



Familism, family cohesion, and health-related quality of life in Hispanic prostate cancer survivors

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Abstract

Background Familism, the cultural value that emphasizes feelings of loyalty and dedication to one's family, has been related to both positive and negative outcomes in Hispanic cancer survivors. One potential source of observed inconsistencies may be limited attention to the family environment, as familism may be protective in a cohesive family whereas it can exacerbate distress in a conflictive family.

Purpose The current study explored the associations of familism with general and disease-specific health-related quality of life (HRQoL) in Hispanic men who completed prostate cancer (PC) treatment, and whether family cohesion may help explain these relationships.

Methods Hispanic men treated for localized PC (e.g., radiation, surgery) were enrolled in a randomized controlled stress management trial and assessed prior to randomization. Familism (familial obligation) was assessed using Sabogal's Familism Scale and family cohesion was measured using the Family Environment Scale (ranging from high to low). The sexual, urinary incontinence, and urinary obstructive/irritative domains of the Expanded Prostate Cancer Index Composite – Short Form measured disease-specific HRQoL. The physical, emotional, and functional well-being subscales of the Functional Assessment of Cancer Therapy – General captured general HRQoL. Hierarchical linear regression and the SPSS PROCESS macro were used to conduct moderation analyses, while controlling for relevant covariates.

Results Participants were 202 older men on average 65.7 years of age ($SD=8.0$) who had been diagnosed with PC an average of 22 months prior to enrollment. Familism was not directly associated with general and disease-specific HRQoL. Moderation analyses revealed that greater familism was related to poorer urinary functioning in the incontinence ($p=.03$) and irritative/obstructive domains ($p=.01$), and lower emotional well-being ($p=.02$), particularly when family cohesion was low.

Conclusions These findings underscore the importance of considering contextual factors, such as family cohesion, in understanding the influence of familism on general and disease-specific HRQoL among Hispanic PC patients. The combined influence of familism and family cohesion predicts clinically meaningful differences in urinary functioning and emotional well-being during the posttreatment phase. Culturally sensitive psychosocial interventions to boost family cohesion and leverage the positive impact of familistic attitudes are needed to enhance HRQoL outcomes in this population.

Keywords Familism · Family cohesion · Hispanic · Prostate cancer · Health-related quality of life

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Introduction

As one of the fastest growing and largest minority ethnic groups in the United States, the Hispanic/Latino population (hereafter Hispanic) is expected to reach 111 million by 2060 (US Census Bureau, 2018). Cancer is the leading cause of death among Hispanics, with prostate cancer (PC) being the second leading cause of cancer death among Hispanic men (American Cancer Society, 2021). Around 66% of PC cases in Hispanic men are diagnosed at a localized stage, with a 5-year survival rate of >99% (American Cancer Society, 2021). High survival is offset by acute and chronic treatment side effects, such as sexual and urinary dysfunction, pain, and fatigue, which can compromise health-related quality of life (HRQoL) and can persist for years after diagnosis (Davis et al., 2014; Selli et al., 2014). Relative to non-Hispanic White (NHW) men, Hispanic and African American men have more difficulty recovering to baseline functioning and have a higher risk of getting diagnosed with more advanced PC, independent of age and socioeconomic status (Hoffman et al., 2001; Lubeck et al., 2001). Given the increasing number of Hispanic PC survivors living with residual treatment side effects, further research is needed to understand the determinants of PC outcomes among Hispanics in the U.S.

Hispanic men with PC have significant difficulties adjusting to treatment-related changes. The number of studies that examine HRQoL in Hispanics with PC is limited and among those that do, Hispanic men exhibit lower HRQoL than NHW men (Krupski et al., 2005b; Penedo et al., 2006a). For instance, in a sample of low-income men with localized PC, Hispanics reported worse sexual, physical, and bowel function than African American and NHW men, even after adjusting for medical and sociodemographic factors (Krupski et al., 2005b). Additionally, Hispanics have more frequently reported moderate to severe problems with sexual function and incontinence at 6 and 12 months posttreatment relative to African American and NHW men (Johnson et al., 2004). Furthermore, Hispanic ethnicity has been independently associated with worse mental health compared to NHW race and Black ethnicity (Gore et al., 2005), as well as worse physical and emotional functioning in PC patients with varying stages of disease (Krupski et al., 2005a). The association between Hispanic ethnicity and lower HRQoL in PC has been shown to be influenced by sociodemographic (e.g., household income), medical (e.g., medical co-morbidities), and health behavior factors, such as sleep functioning and physical activity (Penedo et al., 2006a). In light of the observed ethnic disparities, additional research is necessary to determine the Hispanic-specific factors that contribute to variations in HRQoL.

Understanding PC outcomes among Hispanics remains a challenge, as the current literature predominantly consists of studies targeting NHWs (Yanez et al., 2016). Yanez and colleagues' conceptual model of determinants of cancer outcomes in Hispanics highlights the importance of cultural factors in understanding cancer outcomes in the United States (Yanez et al., 2016). According to this model, Hispanic cultural and ethnic factors may influence and interact with socioeconomic, psychosocial, health care, disease-specific, and medical factors known to influence cancer outcomes (morbidity, mortality, HRQoL). The application of this model to PC may provide insights into how cultural and psychosocial factors interact and influence HRQoL.

