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Brief Reports

Depressive Symptoms and Quality of Life Among Adolescent and Young Adult Cancer Survivors: Impact of Gender and Latino Culture

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Ethnic and sex variations in depressive symptoms and quality of life (QOL) among adolescent and young adult (AYA) childhood cancer survivors were explored among a sample of Latino and non-Latino childhood cancer survivors (CCSs) ($n = 194$) treated at hospitals in Los Angeles County. Latinos scored higher in depressive symptoms and lower in QOL when compared with non-Latinos. Males had higher depressive symptoms. Among Latinos, higher levels of acculturation were associated with depression and a poorer QOL, and we found that more acculturated Latino males were more likely to have meaningful levels of depression than less acculturated males or females. Interventions addressing depressive symptoms may be most needed for Hispanic male CCSs.

Keywords: adolescent, young adult, quality of life, cancer, depression, acculturation, Latino

Introduction

Childhood cancer survivors (CCSs) are at unique risk for a host of health complications across their life span, in part, due to late effects of their treatment protocols and stresses associated with the cancer experience. A recently published study of 1667 CCSs found that close to 12% experience meaningful depression and overall poorer quality of life (QOL), more than their non-CCS siblings.[1] Depression is of particular concern given the high incidence among CCSs especially among younger survivors[2,3]; its relation to physical health issues such as cardiovascular disease[4]; and its well-established relationship to compliance and follow-up care.[5,6] This investigation explores gender and ethnic variations in depressive symptoms and QOL among Latino CCSs.

Cultural variation and mental health

Latinos are known to have higher rates of depression than other cultural groups. In existing literature, Latinos report more depressive symptoms than other ethnic groups.[7] Among cancer patient populations, observed mental health disparities suggest that Latino survivors are at greater risk for depression than non-Latino cancer survivors[8]; the disparity is less clear among adolescents and emerging adults.

Quality of life

Health-related QOL reflects an individual's health status as well as social and emotional well-being and is highly associated with depression.[9] Like depression, women are more likely to report lower QOL than men[9]; and Latino men, in a study of prostate cancer survivors, reported lower levels of QOL than their Caucasian counterparts.

Acculturation and mental health

Acculturation is defined as cultural modification of an individual, group, or people by adapting to or borrowing traits from another culture.[11] For this study, U.S. culture is the other culture being adapted to and previous work has found that adapting to U.S. culture has a negative impact on mental health. The relationship between depression and acculturation suggests that acculturation is a risk factor for depression, with higher U.S. acculturation associated with greater depression.[12–14] The reasons for this impact are unclear, some suggest that this may be due to increased familial conflict as children move away from a family's traditions and way of being.[12] Others suggest that a loss of a traditional ethnic identity can lead to an overall loss of identity.[15] Less is known about the relationships between QOL and acculturation, but studies have found a similar pattern in terms of

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disparities among Latinos; Latina breast cancer survivors report lower functioning across all domains of quality of life, including emotional, physical, and social well-being.[16]

Sex differences

Among the general population, females are more likely to report higher levels of depression than males.[17] This sex difference is similar among adult cancer patients[18] where adult female survivors also report higher levels of emotional distress[19] and lower levels of QOL.[20] We know less about depression levels among AYA CCSs, and the interaction of sex differences with acculturation (among Latinos) is under investigation. Acculturation's impact on health and well-being varies by sex, with males possibly having more difficulty in social realms when less acculturated.[21] However, because other work has found that less acculturated women are more likely to engage in unhealthy behaviors,[22] this relationship needs further exploration.

Current study

We explored potential mental health disparities between Latinos and other groups and, among Latinos, associations with acculturation among adolescent and young adult (AYA) survivors. We explored the following hypotheses: (1) Latino CCSs will have higher scores of depressive symptoms than other ethnic groups; (2) Latino CCSs will have lower levels of QOL than other ethnic groups; (3) among Latinos, higher levels of acculturation will be associated with higher levels of depressive symptoms; and (4) gender differences in levels of depression will be found with females reporting higher levels of depression and lower levels of QOL.

