role?. *Psychological Bulletin, 129*, 10–51. doi:10.1037/0033-2909.129.1.10
- Gallo, L. C., Penedo, F. J., Espinosa de los Monteros, K., & Arguelles, W. (2009). Resiliency in the face of disadvantage: Do Hispanic cultural characteristics protect health outcomes?. *Journal of Personality, 77*, 1707–1746. doi:10.1111/j.1467-6494.2009.00598.x
- Golding, J. M., & Aneshensel, C. S. (1989). Factor structure of the center for epidemiologic studies depression scale among Mexican Americans and non-Hispanic Whites. *Psychological*

- Assessment: A Journal of Consulting and Clinical Psychology*, 1, 163–168. doi:10.1037/1040-3590.1.3.163
- Gonzales, N. A., Knight, G. P., Morgan-Lopez, A. A., Saenz, D., & Sirolli, A. (2002). Acculturation and the mental health of Latino youths: An integration and critique of the literature. In J. M. Contreras, M. Josefina, K. A. Kerns, and A. M. Neal-Barnett (Eds.), *In Latino children and families in the United States: Current research and future directions* (pp. 45–74). Westport, CT: Praeger Publishers/Greenwood Publishing Group.
- Graves, K. D., Jensen, R. E., Cañar, J., Perret-Gentil, M., Leventhal, K.-G., Gonzalez, F., ... Cacedo, L. (2012). Through the lens of culture: quality of life among Latina breast cancer survivors. *Breast Cancer Research and Treatment*, 136, 603–613. doi:10.1007/s10549-012-2291-2
- Hawley, S. T., Fagerlin, A., Janz, N. K., & Katz, S. J. (2008). Racial/ethnic disparities in knowledge about risks and benefits of breast cancer treatment: Does it matter where you go?. *Health Services Research*, 43, 1366–1387. doi:10.1111/j.1475-6773.2008.00843.x
- Janz, N. K., Mujahid, M. S., Hawley, S. T., Griggs, J. J., Hamilton, A. S., & Katz, S. J. (2008). Racial/ethnic differences in adequacy of information and support for women with breast cancer. *Cancer*, 113, 1058–1067. doi:10.1002/cncr.23660
- Janz, N., Mujahid, M., Hawley, S., Griggs, J., Alderman, A., Hamilton, A., ... Graff, J. (2009). Racial/ethnic differences in quality of life after diagnosis of breast cancer. *Journal of Cancer Survivorship*, 3, 212–222. doi:10.1007/s11764-009-0097-y
- Lim, J.-W., Gonzalez, P., Wang-Letzkus, M., & Ashing-Giwa, K. (2009). Understanding the cultural health belief model influencing health behaviors and health-related quality of life between Latina and Asian-American breast cancer survivors. *Supportive Care in Cancer*, 17, 1137–1147. doi:10.1007/s00520-008-0547-5
- Lopez-Class, M., Gomez-Duarte, J., Graves, K., & Ashing-Giwa, K. (2012). A contextual approach to understanding breast cancer survivorship among Latinas. *Psycho-Oncology*, 21, 115–124. doi:10.1002/pon.1998
- Maly, R. C., Frank, J. C., Marshall, G. N., DiMatteo, M. R., & Reuben, D. B. (1998). Perceived efficacy in patient-physician interactions (PEPPI): Validation of an instrument in older persons. *Journal of the American Geriatrics Society*, 46, 889–894.