The Hispanic population is notably diverse, yet it shares several cultural values that hold significance for health outcomes (Gallo et al., 2009; Marin & Marin, 1991). One significant value in Hispanic culture is familism, which encompasses loyalty, reciprocity, and dedication to one's nuclear and extended family members (Sabogal et al., 1987), as well as prioritizing the needs of the family before one's own (Santisteban et al., 2002). Familism is a construct that measures an individual's beliefs and attitudes on various aspects: (a) perceived support from the family; (b) familial obligation, which is the perceived obligation to provide emotional and material support to family; and (c) family as referents, which is the degree to which one maintains behaviors that are consistent with family expectations and values (Sabogal et al., 1987). The existing literature has provided mixed findings regarding the relationship between familism and cancer outcomes, with both positive and negative associations reported. Familism has been found to facilitate family support in cancer patients undergoing treatment (Ashing-Giwa et al., 2006), encourage seeking medical care (Tamez, 1981), and promote better HRQoL among Latina breast cancer patients (Graves et al., 2012). It has also been associated with better emotional well-being in Hispanic PC patients before undergoing active treatment (Bustillo et al., 2017). However, familism may discourage patients from making positive behavioral changes that do not appear to benefit their family (Ashing-Giwa et al., 2006). The varying results emphasize the importance of taking contextual factors into account when investigating the association between familism and HRQoL.

Within the Hispanic culture, it is theorized that familism promotes close, supportive family interactions and behaviors (Campos et al., 2008). However, familism alone may not suffice to promote favorable cancer outcomes, as the environment in which it is enacted also plays a critical role. Certain family contexts may hinder the positive influence of familism on cancer outcomes (Gallo et al., 2009). For instance, family conflict or lack of proximity to family networks may hinder the enactment of familism and reduce

its potential benefits. In certain Hispanic family contexts, there may be a strong cultural emphasis on family obligation and responsibility to care for one another. Family members may prioritize the needs of the cancer patient over their own, leading to increased burden and stress for the caregivers. Furthermore, the interdependence of family members in these contexts can make it difficult for patients to prioritize their own health needs, as they may feel guilty about burdening their family or fear being seen as selfish. At present, it remains uncertain whether familism's protective effects are contingent upon a cohesive family environment characterized by strong emotional bonds, regular positive interactions, and collaborative problem-solving. Family cohesion is likely to moderate the relationship between familism and HRQoL, as it encompasses the desired family dynamic aligned with familism values and has the potential to enhance HRQoL outcomes.

Given the importance of familism in Hispanic culture and the mixed findings on its impact on cancer outcomes, it is important to further investigate the relationship between familism and HRQoL among Hispanic PC patients. Additionally, exploring the moderating role of family cohesion in this relationship may shed light on potential protective factors that could be leveraged to improve patients' health outcomes. Such knowledge may support the development of culturally sensitive interventions that harness the strengths of familism and promote family-centered approaches to PC care for Hispanic men and their families.

Building on a conceptual model of determinants of cancer outcomes in Hispanics (Yanez et al., 2016), the current study explored the associations of familism (familial obligation) with general and disease-specific HRQoL in Hispanic men who completed PC treatment. Additionally, moderation analyses tested whether the relationship between familism and HRQoL varies by level of family cohesion. Our hypothesis posited a positive association between familism and both general and disease-specific HRQoL, with stronger effects expected when there is greater family cohesion. Conversely, we also anticipated that familism would be associated with poorer HRQoL when family cohesion is low.

Methods

Participants and procedures

PC patients were enrolled between October 2017 and February 2023 in a multi-site, randomized controlled behavioral clinical trial (NCT03344757) that evaluated whether participation in a culturally adapted cognitive behavioral stress management (C-CBSM) intervention led to significantly reduced symptom burden and improvements

in HRQoL compared to participation in a non-culturally adapted cognitive behavioral stress management (CBSM) intervention (Penedo et al., 2018). Eligible participants were Spanish-speaking (including English-Spanish bilinguals), self-identified Hispanic/Latino adults with localized to locally advanced prostate cancer (stages I to IIIA) who had completed surgical or radiation treatment within the past 8 years. Exclusion criteria included a history of other non-skin cancer within the last 2 years, active alcohol or substance dependence, prior inpatient psychiatric treatment for severe mental illness or overt signs of severe psychopathology within the past six months, scores of > 3 on the Short Portable Mental Status Questionnaire (Pfeiffer, 1975), or acute or chronic immune system illness, medications or conditions that impact immune and endocrine function (e.g., CFS, Lupus, Hepatitis C, rheumatoid arthritis, or immunosuppressive treatment requiring conditions). The current study is limited to data from the baseline assessment (i.e., pre-randomization).

This study complied with regulations of the Sylvester Comprehensive Cancer Center Protocol Review Committee and Institutional Review Boards of the University of Miami and Northwestern University. Patients of diverse Hispanic backgrounds were recruited from the Robert H. Lurie Comprehensive Cancer Center at Northwestern Memorial Hospital and the Sylvester Comprehensive Cancer Center of the University of Miami. Additionally, patients were recruited from a list of potential participants meeting our study criteria provided by the Florida Cancer Data System (FCDS). Informed consent was obtained in person or remotely at the beginning of the baseline assessment meeting. During this initial meeting, participants completed a psychosocial interview in Spanish and were compensated \$75. All research data were collected and managed using REDCap electronic data capture tools hosted at the University of Miami and Northwestern University (Harris et al., 2009, 2019; Obeid et al., 2013).

Measures

Familism. The 6-item familial obligation factor of Sabogal's Familism scale (Sabogal et al., 1987), was used as an indicator of familism. While the term "familism" is used throughout our manuscript to maintain consistency with existing literature, it specifically denotes familial obligation. Participants rated each item on a 5-point Likert scale to indicate agreement or disagreement (1 = *strongly agree* to 5 = *strongly disagree*). The subscale assesses the perceived obligation to provide emotional and material support to family (e.g., "one should help economically with the support of younger brothers and sisters"). Responses were reverse coded such that higher scores indicate higher familism.