Methods

Sample

Data from the Project Forward study were used for the present analysis, comprising a cohort of CCSs diagnosed with having any type of cancer (except Hodgkin's disease) from two large pediatric medical centers in Los Angeles County ($n = 194$). Data were collected from 2011 to early 2012, with analyses continuing through 2016. Participants' cancers were diagnosed between the ages of 5 and 18 years and were between 15 and 25 years old at the time of data collection; all participants were 2 or more years from treatment for their cancer. Study procedures have been previously described[23]; briefly, CCSs were identified through the Los Angeles Cancer Surveillance Program, the Surveillance, Epidemiology, and End Results (SEER) Cancer Registry covering Los Angeles County, and mailed a survey to complete. The recruitment rate for the study was 50%, comparable with or exceeding similar studies.[24] The study was approved by the California Committee for the Protection of Human Subjects, the California Cancer Registry, and the Institutional Review Boards at the University of Southern California, as well as the Institutional Review Boards at both pediatric hospitals, Children's Hospital Los Angeles and Miller's Children's Hospital.

Measures

All measures have been used among AYAs in other studies and have been reported by our group in several published studies.[25–30]

Demographics. Demographics were measured through self-reported gender and ethnicity; the socioeconomic status (SES) was taken from census tract information gathered from reported address on the cancer registry site.[27]

Treatment intensity. Treatment intensity was calculated using the Intensity of Treatment Rating Scale 2.0 (ITR-2).[31] This scale uses cancer registry data and medical chart reviews to categorize treatments into four levels of intensity: 1 = least intensive (e.g., surgery only), 2 = moderately intensive (e.g., chemotherapy or radiation), 3 = very intensive (e.g., two or more treatment modalities), and 4 = most intensive (e.g., relapse protocols).

Acculturation. Acculturation was assessed with the 13-item Acculturation Rating Scale for Mexican Americans-II (ARSMA-II).[32] The ARSMA-II is one of the earliest and most widely used measure of acculturation. The ARSMA-II provides two scores indicating the degree of orientation to the U.S./Anglo culture (Anglo Orientation Scale Score) and Mexican/Latino culture (Mexican Orientation Scale Score). The ARSMA-II assesses the following cultural behaviors: language use and preference, ethnic identity and classification, cultural heritage and ethnic behavior, and ethnic interaction. Cronbach's alphas are 0.83 for Anglo orientation and 0.88 for Mexican orientation.[32] We addressed acculturation by looking specifically at those who scored high on levels of Hispanic/Latino orientation on the Cuellar measure of acculturation, which can separate respondents into those who endorse items that are associated with Latino culture[32] from those who do not. Similar to approaches reported in other studies, higher levels were assigned based on a median split of either the Hispanic-oriented items or the Anglo ones.[33]

Depressive symptoms. Depressive symptoms were assessed with the 20-item Center for Epidemiologic Studies Depression Scale (CES-D), a 20-item measure that has been validated in diverse populations and age groups.[34]

Meaningful level of depressive symptoms. Meaningful level of depressive symptoms was categorized by dichotomizing the sample using a cut point of 16 on the CES-D, the suggested cut point established for use with the CES-D to help distinguish between mild and possibly more severe levels of symptoms with greater clinical significance.[35]

Quality of life. QOL was measured by using the widely used PedsQL scale, which contains 23 items and subscales that addressed physical, emotional, and social functioning and has been used with older adolescents and young adults in previous studies despite being developed for children aged 13–18 years.[36] Sample items include ''It is hard for me to run'' and ''I cannot do things that others my age can do.''

Statistical analyses

Descriptive statistics, including frequencies, *t*-tests, and Pearson's correlations, were conducted between candidate variables and the outcome variable, depressive symptoms. Univariate and multivariable linear regression analyses were performed to assess factors associated with the outcome variable. Inclusion in the final models was based on both significant

Table 1. Demographics and Ethnic Differences

	Total sample (n = *194*)	*Latino* (n = *91*)	*Non-Latino* (n = *103*)
Mean age at time of completing the survey, years	20.75	20.42	21.17
% female	49.36	52.37	45.63
Treatment intensity (range from 1 to 4 with higher scores indicating higher treatment intensity)	2.66	2.54	2.67
Depressive symptoms (mean CES-D)	14.25	15.91**	12.13
Meaningful depressive symptoms (% over cut point of 16 on CES-D)	32.34	37.88*	25.24
QOL (lower number indicates lower QOL)	77.25	75.14**	77.29
SES	2.88	1.95***	3.85

