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Spiritual Well-Being in Hispanic and Non-Hispanic Survivors of Allogeneic Hematopoietic Stem Cell Transplantation

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Abstract

Research suggests that spiritual well-being positively contributes to quality of life during and following cancer treatment. This relationship has not been well-described in ethnically diverse survivors of allogeneic transplantation. This study compares spiritual well-being and quality of life of Hispanic (n=69) and non-Hispanic (n=102) survivors. Hispanic participants were significantly younger, and reported significantly greater spiritual well-being than non-Hispanic survivors. Survivors with higher spiritual well-being had significantly better quality of life. Meaning and Peace significantly predicted quality of life. Although Hispanic survivors report greater spiritual well-being, Meaning and Peace, irrespective of ethnicity, have a salutary effect on quality of life.

Keywords

Spiritual well-being; stem cell transplant; Hispanic; health related quality of life; coping; survivorship

Introduction

Allogeneic hematopoietic stem cell transplantation (HSCT) offers patients with various malignant and non-malignant hematologic disorders a chance for cure (Babushok & Hexner, 2014; Fadilah & Aqilah, 2012; Gribben, Hosing, & Maloney, 2011; Liu, Stock, & Bishop,

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Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

2013; Oran & Weisdorf, 2011; Parmar & Ritchie, 2014; Peinemann, Bartel, & Grouven, 2013; Spitzer, Dey, Chen, Attar, & Ballen, 2012; Tsirigotis, Shimoni, & Nagler, 2014). Previously associated with significant risks for morbidity and mortality, allogeneic HSCT now offers significant improvements in transplant survival due to progress in the application of new and advanced therapies as well as refinement of transplant-related procedures and supportive care (Gooley et al., 2010; Kurosawa et al., 2013; Mohty & Mohty, 2011; Spitzer et al., 2012; Syrjala, Martin, & Lee, 2012). However, despite these improvements, allogeneic HSCT is not without major complications (Arnaout et al., 2014; Majhail & Rizzo, 2013; Mohty & Mohty, 2011).

While acute complications may resolve in the early post-transplant period, persistent and late effects may affect survivors for years following allogeneic HSCT (Syrjala et al., 2012). Transplant complications arise as a result of the conditioning regimen, the new donor-derived immune system, sequelae from prolonged immunosuppressant treatments that prevent acute and chronic graft-versus-host disease and side effects from supportive medications (Arnaout et al., 2014; Bevens et al., 2014; Mitchell et al., 2010; Pidala, Anasetti, & Jim, 2009; Tichelli, Roivo, & Socie, 2012). In addition to these biological effects, unpleasant symptoms, functional impairment, and psychosocial distress (for example fear of recurrence) can have a deleterious impact on several patient-centered outcomes, including health-related quality of life (HRQL) (Bevens et al., 2014; Gifford, Sim, Horne, & Ma, 2014; Kenzik, Huang, Rizzo, Shenkman, & Wingard, 2014; Mitchell et al., 2010; Mohty & Mohty, 2011; Norkin, Hsu, & Wingard, 2012; Pidala et al., 2009; Sarkar et al., 2014; Syrjala et al., 2012; Tichelli et al., 2012).

The construct of spiritual well-being is theorized to be multidimensional, including an awareness that one's life has meaning and purpose, an inner sense of peace and harmony, and a set of beliefs, including faith in a higher power, that provides strength and comfort, particularly during adversity (Bai & Lazenby, 2014; Whitford & Olver, 2012). Spiritual well-being is thought to be comprised of three dimensions, specifically Meaning, Peace and Faith (Canada, Murphy, Fitchett, Peterman, & Schover, 2008). While many factors influence an individual's physical, emotional and mental health, spiritual well-being has been identified as an important resource in managing the challenges of intensive cancer treatment, including HSCT. (Canada et al., 2013; Farsi, Dehghan Nayeri, & Negarandeh, 2010; Gonzalez et al., 2014; Harris et al., 2010; King, Fitchett, & Berry, 2013; Ragsdale, Hegner, Mueller, & Davies, 2014; Yanez et al., 2009). While spiritual well-being may incorporate an existential relationship with a higher power that strengthens one's beliefs, values and life purpose, (Anandarajah & Hight, 2001; Hoffert, Henshaw, & Mvududu, 2007), spiritual well-being is distinct from religiosity, defined as a formalized belief system experienced through ritual behaviors and shared religious beliefs usually practiced in community with other individuals (Hodge, 2005; Musgrave, Allen, & Allen, 2002; Taylor, 2001). Spiritual well-being is also distinct from constructs such as religious or spiritual coping, existential well-being, hope or sense of coherence, though these may contribute to spiritual well-being.