Adequate internal consistency ($\alpha=0.71$) was found among a diverse population-based sample of Hispanics (Campos et al., 2019). The current sample also demonstrated acceptable internal consistency ($\alpha=0.66$). The Familism scale has been translated to Spanish (Sabogal et al., 1987) and shown to have factorial invariance across English and Spanish versions (Campos et al., 2019).

Disease-specific HRQoL. The sexual, urinary incontinence, and urinary obstructive/irritative domains of the Spanish version of the Expanded Prostate Cancer Index Composite – Short Form (EPIC-26) measured PC-specific symptom burden (Ferrer et al., 2009; Wei et al., 2000). Participants rated each item using a 4- or 5-point Likert scale to indicate symptom frequency and severity. After reverse-coding several items, all scores were transformed linearly to a 0–100 scale, with higher scores representing better urinary and sexual functioning. Domain scores below 80 are generally indicative of poor urinary or sexual functioning (Lavana et al., 2019). Acceptable reliability ($\alpha=0.66–0.89$) has been found on the Spanish version of this scale (Ferrer et al., 2009) and the current sample ($\alpha=0.87, 0.62, \text{ and } 0.88$ for urinary incontinence, urinary irritative/obstructive, and sexual functioning, respectively).

General HRQoL. The Functional Assessment of Cancer Therapy – General (FACT-G) was used to measure general HRQoL (Bonomi et al., 1996; Cella et al., 1993; Esper et al., 1997). Individual components of HRQoL were estimated, rather than a composite score, as they may be more sensitive to capturing quality of life and varying levels of functioning across domains. For the present analysis, we used the physical, emotional, and functional well-being subscales, with higher scores in these domains indicating better HRQoL. The social/family well-being subscale was excluded from the analyses due to conceptual overlap with the family cohesion items. Participants rated each item on a 5-point Likert scale ranging from *not at all* to *very much* to indicate the extent to which each item applied to them in the past 7 days. Adequate internal consistency ($\alpha=0.66–0.83$) among FACT-G subscales in Spanish has been demonstrated (Cella et al., 1998). Similarly, the current sample showed acceptable internal consistency ($\alpha=0.73, 0.63, 0.81$ for physical, emotional, functional well-being, respectively).

Family cohesion. Participants' perception of their current family environment was measured using the family cohesion subscale of the Family Environment Scale – Spanish version (Moos & Moos, 1994). Family cohesion refers to the degree of support and commitment family members provide for each other. Patients indicated whether each item was true or false for their family. Greater frequency of *true* statements indicates higher family cohesion. A low score on this measure indicates a sense of disconnection, limited closeness, poor communication, and inadequate support among

family members. The subscale has shown adequate internal consistency ($\alpha=0.78$) among Mexican American adults (Negy & Snyder, 2006) and the current sample ($\alpha=0.77$).

Covariates. Sociodemographic covariates included age, education, income, marital status, and neighborhood disadvantage. The latter was measured using the Area Deprivation Index (ADI), which is a valid, neighborhood-level composite index that captures 17 dimensions of social determinants of health within the domains of housing, income, employment, and education (Kind & Buckingham, 2018). Scores on the ADI state rankings range from 1 to 10, with higher scores indicating greater disadvantage. To determine the ADI composite score at the census block group level, the ADI mapping atlas and participant addresses at baseline were used. Medical covariates included time since treatment ended, treatment type (i.e., surgery or radiotherapy), fatigue, and medical comorbid conditions. Fatigue symptoms were measured using the Patient-Reported Outcomes Measurement Information System (PROMIS) Fatigue computerized adaptive testing (Cella et al., 2010). Medical comorbidities were captured using the Charlson Comorbidity Index (Charlson et al., 1994), which consists of 13 medical conditions that have an associated weight based on mortality risk. The sum of all weights results in a comorbidity score. Covariates were selected based on previous literature suggesting a link between these factors and general and PC-specific HRQoL (Chambers et al., 2017; Monga et al., 2005; Song et al., 2023).

Statistical methods

All analyses were performed in IBM SPSS software Version 28 (IBM Corp., 2021). Cronbach's alpha reliability coefficients were derived and assessed for each scale. If internal consistency was questionable ($\alpha<0.7$), inter-item correlations per factor were examined (Streiner, 2003). The normality of variables was tested by assessing their skewness and kurtosis. Variables exhibiting skewed distributions, indicated by an absolute skew index greater than 3.0 or absolute kurtosis index greater than 8, were subjected to a square transformation. Normality testing revealed normal distributions for most study variables, except for family cohesion and the EPIC-26 subscales (i.e., urinary incontinence, urinary irritative/obstructive, and sexual functioning) which demonstrated negatively skewed distributions. To address this skewness, a square transformation was applied to these variables, resulting in a more normalized distribution. The square transformation was chosen due to its ability to accommodate values of 0 and its effectiveness in normalizing negatively skewed distributions with smaller variance at the upper end of the distribution (Ferketich &

Verran, 1994). In addition, multicollinearity was not a concern in this study as all VIF values were less than 1.3.

Inter-item reliability analyses were conducted for the familism ($\alpha=0.66$), urinary irritative/obstructive ($\alpha=0.62$), and emotional well-being ($\alpha=0.63$) scales. No items were excluded from the familism and urinary irritative/obstructive scales since all items exhibited significant correlations with other items within each respective scale. Within the six-item emotional well-being subscale, one item (“I am satisfied with how I am coping with my illness”) did not demonstrate significant correlations with four other items ($r_s < 0.15$, $p_s > 0.06$). Excluding this item resulted in a similar acceptable internal consistency ($\alpha=0.66$), thus the item was not removed from the emotional well-being scale.