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
CES-D, Center for Epidemiologic Studies Depression Scale; QOL, quality of life; SES, socioeconomic status.

correlations and theoretical considerations. Treatment intensity was controlled for because of its clinical significance.[31] The final regression models included acculturation, age, treatment intensity, ethnicity, SES, and sex. We used a chi-square test to test for differences between cases of meaningful depression by high and low levels of acculturation and gender. All data analyses were conducted using SAS statistical software.

Results

Sample characteristics

A total of 194 cancer survivors completed a survey, with 103 endorsing that they were Latino and 91 reporting as non-Latino. Latinos are mostly first-generation Latino (86% of Latino). Our non-Latino group is very diverse and includes African Americans, whites, and individuals of Asian descent. Forty-eight percent of our sample is female. The mean age of respondents was 20.7 (standard deviation = 2.77) years. Table 1 summarizes the demographic variables for the whole sample as well as ethnic differences.

We used *t*-tests to test hypotheses 1 and 2: (1) Latino CCSs will have higher scores of depressive symptoms than other ethnic groups and (2) Latino CCSs will have lower levels of QOL. We found support for both these hypotheses. Latinos had higher depressive symptoms relative to other ethnic groups surveyed and had lower reports of overall QOL. The mean values for depressive symptoms and QOL are presented in Table 1.

Depressive symptoms and QOL

We found that when we tested for correlations among our variables, there was an inverse relationship between depression and QOL, where depression was negatively correlated with QOL. We tested the association for Latinos only between Latino orientation and depression and Latino orientation and QOL. We found significant correlations. Acculturation in terms of having a high Latino orientation was negatively correlated with depressive symptoms and was moderately positively correlated with a better QOL (Table 2).

We further explored whether depressive symptoms were associated with QOL for this sample of CCSs. We used multivariate regression models to explore whether depression was associated with QOL. Depressive symptoms were inversely associated with QOL in regression models that included both Latino/a and non-Latinos ($f = 317.47$, $p < 0.001$) after controlling for sex, age, intensity of treatment, and SES (Table 3).

Acculturation

To test hypothesis three that among Latinos, higher levels of acculturation will be associated with higher levels of depressive symptoms, we used multivariate regression models. Latinos who scored higher on the measure of Latino acculturation had higher scores on the CES-D ($f = 2.47$ (0.98), $p < 0.05$) and were more likely to exceed the cutoff for meaningful depression in regression models controlling for age, gender, SES, and treatment intensity, $f = 0.61$ (0.20) $p < 0.05$. A similar relationship was observed for functioning, those who endorsed lower levels of Latino orientation reported lower levels of QOL after controlling for sex, age, intensity of treatment, and SES ($f = 5.74$ (1.44), $p < 0.001$).

Sex differences

To test hypothesis four that gender differences in levels of depression will be found with females reporting higher levels of depression and lower levels of QOL, we employed a series of *t*-tests to explore mean sex differences in depressive symptoms and QOL. We did not find support for our initial hypothesis and instead found that males reported higher

Table 2. Correlations Among Variables

	SES	*Gender*	*Treatment intensity*	*Age*	*Depression*	*PEDS-QL*
SES	—	0.10	–0.06	0.12*	–0.16*	0.04
Treatment intensity			—	–0.21	–0.05	–0.05
Age				—	–0.02	0.06
Depression					—	–0.75***
Latino orientation (Latinos only)					–0.17*	0.30**

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
PEDS-QL, Pediatric Quality of Life Health Outcomes Measure.