Studies suggest that spiritual well-being is positively related to HRQL outcomes in patients with cancer during and following treatment, including those undergoing HSCT (Andrykowski et al., 2005; Canada et al., 2008; Edmondson, Park, Blank, Fenster, & Mills,

2008; Musgrave et al., 2002; Taylor, 2001; Weisman, Rosales, Kymalainen, & Armesto, 2005), and negatively associated with depression in cancer survivors (Gonzalez et al., 2014). In their recent systematic review of the association between spiritual well-being and HRQL at both the scale and the factor level, Bai and Lazenby concluded that there was a strong and consistent relationship between HRQL and two components of spiritual well-being, specifically Meaning and Peace (Bai & Lazenby, 2014). However, an independent association between the faith component and HRQL was only found in 2 of 36 studies reviews (Bai & Lazenby, 2014). Bai and Lazenby also observed that across samples, the magnitude of association between Meaning and Peace and mental health and emotional well-being was as high as 0.73, suggesting that while there may be some construct similarity, the associations are not fully accounted for by conceptual overlap (Bai & Lazenby, 2014). A recently published study suggests that Peace and Meaning each contribute unique variance to HRQL and that the importance of these dimensions of spiritual well-being may shift over time (Bai & Lazenby, 2014). Corollary evidence from studies in allogeneic HSCT recipients indicate that global meaning, a general sense that one's life has purpose and coherence, and thus a construct that is related to aspects of spiritual well-being (Sherman, Simonton, Latif, Spohn, & Tricot, 2005), is positively associated with psychological adjustment (Johnson Vickberg et al., 2001), and negatively associated with functional status (Edman, Larsen, Hagglund, & Gardulf, 2001). In allogeneic HSCT, lowered levels of spiritual well-being are also associated with increased transplant mortality (Pereira et al., 2010).

Taken together, this body of literature supports a conclusion that spiritual well-being, especially a sense of Peace and Meaning, can be an important resource in coping with the challenges of intensive cancer treatment and may serve to bolster HRQL. However the degree to which spiritual well-being is preserved in long-term survivors of allogeneic stem cell transplantation, and the relationship between spiritual well-being and HRQL, have not been well-described, particularly in ethnically diverse samples of transplant survivors. A number of the beliefs and practices that reflect spiritual well-being have an association with ethnicity (Buck & McMillan, 2008; Franzini, Ribble, & Wingfield, 2005; Taylor, 2001), and some investigators have noted racial/ethnic differences in spiritual well-being (Ashing-Giwa et al., 2004; Canada et al., 2013; Levine, Yoo, Aviv, Ewing, & Au, 2007). For example, Hispanic cancer patients, specifically, have reported a higher level of religiosity and are more likely to employ prayer and other religious or spiritual practices when coping with a medical hardship, compared to White or Asian Americans with cancer (Aranda, 2008; McBrien, 2006; Moadel et al., 1999; Taylor, 2001; Weisman et al., 2005). Thus, based on the positive association between spiritual well-being and favorable health outcomes, including HRQL, in patients during and following cancer treatment, we were interested to explore these relationships in an ethnically diverse sample of long-term survivors of HSCT, and to examine the effects of ethnicity on spiritual well-being. Accordingly, the aims of this analysis were to 1) describe the spiritual well-being of allogeneic HSCT survivors; 2) explore whether spiritual well-being differs between Hispanic and non-Hispanic allogeneic transplant survivors; and to 3) determine which components of spiritual well-being (meaning, peace, faith) predict HRQL in allogeneic HSCT survivors.