Covariate selection was performed using both empirical and theoretical approaches. Empirically, potential sociodemographic and medical covariates were identified through bivariate correlations and one-way analyses of variance with all outcome variables. Variables showing a correlation of $p < .10$ were considered for inclusion in the model, allowing for the consideration of variables that may have practical or theoretical importance, even if they did not meet the stricter threshold for traditional statistical significance ($p < .05$). Theoretical considerations were also taken into account, with variables selected based on their potential relevance to the outcome variable according to existing literature and theoretical frameworks.

Table 1 Sociodemographic and Medical Characteristics ($N=202$)

Variable	M (SD); n (%)
Age (years)	65.7 (8.0)
Time since treatment ended (months)	22.0 (24.7)
Medical co-morbidity	2.6 (1.3)
Years living in the United States	31.3 (19.6)
Educational history	
<High school	18 (8.9)
High school or equivalency (GED)	33 (16.4)
Vocational school	14 (6.9)
Bachelor’s degree	112 (55.4)
Graduate degree	25 (12.4)
Average household income	
Unemployed or retired	29 (14.4)
<\$16,000	28 (13.9)
\$16,000 - \$34,999	24 (11.9)
\$35,000 - \$74,999	30 (14.9)
\$75,000 - \$99,999	15 (7.4)
≥\$100,000	39 (19.3)
Missing or declined to answer	37 (18.3)
Marital status	
Married or similar relationship	134 (66.3)
Not married	68 (33.7)
Treatment type	
Surgery	159 (78.7)
Radiation	43 (21.3)

Separate hierarchical linear regression models for each outcome were used to assess the relationships between familism and general and disease-specific HRQoL. Statistical tests were two-tailed with a significance level set at $p < .05$. In each model, covariates were entered in Step 1 and familism in Step 2. Subsequently, moderation analyses were conducted using Model 1 of Hayes’s SPSS PROCESS macro (Hayes, 2017) to examine the potential moderating effects of family cohesion on the relationship between familism and HRQoL. The PROCESS macro employs bootstrapping procedures (i.e., 5000 resamples used here) to generate bias-corrected confidence intervals and test the significance of the conditional effects (Hayes, 2017). Both predictors were centered to reduce multicollinearity and aid in the interpretation of results (Aiken et al., 1991). The Johnson-Neyman technique was used to report and visualize observed moderation, which helps examine the variability of the main effect across the entire spectrum of moderator values within a single regression line (Johnson & Neyman, 1936). Unlike traditional simple slopes analyses (Aiken et al., 1991), which examine the conditional effect at specific points (e.g., ± 1 SD), the Johnson-Neyman interval identifies the two specific values of the moderator at which the slope of the predictor goes from non-significant to significant. The *Johnson-Neyman()* function in the *interaction* package for RStudio version 4.2.1 was used to generate the interaction figures (Long, 2019; R Core Team, 2022).

Results

Sample characteristics

Participants were 202 men ($M_{\text{age}} = 65.7$ years, $SD=8.0$, range=44–90) who had been diagnosed with PC an average of 22.0 months ($SD=24.7$) prior to enrollment. Most men were partnered (66.3%) and 55.4% of the sample had received a bachelor’s degree and 12.4% a graduate degree. Around a quarter of the sample reported a household income of at least \$75,000. The majority underwent surgical treatment (78.7%), while around 21.3% received radiation treatment. The average number of medical comorbidities was 2.6 ($SD=1.3$). The most common comorbid conditions were diabetes without end-organ damage (16.5%) and myocardial infarction (4.4%). Table 1 provides a detailed description of sociodemographic and medical characteristics.

Descriptive statistics and variable correlations

Table 2 displays the descriptive statistics and correlations of the key study variables. Participants reported a mean familism score of 4.23 ($SD=0.55$), which is consistent with

Table 2 Correlations, Means, Standard Deviations, and Ranges of Primary Study Variables ($N=202$)

Variable	2	3	4	5	6	7	8	M (SD)	Observed Range (Scale Range)
1. Familism	0.17*	0.003	0.01	0.07	0.09	0.04	-0.04	4.23 (0.55)	2.60–5 (0–5)
2. Family Cohesion	–	0.01	0.11	0.21**	0.14	0.14*	0.18*	7.09 (1.61)	0–8 (0–8)
3. Urinary Functioning (Incontinence)		–	0.50**	0.33**	0.30**	0.10	0.12	71.52 (28.69)	0–100 (0–100)
4. Urinary Functioning (Irritative/Obstructive)			–	0.22**	0.41**	0.22**	0.24**	88.55 (15.77)	25–100 (0–100)
5. Sexual Functioning				–	0.30**	0.20**	0.26**	30.08 (26.38)	0–100 (0–100)
6. Physical Well-being					–	0.40**	0.47**	24.66 (3.72)	8–28 (0–28)
7. Emotional Well-being						–	0.53**	19.55 (3.69)	8–24 (0–28)
8. Functional Well-being							–	19.49 (4.76)	8–28 (0–28)

* $p < .05$; ** $p < .01$

Note. Means, standard deviations, ranges, and bivariate correlations presented were calculated before applying any variable transformation.

findings from other Hispanic samples ($M=4.22$; Losada et al., 2008; $M=4.44$; Sabogal et al., 1987). On average, participants indicated a high level of family cohesion ($M=7.09$, $SD=1.61$). Regarding PC-specific symptoms, the sample reported moderate difficulties in urinary incontinence ($M=71.52$, $SD=28.69$) and significant challenges in sexual functioning ($M=30.08$, $SD=26.38$). Overall, the participants demonstrated high urinary functioning in the irritative/obstructive domain ($M=88.55$, $SD=15.77$). Additionally, the average physical well-being score of 24.66 ($SD=3.72$) in our sample was greater than the mean scores of 21.0 ($SD=6.0$) reported by an adult cancer patient sample and 22.7 ($SD=5.4$) reported by a general U.S. adult sample (Pearman et al., 2014). Participants also reported average scores for emotional well-being ($M=19.55$, $SD=3.69$) and functional well-being ($M=19.49$, $SD=4.76$) that were comparable to those observed in adult cancer and general adult samples (Pearman et al., 2014).