- Maly, R. C., Leake, B., & Silliman, R. A. (2003). Health care disparities in older patients with breast carcinoma. *Cancer*, 97, 1517–1527. doi:10.1002/cncr.11211
- Maly, R. C., Umezawa, Y., Ratliff, C. T., & Leake, B. (2006). Racial/ethnic group differences in treatment decision-making and treatment received among older breast carcinoma patients. *Cancer*, 106, 957–965. doi:10.1002/cncr.21680
- Maly, R. C., Stein, J. A., Umezawa, Y., Leake, B., & Anglin, M. D. (2008). Racial/ethnic differences in breast cancer outcomes among older patients: Effects of physician communication and patient empowerment. *Health Psychology*, 27, 728–736. doi:10.1037/0278-6133.27.6.728
- Maly, R., Liu, Y., Leake, B., Thind, A., & Diamant, A. (2010). Treatment-related symptoms among underserved women with breast cancer: the impact of physician-patient communication. *Breast Cancer Research and Treatment*, 119, 707–716. doi:10.1007/s10549-009-0418-x
- Matthews, K. A., & Gallo, L. C. (2011). Psychological perspectives on pathways linking socioeconomic status and physical health. *Annual Review of Psychology*, 62, 501–530. doi:10.1146/annurev.psych.031809.130711
- McClure, H. H., Josh Snodgrass, J., Martinez, C. R., Squires, E. C., Jiménez, R. A., Isordia, L. E., ... Eddy, J. (2015). Stress, place, and allostatic load among Mexican immigrant farmworkers in Oregon. *Journal of Immigrant and Minority Health*, 17, 1518–1525. doi:10.1007/s10903-014-0066-z
- Moadel, A. B., Morgan, C., & Dutcher, J. (2007). Psychosocial needs assessment among an underserved, ethnically diverse cancer patient population. *Cancer*, 109, 446–454. doi:10.1002/cncr.22357

- Myers, H. F. (2009). Ethnicity- and socio-economic status-related stresses in context: An integrative review and conceptual model. *Journal of Behavioral Medicine, 32*, 9–19. doi:10.1007/s10865-008-9181-4
- Pinquart, M. & Duberstein, P. R. (2010). Depression and cancer mortality: a meta-analysis. *Psychological Medicine, 40*, 1797–1810. doi:10.1017/S0033291709992285
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.
- Satin, J. R., Linden, W., & Phillips, M. J. (2009). Depression as a predictor of disease progression and mortality in cancer patients. *Cancer, 115*, 5349–5361. doi:10.1002/cncr.24561
- Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: Implications for theory and research. *American Psychologist, 65*, 237–251. doi:10.1037/a0019330
- Stanton, A. L., Estes, M. A., Estes, N. C., Cameron, C. L., Danoff-Burg, S., & Irving, L. M. (1998). Treatment decision making and adjustment to breast cancer: A longitudinal study. *Journal of Consulting and Clinical Psychology, 66*, 313–322. doi:10.1037/0022-006X.66.2.313
- Stanton, A. L., Revenson, T. A., & Tennen, H. (2007). Health psychology: Psychological adjustment to chronic disease. *Annual Review of Psychology, 58*, 565–592. doi:10.1146/annurev.psych.58.110405.085615
- Troxel, W. M., Matthews, K. A., Bromberger, J. T., & Sutton-Tyrrell, K. (2003). Chronic stress burden, discrimination, and subclinical carotid artery disease in African American and Caucasian women. *Health Psychology, 22*, 300–309. doi:10.1037/0278-6133.22.3.300
- Weiss, D. S. & Marmar, C. R. (1997). The impact of event scale – Revised. In J. P. W. T. M. Keane (Ed.), *Assessing psychological trauma and PTSD* (pp. 399–411). New York, NY: Guilford Press.
- Wittenberg, L., Yutsis, M., Taylor, S., Giese-Davis, J., Bliss-Isberg, C., Star, P., & Spiegel, D. (2010). Marital status predicts change in distress and well-being in women newly diagnosed with breast cancer and their peer counselors. *The Breast Journal, 16*, 481–489. doi:10.1111/j.1524-4741.2010.00964.x
- Wolff, L. S., Subramanian, S. V., Acevedo-Garcia, D., Weber, D., & Kawachi, I. (2010). Compared to whom? Subjective social status, self-rated health, and referent group sensitivity in a diverse US sample. *Social Science & Medicine, 70*, 2019–2028. doi:10.1016/j.socscimed.2010.02.033
- Yanez, B., Thompson, E. H., & Stanton, A. L. (2011). Quality of life among Latina breast cancer patients: a systematic review of the literature. *Journal of Cancer Survivorship, 5*, 191–207. doi:10.1007/s11764-011-0171-0
- Yanez, B., Stanton, A. L., & Maly, R. C. (2012). Breast cancer treatment decision making among Latinas and non-Latina Whites: A communication model predicting decisional outcomes and quality of life. *Health Psychology, 31*, (552–561. doi:10.1037/a0028629
- Zea, M. C., Asner-Self, K. K., Birman, D., & Buki, L. P. (2003). The abbreviated multidimensional acculturation scale: empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology, 9*, 107–126. doi:10.1037/1099-9809.9.2.107