Materials and Methods

Study Design and Participants

This study used cross-sectional data collected from an IRB-approved, prospective longitudinal study examining the functional status, symptom experience, psychosocial adjustment and HRQL of patients 3 years following allogeneic HSCT (Bevans et al., 2011). One hundred and seventy three adult patients were enrolled from June 2005 to December 2010 if they had received their first allogeneic HSCT for a hematological disease (malignant or non-malignant) or solid tumor at the NIH Clinical Center. Participants, were also literate in English or Spanish, and had a life expectancy of at least six months. All study participants provided written informed consent.

Of the 173 patients enrolled in the study, one withdrew prior to completing study procedures due to vision impairment (n=1), and one died prior to completing the survey (n=1). Therefore, complete data at the time of study enrollment were available on 171 patients for this analysis. Additional sample details and the primary study findings have been previously published (Bevans et al., 2014).

Measurement and Outcomes

Spiritual well-being was measured using the FACIT-Spiritual subscale (SpWB), and HRQL was measured using the Functional Assessment of Cancer Therapy-General (FACT-G) questionnaire. Demographic and clinical data were collected by patient self-report and review of medical records. Demographic data included: age, gender, ethnicity, race, marital status, education level, employment status, region of birth, country of residence, level of acculturation, and the length of time in the U.S. Clinical data included: primary disease, current evidence of disease (treatment for disease relapse within the past year), Eastern Cooperative Oncology Group (ECOG) performance status ("Eastern Cooperative Oncology Group," 2002), conditioning regimen, stem cell source, degree of HLA compatibility, and the time in months since allogeneic HSCT.

FACT-G—The FACT-G is a 27-item cancer-specific HRQL measure reflecting four domains of well-being: physical, social/family, emotional, and functional (Cella, 2004). Responses are rated from 0 (not at all) to 4 (very much) based on a 7-day recall. Scores can range from 0–108, with higher scores indicating better HRQL. A 5-point difference in the FACT-G total score has been specified as indicating a clinically relevant change in quality of life (Brucker, Yost, Cashy, Webster, & Cella, 2005). Evidence of construct validity, internal consistency reliability ($\alpha=0.89$) and test-retest reliability ($\alpha=0.92$) have been previously documented in various cancer populations (Cella, 2004; Dobrez, Cella, Pickard, Lai, & Nickolov, 2007). In this study, the internal consistency reliability coefficient alpha was 0.70 for the total score and each subscale. The FACT-G has been previously translated into Spanish by the FACIT multilingual translation project using recommended methods (Cella et al., 1998; Dapuerto et al., 2003). The Spanish version of the FACT-G (v.4) has demonstrated both construct validity and evidence of strong internal consistency reliability ($\alpha=0.89$) in various groups of Spanish-speaking oncology patients (Cella et al., 1998; Dapuerto et al., 2003; Dapuerto, Servente, Francolino, & Hahn, 2005).

FACIT-Spiritual—The FACIT-Spiritual subscale is a 12-item measure of spiritual well-being developed for patients with chronic illnesses, including cancer (Andersen et al., 2007; Peterman, Fitchett, Brady, Hernandez, & Cella, 2002). Respondents indicate their agreement with items assessing existential, spiritual, and religious well-being using a 5-point Likert scale. The scores range from 0–48, with higher scores indicating better SpWB. Evidence of internal consistency reliability ($\alpha=0.85$) and construct validity have been previously documented (Peterman et al., 2002). In this study, the sample coefficient alpha was 0.90 for the SpWB subscale. Three factors, Meaning, Peace, and Faith, can be calculated, and have shown to exert a distinct influence various health outcomes (Murphy et al., 2010; Peterman et al., 2014). The score ranges for each of the three SpWB factors range from 0–16. In this study, the internal consistency reliability coefficient alphas for the Meaning, Peace, and Faith scales were 0.83, 0.83, and .88 respectively. The SpWB subscale has been translated into Spanish, and has shown evidence of reliability and validity in Spanish-speaking cancer patients (Peterman et al., 2002).