Bivariate correlations revealed significant associations among the variables examined. Greater familism was positively correlated with increased family cohesion ($r=.17$, $p=.02$). Similarly, stronger family cohesion was associated with better sexual functioning ($r=.21$, $p<.01$), as well as higher levels of emotional well-being ($r=.14$, $p=.04$) and functional well-being ($r=.18$, $p=.01$). Additionally, higher urinary functioning in the incontinence domain was positively related to improved urinary functioning in the irritative/obstructive domain ($r=.50$, $p<.001$), enhanced sexual functioning ($r=.33$, $p<.001$), and greater physical well-being ($r=.30$, $p<.001$). Also, higher urinary functioning in the irritative/obstructive domain was associated with better sexual functioning ($r=.22$, $p<.01$), and increased levels of physical ($r=.41$, $p<.001$), emotional ($r=.22$, $p<.01$), and functional well-being ($r=.24$, $p<.001$). Moreover, higher sexual functioning was correlated with greater physical ($r=.30$, $p<.001$), emotional ($r=.20$, $p<.01$), and functional well-being ($r=.26$, $p<.001$). Further analysis showed that higher physical well-being was positively associated with

increased emotional well-being ($r=.40$, $p<.001$) and functional well-being ($r=.47$, $p<.001$). Lastly, higher levels of emotional well-being were significantly correlated with greater functional well-being ($r=.53$, $p<.001$).

Analysis of covariates

Sociodemographic and medical characteristics were assessed as possible covariates in the study models. Potential covariates were tested using bivariate correlations and one-way analysis of variance. Associations were deemed significant at the $p<.10$ level. Results indicated that better urinary functioning in the incontinence ($r=.15$) and urinary irritative/obstructive domains ($r=.15$), as well as sexual functioning ($r=.22$) was related to greater time since treatment ended ($p's<0.05$). Additionally, increased severity of comorbid conditions was related to worse functional well-being ($r=-.18$, $p=.01$). Greater neighborhood deprivation was associated with worse urinary functioning in the incontinence domain ($r=-.17$, $p=.02$). Similarly, increased fatigue was related to lower physical ($r=-.60$), emotional ($r=-.40$), functional well-being ($r=-.53$), and worse functioning in the urinary irritative/obstructive ($r=-.23$) and sexual domains ($r=-.23$; $p's<0.001$).

One-way analyses of variance revealed that men who completed graduate school endorsed better urinary functioning in the incontinence domain than those who completed vocational school ($F=2.99$, $p=.06$). Household income also had a significant impact on functional well-being, with men earning less than \$15,000 reporting worse outcomes compared to those earning \$35,000 - \$74,000 and \$100,000 or more ($F=3.63$, $p=.002$). Marital status emerged as another important factor, with married or partnered men endorsing greater functional well-being ($F=10.94$, $p=.001$).

Table 3 Six Hierarchical Regression Models of Familism as Predictor of General and Disease-specific HRQoL

Model (Outcome)	β	$R^2\Delta$	F for Δ	p value
Model 1 (Urinary Functioning – Incontinence)	0.01	<0.01	0.03	0.87
Model 2 (Urinary Functioning – Irritative/Obstructive)	0.001	<0.01	<0.01	0.99
Model 3 (Sexual Functioning)	0.10	0.01	1.68	0.20
Model 4 (Physical Well-being)	0.05	<0.01	0.66	0.42
Model 5 (Emotional Well-being)	0.32	<0.01	0.41	0.52
Model 6 (Functional Well-being)	-0.03	<0.01	0.41	0.53

Note. $R^2\Delta$ reflects the change in R^2 when familism was added as the last step in each model. Covariates: models 1 and 2 (ADI, time since treatment ended, comorbidities, age, education); model 3 (ADI, marital status, comorbidities, age); model 4 (ADI, fatigue, education); model 5 (education, income, treatment type, time since treatment ended); model 6 (fatigue, comorbidities, income, age, marital status)

Familism and HRQoL

The relationship between familism and general and disease-specific HRQoL was tested using separate hierarchical regression models that adjusted for relevant covariates. In each model, results demonstrated that the relationships between familism and both general and disease-specific HRQoL were not significant (Table 3).

Tests of moderation

Urinary functioning (incontinence). The interaction of familism and family cohesion was significantly associated with greater urinary functioning ($B = 54.05, SE = 24.72, p = .03, 95\% CI [5.27, 102.83]$). The Johnson-Neyman

technique revealed that the significant effect of familism on urinary functioning occurred at -46.27 on the family cohesion scale ($B = -2456.48, SE = 1244.81, p < .05$), which is equivalent to a score of 0.29 before mean centering and squaring the variable. Specifically, greater familism was related to lower urinary functioning when levels of family cohesion were low (Fig. 1).

Urinary functioning (irritative/obstructive). The interaction between familism and family cohesion demonstrated a significant association with greater urinary functioning ($B = 42.96, SE = 16.83, p = .01, 95\% CI [9.76, 76.16]$). Further examination using the Johnson-Neyman technique revealed that the effect of familism on urinary functioning reached significance at a family cohesion score of -20.07 ($B = -917.22, SE = 464.81, p < .05$), corresponding to a raw score of 2.61 before mean centering and squaring the variable. In particular, higher familism was found to be associated with lower urinary functioning, specifically when levels of family cohesion were low (Fig. 2).