Table 3. Multivariate Regression Results

	Depressive symptoms		*QOL*	
	Estimate (SE)	p	*Estimate (SE)*	p
Latino orientation	−2.47 (0.98)**	0.01	5.74 (1.45)***	0.001
Gender	1.45 (2.22)	0.51	−5.26 (3.25)	0.10
Age	0.27 (0.42)	0.53	0.28 (0.62)	0.65
Treatment intensity	1.45 (1.32)	0.27	−2.24 (1.95)	0.25
SES	−2.58 (1.07)*	0.02	2.56 (1.57)	0.11

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
SE, standard error.

depressive symptoms and lower QOL. Overall, males scored higher (14.43 vs. 14.06, $p < 0.05$) than females on depressive symptoms. To explore whether those who score as having meaningful depressive symptoms differed by gender and acculturation, we used a chi-square test. We categorized cases as they differed by gender and a high versus a low level of a median split acculturation. Despite small numbers of cases, significant differences were found, $\delta = 4.84$, $p < 0.05$ (Fig. 1).

Discussion

Latinos scored higher in depressive symptoms and lower in QOL than non-Latinos. Consistent with prior research, acculturation among Latinos was a risk factor for depressive symptoms. Scoring higher on measures of Latino orientation was associated with lower levels of depressive symptoms. This relationship remained after controlling for sex, age, treatment intensity, and SES. Acculturation was also associated with lower levels of functioning; as respondents reported less connection with Latino identity, they reported less mental health and QOL.

Contrary to hypotheses, males (vs. females) had higher levels of depression and lower QOL. Especially at risk were males lower in Latino orientation. These data suggest that Latinos with a stronger connection with Latino heritage may be higher functioning than those who do not have that connection. The causes of these depressive symptoms are unknown; they may be overlooked for additional care because of underestimates of need. A loss of ethnic identity may put AYAs at additional risk for depression or young Latino men may be reporting distress at their inability to care for their families due to late effects, as this may be central to their self-concept.

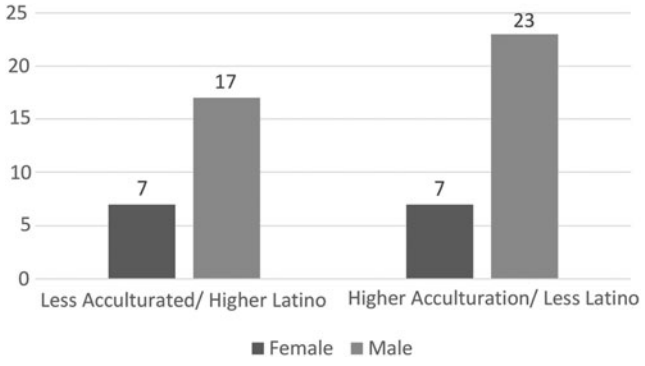

FIG. 1. Cases of survivors considered at risk for meaningful depression.

Implications

AYA Latino male CCSs reported the highest depressive symptoms. Based on existing literature, clinicians may not be aware of the possible psychosocial problems of young Latino males who speak English. AYA male survivors may be less likely to be connected with additional services or care because they are overlooked as a group at risk for serious mental health issues. Clinicians should be conscious of the needs of this population with particular focus on more acculturated Hispanic/Latino male CCSs.

Future research is needed to disentangle these ethnic variations and sex findings. The group among Latinos that appears to be at lowest risk for true depression comprises females who indicate a strong connection to Latino culture. Factors that may contribute to the protection could include cultural values such as familism, a value placed on family above all else.[35] Social support may also play a mediating or moderating role among this group as well.

Limitations

Limitations of these findings include the uniqueness of this sample, which is predominately of Mexican American descent treated at two large hospitals in Los Angeles County. Future work examining larger diverse samples is needed as these are small numbers of cases. These data are cross-sectional and we are limited by the study design in understanding all the factors that may have contributed to these higher levels of depressive symptoms reported. While all measures have been used previously in published studies, their psychometric properties specifically among AYAs should be studied. Additionally, the ARSMA-II scale, a widely used and validated measure of acculturation among Latinos, is limited in the way it approaches culture with questions that reflect behavior more than ideology. Acculturation is a complex process and this study is limited in its ability to understand the impact that this complexity has on Latino AYAs. While statistically significant differences were obtained between the Latino and the non-Latino groups and between males and females, the average scores for both groups were well below the clinical cutoff, and the actual size of the difference between the means was small, suggesting that the true clinical implications of these findings warrant further investigation before clinical recommendations are given.

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Author Disclosure Statement

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