Acculturation—The Short Acculturation Scale is a 4-item questionnaire that assesses Spanish and English language usage in respondents' daily lives (Wallen, Feldman, & Anliker, 2002). Responses indicate self-reported language acculturation, which may reflect the degree to which Hispanic participants identify with their native cultures versus their non-native host cultures (Norris, Ford, & Bova, 1996). Each item is scored from 1 (speaks Spanish all the time) to 5 (speaks English all the time). Scores range from 4–20; higher scores reflect greater acculturation. In this study, the internal consistency reliability coefficient alpha was 0.99.

Statistical Analysis

Descriptive statistics were used to summarize demographic and clinical characteristics. SpWB scores were trichotomized based on the observed range of scores in the sample, creating three tertiles for examining associations with HRQL. Differences in SpWB scores between groups based on Hispanic vs. non-Hispanic ethnicity, and those of historical controls, were examined using parametric statistics when data were normally distributed, and non-parametric tests when normality assumptions were not met. To estimate internal consistency reliability, Cronbach's formula for coefficient alpha was computed for the FACT-G, FACIT-Spiritual and the subscales of both measures.

To examine differences in SpWB between Hispanic and non-Hispanic participants, an ANCOVA was performed, controlling for gender and education. The decision to include gender and education as covariates was decided a priori to permit comparison with a previously published result from a healthy control sample (Andrykowski et al., 2005). Bivariate correlations were computed between additional demographic (age, marital status, acculturation, and labor status) and clinical [years since transplant, transplantation risk status, primary disease, intensity of conditioning, stem cell source, HLA compatibility, evidence of disease (receiving treatment for disease relapse), disease status, treatment status, intensity of immunosuppression and cGVHD severity] factors to assess for additional covariates.

A general linear regression model was performed to examine if SpWB predicted HRQL as measured by FACT-G. The relationship between FACT-G and all demographic and clinical variables was assessed to determine if additional variables should be included as covariates in the model. The Jonckheere-Terpstra test (Jonckheere, 1954) was used to evaluate whether HRQL scores increased monotonically across tertiles of increasing SpWB. Analyses were performed using the Statistical Package for the Social Sciences (SPSS®) Version 21 software (SPSS Inc., Chicago, IL, USA). All tests were two-tailed (except for one-sided Jonckheere-Terpstra test), and p values less than 0.05 were considered statistically significant.

Results

Demographic characteristics of Hispanic [$n=69$, (40.4%)] and non-Hispanic [$n=102$ (59.6%)] participants are presented in Table 1. Compared to their non-Hispanic counterparts, Hispanics were significantly younger ($M=47.95\pm13.1$ vs. 39.5 ± 12.4 , $p<0.001$, respectively) and had lower levels of educational attainment ($X^2=8.45$ (3), $p=0.004$). A majority of Hispanic participants had been born outside the US, with 30.9% from South America, 23.5% from Mexico, and 22.1% from Central America. A majority of the non-Hispanic participants (65.0%) were born in the US. Hispanic participants reported a very low level of acculturation (Table 1), suggesting preferences to think in Spanish. and to speak Spanish at home and when interacting with friends. Hispanic subjects were mostly Christian-Catholic (79.7%) while Non-Hispanic subjects were more diverse in their religious affiliation; a majority were Christian-Protestant (45.1%).