Sexual functioning. Contrary to our hypothesis, family cohesion did not moderate the relationship between familism and sexual functioning ($B = 7.27, SE = 16.46, p = .66$).

Physical well-being. The interaction between familism and family cohesion was approaching significance as associated with physical well-being ($B = 0.04, SE = 0.02, p = .06, 95\% CI [-0.002, 0.08]$).

Emotional well-being. The interaction between familism and family cohesion demonstrated a significant association with emotional well-being ($B = 0.06, SE = 0.03, p = .02, 95\% CI [0.01, 0.11]$). The Johnson-Neyman technique showed that the effect of familism on emotional well-being attained significance at a family cohesion score of -41.80 (B

Fig. 1 Johnson-Neyman Plot: Urinary Functioning (Incontinence)

Johnson-Neyman Plot: Urinary Functioning (Incontinence)

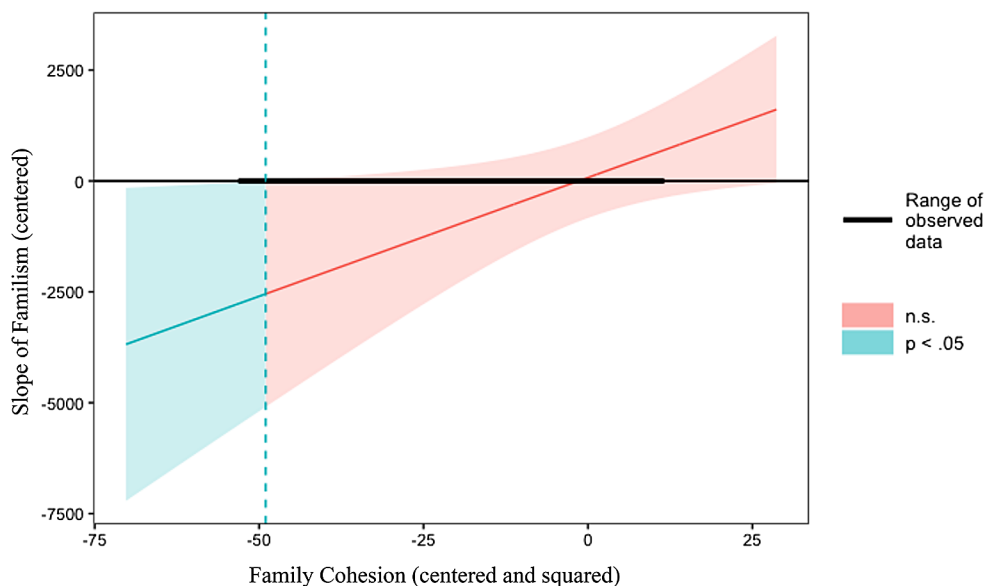


Fig. 2 Johnson-Neyman Plot: Urinary Functioning (Irritative/Obstructive)

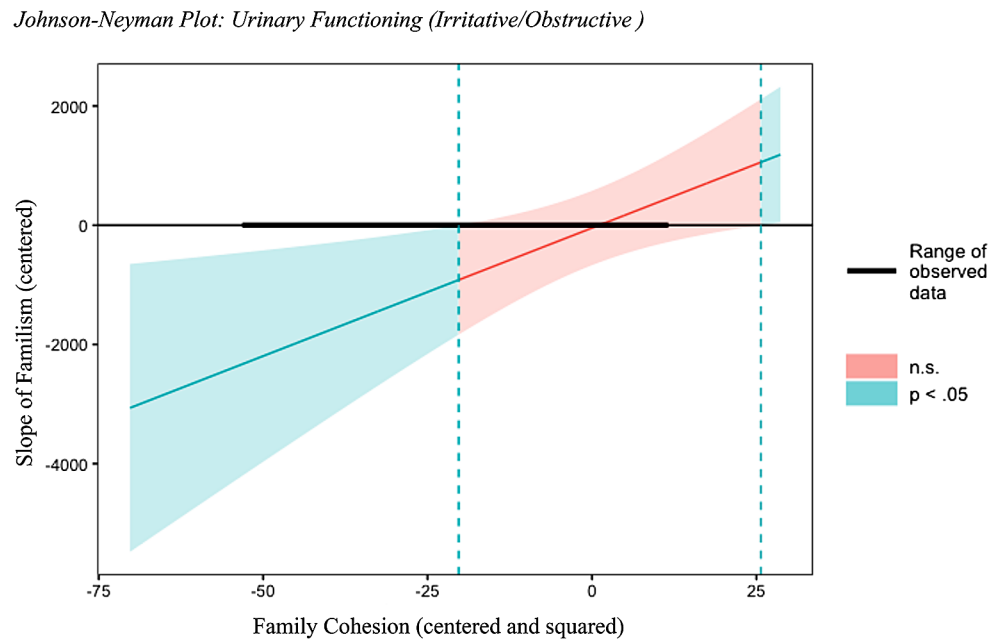
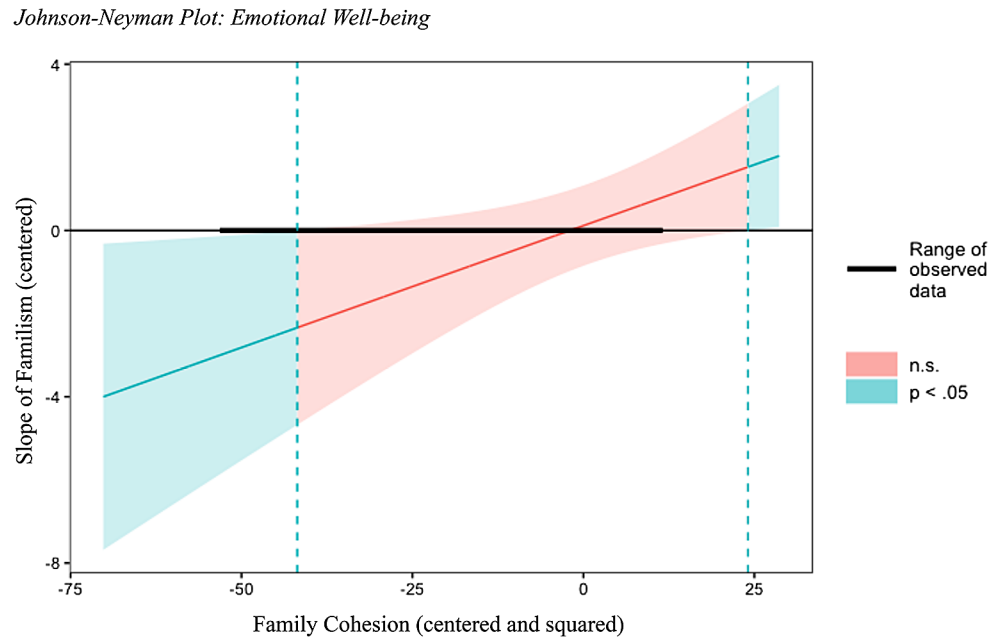


Fig. 3 Johnson-Neyman Plot: Emotional Well-being



$= -2.33, SE = 1.18, p < .05$), corresponding to a raw score of 0.62 before mean centering and squaring the variable. Specifically, when levels of family cohesion were low, higher familism was associated with lower emotional well-being (Fig. 3).

Functional well-being. The relationship between familism and functional well-being did not show significant variation based on levels of family cohesion ($B = 0.03, SE = 0.03, p = .13$).

Discussion

Consistent with previous longitudinal studies measuring PC treatment side effects (Davis et al., 2014; Selli et al., 2014), our present sample, on average, reported substantial difficulties with sexual dysfunction and incontinence at 22 months posttreatment. We used a sociocultural framework (Yanez et al., 2016) to examine the relationship between familism and HRQoL, as well as to explore potential variations in this relationship across different levels of family cohesion. Contrary to expectations, familism did not demonstrate a significant association with general and disease-specific HRQoL

on its own. One plausible explanation for this lack of significant findings is that our study utilized familial obligation as the sole indicator of familism, omitting the inclusion of the family support factor, which may hold greater relevance for HRQoL outcomes. Previous research has demonstrated the positive effects of perceived social support on the cognitive processing of the cancer experience and its influence on adaptive coping strategies (Roberts et al., 2006; Zhou et al., 2010a, b). It is possible that the exclusion of family support in our study limited the ability to capture the full impact of familism on HRQoL among PC patients. Future research should consider incorporating comprehensive measures of familism that encompass various dimensions (family support, familial obligation, family as referents) to gain a more comprehensive understanding of its associations with HRQoL outcomes in this population.

Our study examined whether the relationship between familism and HRQoL varies by level of family cohesion. It is important to note that having a familistic attitude does not necessarily imply the presence of a cohesive family, as evidenced by the small but significant correlation coefficient of 0.17 between familism and family cohesion in our study. Individuals may maintain strong familistic attitudes, despite experiencing low levels of family cohesion due to interpersonal conflicts (Hernández et al., 2010). In support of our hypotheses, greater familism was associated with poorer urinary functioning (more incontinence and irritative/obstructive symptoms) and lower emotional well-being, particularly when family cohesion was exceedingly low. The observed changes in both urinary functioning domains were not only statistically significant but also clinically meaningful (Skolarus et al., 2015). Our findings align with prior research, indicating that an incongruence between familism and family environment (e.g., family conflict or failure to meet family obligations) is associated with heightened distress and worse HRQoL among Hispanics (Fuller-Iglesias & Antonucci, 2016; Gelman, 2014; Nicasio et al., 2019). Notably, this study is the first to demonstrate the effects of such an incongruence in a sample of cancer patients. Although the underlying mechanisms were not examined, a sense of disconnection and limited closeness among family members could potentially contribute to increased distress, subsequently exacerbating urinary functioning and emotional well-being.

Family cohesion plays a significant role in influencing HRQoL outcomes among Hispanic PC patients. Extensive research has demonstrated that patients with family alliances marked by cohesiveness, open communication, shared decision making, and absence of conflict have better psychological adjustment to cancer (Edwards & Clarke, 2004; Fobair & Zabora, 1995; Kissane et al., 1994; Spiegel et al., 1983; Tan et al., 2018). Consequently, these factors

have been related to reduced chemotherapy-related symptoms, such as fatigue and nausea (Friedman et al., 1994; Kim & Morrow, 2007), and decreased symptom frequency and bother following hematopoietic stem cell transplantation (Yang et al., 2022). Cohesive family environments also facilitate the development of *positive psychosocial profiles* characterized by perceived support, self-esteem, feelings of personal control, and certain personality traits and individual differences (Forster & Stoller, 1992; Smith, 1992; Uchino, 2009). These profiles, in turn, contribute to better HRQoL through proactive coping strategies (Aspinwall & Taylor, 1997) and adaptive health behaviors (Aldwin et al., 2006). In addition to family cohesion, it is important to consider other contextual factors that interact with familism, including structural support, gender role socialization, and socioeconomic status (Calzada et al., 2012; Mendez-Luck et al., 2016; Stein et al., 2014; Toyokawa & Toyokawa, 2019; Zeiders et al., 2016). Consequently, future studies should investigate the interactions between familism and these contextual factors and their impact on HRQoL to develop more effective psychosocial interventions for PC patients.