Transplant survivors in this study were a median of 4 years (range 3–16) from allogeneic HSCT (Table 2). The primary diseases varied between the two groups ($X^2=24.96$ (5), $p=0.016$), and this variation is also reflected in between-group differences in the intensity of pre-transplant conditioning regimens ($X^2=18.38$ (1), $p=0.004$). In general, the non-Hispanic group were more likely to have a diagnosis of lymphoma, multiple myeloma or solid tumor (37.3%), and thus more likely to have received a reduced-intensity pre-transplant conditioning regimen (57.8%). The Hispanic group was more likely to have a diagnosis of acute or chronic leukemia (72.4%), and therefore more likely to have received a myeloablative conditioning preparative regimen (75.4%). Hispanics were more likely to have a preserved performance status with an ECOG 0 (97.1%) and be in a complete remission, while among non-Hispanics, approximately one third (30.4%) had an ECOG performance status of 1 or 2 ($X^2=19.98$ (1), $p<0.001$), indicating more functional limitations, and approximately one third had evidence of recurrent malignancy and were receiving treatment for disease relapse.

Ethnicity and Spiritual Well-Being

Bivariate analysis revealed that demographic and clinical factors were not related to SpWB (all $p>0.05$); therefore only gender and education, as specified a priori, were included as covariates in the model. The ANCOVA, controlling for the possible effects of gender and education, found that Hispanic survivors reported significantly higher levels of SpWB compared to their non-Hispanic counterparts ($F=4.96$, $df=1,160$, $p=0.03$) (Table 3). In terms

of the three components of SpWB, Hispanic survivors reported higher levels of Meaning ($F=5.24$, $df=1$, 162 , $p=0.023$) and Faith ($F=5.11$, $df=1$, 160 , $p=0.025$), compared to non-Hispanic survivors, while there was no difference in the Peace ($F=1.36$, $df=1$, 162 , $p=0.25$) dimension.

Hispanic and non-Hispanic transplant survivor SpWB scores were also compared to those of a historical sample of healthy controls reported by Andrykowski et al. (Andrykowski et al., 2005) using a two sample t-test. The non-Hispanic group had a level of SpWB comparable to the healthy sample ($t=0.87$, $df=255$, $p=0.38$), while the Hispanic group reported SpWB scores that were significantly higher than the healthy sample ($t=3.19$, $df=223$, $p=0.002$).

Spiritual Well-Being and HRQL

Despite a significant difference in SpWB scores between Hispanic and non-Hispanic survivors, FACT-G scores were not significantly different [$t=0.591$ (166); $p=0.55$]. Therefore, data were pooled for the HRQL analyses. Demographic and clinical variables were not significantly associated with FACT-G scores, except for employment ($p=0.01$) and ECOG performance status ($p<0.001$). In a regression model that controlled for employment and performance status, SpWB subscales, specifically Meaning ($p<0.01$) and Peace ($p<0.001$), but not Faith were significant independent predictors of HRQL (Table 4).

To further explore this relationship and to characterize the SpWB of those respondents with the lowest levels of SpWB, SpWB was trichotomized based on the distribution of SpWB scores in the sample. The lowest tertile had SpWB scores 38 ($n=56$), the middle tertile reported scores ranging from 39–44 ($n=53$), and the highest tertile had scores 45 ($n=57$). There was a significant decrease in FACT-G total and subscales scores across all three SpWB tertiles ($F=43.93$, $df=2,157$, $p<0.001$) (Table 5).

Those with the lowest levels of SpWB had significantly lower FACT-G total scores ($p<0.05$) and Emotional Well-Being scores ($p<0.001$), but comparable Physical, Functional, and Social-Family Well-Being scores, compared to adult US General Population norms. Survivors with the highest SpWB reported FACT-G total and subscale scores significantly higher than healthy population norms ($p<0.01$), and had statistically significantly better Functional and Social-Family Well-Being, compared to those in the middle tertile ($p<0.01$). Additionally, participants in the middle tertile also reported significantly higher FACT-G, Functional, and Social-Family Well-Being scores than the healthy group ($p<0.001$).

Discussion

Consistent with prior studies that demonstrate Hispanic cancer patients have higher levels of spiritual well-being compared to their non-Hispanic counterparts (Ashing-Giwa et al., 2004; Juarez, Ferrell, & Borneman, 2001; Levine et al., 2007; Wildes, Miller, San Miguel de Majors, & Ramirez, 2008), we observed that Hispanic HSCT survivors, a median of 4 years following transplant, have higher levels of spiritual well-being compared to non-Hispanic HSCT survivors, and a sample of healthy individuals. Spiritual well-being in the non-Hispanic HSCT survivors was comparable to values derived from the comparison group which was primarily White (95%) and non-Hispanic. This is similar to a previous study

where HSCT survivors reported similar spiritual well-being to the healthy controls despite reports of significant growth and benefit following the transplant experience (Andrykowski et al., 2005).

The findings reported here suggest that greater spiritual well-being may not be a universal experience for all HSCT survivors, and there may be variability in this important coping resource among subgroups (e.g. Hispanics) that are known to rely on religiosity and spiritual coping (Canada et al., 2013). More specifically, Hispanic HSCT survivors in this study reported higher levels of meaning and faith compared to their non-Hispanic counterparts. These findings are consistent with the observations of other investigators who have noted that Hispanic cancer survivors report higher levels of faith than European-American survivors, reflecting greater engagement in both organized and informal religious activities (Peterman et al., 2002). Participating in organized and informal religious activities is a commonly known aspect of Catholicism which describes nearly 80% of the Hispanic survivors in this sample. However, higher scores on the subscales of Faith and Meaning in the Hispanic survivors did not translate into better HRQL. This fits with published evidence indicating that Faith has an inconsistent relationship with HRQL, while Peace, which in our study was not significantly different between the groups, has a more consistent positive association with HRQL (Bai & Lazenby, 2014).

In this study, irrespective of ethnic background, HSCT survivors with greater spiritual well-being reported better HRQL than the US general population. Higher scores on the Meaning and Peace subscales accounted for the higher levels of HRQL reported by transplant survivors. This supports previous research findings that cancer patients reporting higher levels of spiritual well-being also reported a level of HRQL that was better than a healthy comparison sample (Ashing-Giwa et al., 2004; Juarez et al., 2001; Krupski et al., 2006; Wildes et al., 2008). In our study, survivors with the lowest levels of spiritual well-being reported clinically significant impairments in overall HRQL when compared to the general population, specifically related to emotional well-being.

Although transplant survivors may report post-traumatic growth and benefit-finding following intense cancer treatment, our findings and those of others suggest that spiritual well-being may serve to bolster HRQL (Andrykowski et al., 2005). Therefore, assessment of spiritual well-being is a critical component of survivorship care and is in alignment with broader recommendations to include assessment of spiritual needs in a number of medical settings (www.jointcommission.org/Standards/Requirements). Interventions that support spiritual well-being may include active listening, counseling, encouraging spiritual practices such as prayer, journaling, mindfulness, reflection and participation in a faith community (Fish, Ettridge, Sharplin, Hancock, & Knott, 2014; Oh & Kim, 2014). In busy practice settings, there may be limited available time to address spiritual needs. Brief screening measures to determine an individual's spiritual needs for application in clinical practice are being studied (Blanchard, Dunlap, & Fitchett, 2012). However, referrals to supportive care services should be considered if an individual struggles to find meaning in the context of their cancer survivorship experience.

Our study results are consistent with those of other investigators who also observed an association between higher levels of spiritual well-being and more favorable HRQL (Molina et al., 2014). Adelstein et al (2014) have suggested that meaning-making interventions for HSCT recipients may have an important role in reducing psychological morbidity, and improving HRQL and coping (Adelstein, Anderson, & Taylor, 2014; Scheffold et al., 2014). However, the effects on SpWB and HRQL of meaning-making interventions tested in the context of end-of-life care (Breitbart, Gibson, Poppito, & Berg, 2004; Breitbart et al., 2012) have not been evaluated for their effectiveness in HSCT survivors, though studies in cancer survivors are currently underway (van der Spek et al., 2014; van der Spek et al., 2013). Our findings support the provision of interventions to enhance a sense of meaning that include meaning-making, since this component of spirituality, not influenced by ethnicity in this sample, may enhance HRQL. (Ross, Hall, Fairley, Taylor, & Howard, 2008) In addition, the optimal timing for the assessment of spiritual well-being and the delivery of interventions to strengthen this important coping resource are important topics for future study.