The absence of a significant positive association between familism and HRQoL at high levels of family cohesion raises important considerations. The Johnson-Neyman plots (Figs. 2 and 3) revealed a region of significance at high levels of family cohesion, although these values fell outside the range of observed data. The positive association between familism and HRQoL may indeed exist but is likely limited to situations of extremely high family cohesion, which were not adequately represented in our sample. The square transformation of family cohesion could have altered the distribution of the variable and potentially affected the relationship with familism and HRQoL. Additionally, our study may not have had sufficient statistical power to detect this association. Future research with larger and more diverse samples should aim to explore this relationship further and elucidate the nuanced effects of familism and family cohesion on HRQoL.

Limitations

The present study had certain limitations that should be considered when interpreting the results. First, the sample consisted of Hispanic Spanish-speaking men with localized to locally advanced PC who were recruited from large academic medical settings and completed surgical or radiation treatment. Therefore, conclusions may not be generalizable to other ethnic groups or individuals with different disease stages or treatment modalities. Additionally, the present study employed a cross-sectional design, which limits the ability to draw causal inferences from the findings. The verbal administration of each measure introduces

the possibility of social-desirability bias, potentially leading to an overestimation of reported levels of family cohesion and HRQoL domains, such as physical well-being. Also, results should be interpreted cautiously due to the presence of multiple comparisons, which elevates the risk of type I error (Ranganathan et al., 2016). It is important to note that the study did not include a measure of structural familism, resulting in an absence of information regarding the proximity and availability of the family network. In addition, the study only used the familial obligation factor as an indicator of familism, as the family support and family as referents factors from Sabogal's Familism scale (Sabogal et al., 1987) were not administered. As a result, the study findings do not capture other dimensions of familism, such as consulting close relatives in major decisions or perceiving the family unit as a source of assistance and support. Another limitation of this study is the absence of a measurement for acculturation, given that familism, specifically the familial obligation factor, tends to decrease with higher levels of acculturation (Sabogal et al., 1987). Although acculturation was not measured in our study, it is noteworthy that participants reported high levels of familism despite having lived in the United States for an average of 32 years. This highlights the complexity of Hispanic cultural dynamics and suggests that familial values and obligations may persist even after prolonged exposure to a different cultural context.

Clinical implications

Cognitive behavioral stress management (CBSM), a group intervention based on cognitive behavioral therapy and stress-management training, has demonstrated its effectiveness in improving HRQoL and reducing symptom burden (i.e., sexual & urinary dysfunction) among men with PC (Penedo et al., 2004, 2020, 2006b). Recognizing the importance of incorporating cultural values, a culturally adapted version of CBSM (C-CBSM) for PC survivors was developed by Penedo and colleagues, specifically tailored to address Hispanic values and enhance treatment outcomes (Penedo et al., 2018). Given the significance of family dynamics and support systems in Hispanic populations, the C-CBSM intervention should pay particular attention to family-related factors. Patients with strong interdependence with nuclear or extended families may heavily rely on their family networks for support, while those with limited or conflicted family networks may face challenges in accessing sufficient support. By targeting individuals who hold familistic attitudes but experience low family cohesion, the C-CBSM intervention can address the specific psychosocial needs of this subgroup and help them navigate the challenges they face in accessing and maintaining a supportive network. The intervention can incorporate strategies aimed

at strengthening social support networks and expanding available support beyond the immediate family for patients with limited family. This may involve providing resources and guidance for patients to engage with alternative social networks, fostering connections and a sense of belonging outside the family unit. Simultaneously, for patients with cohesive families, the intervention can encourage engagement in self-care practices to maintain and further enhance the strong family support they already possess. To achieve these goals, specific techniques and components were included in the C-CBSM intervention (Penedo et al., 2018). Assertiveness training can help patients effectively communicate their needs within the family and beyond. Communication and coping skills training can promote adaptive interactions, effective problem-solving, and conflict resolution within family relationships. Additionally, encouraging adaptive emotional expression of positive and negative emotions can foster open and supportive communication among family members. Considering the interplay between familism and family cohesion in C-CBSM allows for a more comprehensive and culturally sensitive approach. By acknowledging the unique influence of family dynamics and support systems within Hispanic populations, the intervention can effectively leverage the strengths of familial networks to enhance psychosocial well-being, improve treatment outcomes, and optimize HRQoL.

Conclusion

The findings of this study highlight the significance of considering contextual factors, such as family cohesion, in understanding the relationship between familism and HRQoL. Familism and family cohesion together may predict clinically meaningful differences in urinary functioning and emotional well-being during the posttreatment phase. Results also highlight the need for culturally sensitive psychosocial interventions that consider the unique values and dynamics of Hispanic families. These interventions should aim to enhance family cohesion and leverage the positive impact of familistic attitudes on HRQoL outcomes.

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Declarations

Competing Interests M.H. Antoni and F.J. Penedo are consultants for Blue Note Therapeutics. P.B. Pedreira, S.E. Fleszar-Pavlović, E.A. Walsh, B. Noriega Esquivas, P.I. Moreno, D. Perdomo, and A. Heller declare they have no financial or non-financial interests.

Ethics approval Approval was obtained from the ethics committee of the University of Miami and Northwestern University. The procedures used in this study adhere to the tenets of the 1964 Declaration of Helsinki.

Consent to participate Informed consent was obtained from all participants included in the study.

Transparency statements This study was pre-registered at ClinicalTrials.gov on November 17, 2017 (NCT03344757). The analysis plan for this study was not formally pre-registered, and de-identified data from the study are not publicly archived. However, the de-identified data can be requested by emailing the corresponding author, in accordance with the University of Miami IRB standards. The analytic code used for the analyses presented in this study is not publicly available but may be obtained by contacting the corresponding author. Additionally, the materials used to conduct the study are not publicly available.

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