Conclusion

Allogeneic HSCT is an intensive treatment approach for life-threatening hematologic disorders, and can significantly alter an individual's life perspective. This study suggests that despite the challenges of their illness experience, Hispanic survivors enjoyed greater spiritual well-being compared to their non-Hispanic counterparts, and thus may possess an important resource for resilient coping. Future studies are needed to determine if interventions to enhance spiritual well-being have a direct effect on HRQL outcomes in long-term transplant survivors, irrespective of ethnicity. Transplant providers should also recognize the value of spiritual well-being as a coping resource, and provide interventions that offer opportunities to create meaning, promote a sense of peace, and allow for stronger connections to faith practices.

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TABLE 1

Demographic characteristics of allogeneic HSCT recipients (N=171).

Demographic Characteristics	Hispanic (n=69) n (%)	Non-Hispanic (n=102) n (%)
Age * (years), Mean (SD)	39.5 (12.4)	47.95 (13.1)
[Range]	[19–69]	[19–76]
Gender (male)	38 (55.1)	69 (67.7)
Race		
White	24 (35.3) ²	65 (63.7)
Black	--	15 (14.7)
Asian	--	18 (17.6)
Other	44 (64.7) ²	4 (3.9)
Marital Status (married)	43 (62.3)	66 (65.3) ^I
Religion		
Christian - Catholic	55 (79.7)	28 (27.5)
Christian - Protestant	12 (17.4)	46 (45.1)
Christian - Other	--	3 (2.9)
Hindu	--	6 (5.9)
Islam	--	6 (5.9)
Jewish	--	1 (1.0)
No religion	2 (2.9)	9 (8.8)
Other	--	3 (2.9)
Education *		
High-School Graduate	27 (39.7) ²	21 (20.8) ^I
Some College/Associate's Degree	19 (27.9) ²	24 (23.8) ^I
Bachelor's Degree	9 (13.2) ²	26 (25.7) ^I
Graduate	13 (19.1) ²	30 (29.7) ^I
Employment *		
Full-time, Part-time, or Student	51 (73.8)	66 (66.0) ³
Not Working	18 (26.1)	34 (34.0) ³
Region Born		
North America		
United States	6 (8.8) ²	65 (65.0) ³
Mexico	16 (23.5) ²	--
Central America	15 (22.1) ²	--
Caribbean	6 (8.8) ²	1 (1.0) ³
South America	21 (30.9) ²	1 (1.0) ³
Asia	--	16 (16.0) ³
Africa	--	7 (7.0) ³
Other	4 (5.9) ²	10 (10.0) ³

Demographic Characteristics	Hispanic (n=69) n (%)	Non-Hispanic (n=102) n (%)
Acculturation Scale Score, Mean (SD)	5.3 (2.4)	--
[Range]	[1–13]	--
Residency		
Always in United States	5 (7.4) ²	63 (63.6) ⁴
Stayed in United States after HSCT	22 (32.4) ²	20 (20.2) ⁴
Left United States after HSCT	41 (60.3) ²	16 (16.2) ⁴

HSCT, hematopoietic stem-cell transplantation.

¹
n=101,

²
n=68,

³
n=100,

⁴
n=99.

*
 $p < 0.05$.

TABLE 2

Clinical characteristics of allogeneic HSCT recipients (N=171).

Clinical Characteristics	Hispanic (n=69) n (%)	Non-Hispanic (n=102) n (%)
Primary Disease		
Acute Leukemia	23 (33.3)	10 (9.8)
Chronic Leukemia	27 (39.1)	35 (34.3)
Lymphoma/Multiple Myeloma	6 (8.7)	33 (32.4)
Myelodysplastic Syndrome	5 (7.3)	12 (11.8)
Non-Hematological Malignancy/Solid Tumor	8 (11.6)	12 (11.8)
Evidence of Disease**	6 (8.7)	28 (27.5)
ECOG Performance Status***		
Grade 0	67 (97.1)	71 (69.6)
Grade 1 or 2	2 (2.9)	31 (30.4)
Conditioning Regimen***		
RIC	17 (24.6)	59 (57.8)
Myeloablative	52 (75.4)	43 (42.2)
Stem Cell Source		
Peripheral Blood	68 (98.6)	98 (96.1)
Bone Marrow	1 (1.5)	4 (3.9)
Donor-Recipient HLA Compatibility		
HLA-Matched Sibling	68 (98.6)	101 (99.0)
Syngeneic	1 (1.5)	1 (1.0)
Time since HSCT (years), Mean (SD)	5.29 (3.3)	5.05 (2.7)
[Range]	[3–16]	[3–14]
Median	4	4

ECOG, Eastern Cooperative Group Status; RIC, reduced intensity conditioning; HLA, human leukocyte antigen; HSCT, hematopoietic stem-cell transplantation.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.

TABLE 3FACIT-Spiritual Well-being^a scores by group.

Measure/Subscales	Hispanic (n=69) Mean (SE)	Non-Hispanic (n=102) Mean (SE)	Healthy Sample (N=158) ^b Mean (SE)
FACIT-Spiritual Well-Being *	41.5 (1.1)	38.4 (0.9)	37.4 (0.7)
Meaning [†]	14.5 (0.4)	13.5 (0.3)	
Peace	12.7 (0.4)	12.0 (0.4)	
Faith [†]	14.3 (0.5)	12.9 (0.4)	

FACIT, Functional Assessment of Chronic Illness Therapy.

^a ANCOVA controlling for gender and education.^b reference values from Andrykowski et al., 2005(Andrykowski et al., 2005).* $p < 0.05$,[†] $p = 0.025$.

TABLE 4

Regression Analysis (n = 171)

Parameter	<i>B</i>	Std. Error	<i>t</i>
Intercept	34.430	4.679	7.359***
Covariates			
Employment: not working ¹	-2.713	1.956	-1.387
ECOG: 0 ²	7.441	2.310	3.221**
FACIT-Sp			
Faith	0.361	0.294	1.229
Peace	1.951	0.361	5.408***
Meaning	1.323	0.448	2.955**

ECOG, Eastern Cooperative Oncology Group. FACIT-Sp, Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being.

**
 $p < 0.01$,***
 $p < 0.001$.¹Reference group – working/student;²Reference group – ECOG 1.

TABLE 5Health-related quality of life scores (n=166[†]) by level of spiritual well-being (SpWB)

Variables	SpWB Lowest Tertile (n=56)	SpWB Middle Tertile (n=53)	SpWB Highest Tertile (n=57)	Adult US General Population ^a (n=1075)
FACT-G ^b	74.0 (16.9) *	91.0 (10.7)	96.0 (9.5)	80.1 (18.1)
Physical Well-Being ^c	21.8 (4.9) *	23.9 (4.1)	24.6 (4.0)	22.7 (5.4)
Functional Well-Being ^c	17.7 (6.1) **	22.9 (4.0)	24.8 (3.7)	18.5 (6.8)
Emotional Well-Being ^d	16.8 (4.8) **	20.8 (2.7)	21.7 (2.3)	19.9 (4.8)
Social-Family Well-Being ^c	18.7 (5.9) **	23.3 (4.3)	25.0 (3.6)	19.1 (6.8)

SpWB, Spiritual Well-Being; FACT-G, Functional assessment of cancer therapy.

[†] n=5 with missing/incomplete subscales data were excluded,^a Brucker et al., 2005(Brucker et al., 2005),^b Higher scores indicate better HRQL, range 0–108,^c range 0–28,^d range 0–24.* $p < 0.01$, compared to middle and high SpWB,** $p < 0.001$, compared to middle and high SpWB.