



Social support, social constraint, and psychological adjustment in patients with colorectal cancer

Nirvi B. Ajmera¹ · Brian D. Doss¹ · Youngmee Kim¹

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Abstract

Cancer patients' social networks, particularly their spouses or romantic partners, can promote or undermine their psychological adjustment. This study examined the relative associations of partner social support and social constraint with patients' psychological adjustment and further tested gender's moderating role in these associations. Participants were 124 patients newly diagnosed with colorectal cancer (*M* age = 56.6 years, 34% female), who completed questionnaires on perceived spousal social support and social constraint, depressive symptoms, and life satisfaction. Findings revealed that greater social constraint was significantly associated with lower life satisfaction regardless of gender; however, greater social constraint was only associated with greater depressive symptoms in male patients. No significant associations or interactions with social support were found. Findings highlight the importance for patients—especially male patients—with cancer to feel able to disclose cancer-related thoughts and feelings to their partners and call for more consistent operationalization and measurement when studying patients' social functioning.

Keywords Cancer · Psychological adjustment · Social support · Social constraint · Romantic partner

Introduction

As all-site cancer survival rates continue to improve (American Cancer Society, 2024), the psychological adjustment of patients with cancer has gained increasing attention (De Ridder, Geenan, Kuijer et al., 2008). Patients with cancer experience depressive symptoms at rates two to three times higher than the general population (Caruso et al., 2017; Hartung et al., 2017; Massie, 2004; Watts et al., 2014), with 8–24% of patients with cancer reporting depressive symptoms that meet clinical criteria (Krebber et al., 2014; Mitchell et al., 2011; Pilevarzadeh et al., 2019). Elevated depressive symptoms in patients with cancer include and have been associated with greater fatigue, sleep disturbance, weight loss, decreased energy, psychomotor changes (Barraera & Spiegel, 2014; Smith, 2015), suicidal ideation, poor quality of life (Chochinov, 2001; Smith, 2015), poor treatment adherence (DiMatteo & Haskard-Zolnieriek, 2011; Manning & Bettencourt, 2011; Theofilou & Panagiotaki,

2012), cancer recurrence (Wang et al., 2020), and greater mortality (Pinquart & Duberstein, 2010; Satin et al., 2009; Wang et al., 2020).

Patients with cancer have also reported levels of life satisfaction lower than (Vázquez et al., 2015) or on par with (Büssing et al., 2009; Ellis et al., 2019; Tsai et al., 2023) those of healthy populations. Higher levels of life satisfaction in patients with cancer have been associated with better quality of life, less severe physical symptoms, greater acceptance of illness (Polański, Chabowski, Świątoniowska-Lonc et al., 2020), and lower pain intensity (Dezutter et al., 2017). Overall, understanding the factors that are associated with patient depressive symptoms and life satisfaction are critical to best support patient wellbeing and physical health.

Patients' interpersonal context is one such factor and significantly correlates with depressive symptoms and life satisfaction. According to the social cognitive processing (SCP) model, individuals in patients' social networks may promote or disrupt patients' emotional and cognitive processing of potentially traumatic experiences such as cancer diagnosis and treatment (Lepore, 2001; Sippel, Pietrzak, Charney et al., 2015). Social support, defined in this study as patients' perceptions of support received from individuals in their social network (Haber et al., 2007; Luszczynska

✉ Nirvi B. Ajmera
nirvi.ajmera@miami.edu

¹ Department of Psychology, University of Miami, Miami, FL, USA

et al., 2013), promotes such emotional and cognitive processing. For example, individuals from patients' support networks may provide emotional comfort and offer new perspectives that allow patients to process, habituate to, and reappraise their cancer-related experiences (Belsher et al., 2012; Lepore, 2001). They also provide patients opportunities to openly communicate their physical and emotional unmet needs and can consequently provide support that reduces said unmet needs (Haber et al., 2007; Luszczynska et al., 2013; Martino, et al., 2019). Indeed, higher perceived social support is robustly associated with lower depressive symptoms (Carpenter, Fowler, Mawell et al., 2010; Fong et al., 2017; Gonzalez-Saenz de Tejada et al., 2017; Hsieh et al., 2020; Hu et al., 2018; Karnell et al., 2007; Mehnert et al., 2010; Thompson, Pérez, Kreuter, Margenthaler et al., 2017) and greater life satisfaction (Dunn et al., 2013; Faraci & Bottaro, 2022; Hamdan-Mansour et al., 2015; Li, Lyu, Wang, Yin, Zhang, & Li, 2024; Stephens et al., 2010) among patients with various types of cancer.

On the other hand, patients may perceive social conditions that lead them to modify or restrict their disclosure of cancer-related thoughts, feelings, or concerns—a social context known as social constraint (Lepore, 2001; Wong et al., 2018). Social constraint intentionally or unintentionally reduces or disrupts opportunities for patients to emotionally and cognitively process their cancer-related experiences (Lepore, 2001). For example, patients may perceive that their social partner is avoiding discussion of cancer-related thoughts, minimizing or dismissing the patient's cancer-related feelings, hiding their own cancer-related thoughts in an effort to protect the patient, or not seeming to understand the patient's situation (Lepore & Ituarte, 1999). Among patients with various types of cancer, higher social constraint has been associated with greater depressive symptoms (Adams et al., 2015; Chambers et al., 2015; Cordova et al., 2001; Darabos & Hoyt, 2017; Hyland et al., 2019; Rivera Rivera & Burris, 2020), lower overall psychological well-being (Cordova et al., 2001; Manne et al., 1997; Pasiapanodya et al., 2012; Rivera Rivera & Burris, 2020), and lower health-related quality of life (Cui, Wang, & Wang, 2021).

While theoretical distinctions between social support and social constraint have not been fully delineated, social support and social constraint have been conceptualized as positively and negatively valenced components of social functioning that may independently covary and co-occur in the same interaction or relationship (Rivera Rivera & Burris, 2020; Rivera Rivera, Badour, & Burris, 2021). For example, a patient may perceive high levels of both social support and social constraint in instances when their social partner is focused on “staying positive”—they might provide significant tangible support while simultaneously insisting that the patient not worry or think about their cancer. When

considering how these two constructs might then be associated with constructs such as depressive symptoms and life satisfaction, psychometric models posit that constructs with similar underlying valence will be more strongly associated with each other than will constructs with different underlying valences (Chida & Steptoe, 2008; Cordova et al., 2007; Ingersoll-Dayton et al., 1997). This suggests that positive aspects of one's social environment (e.g., social support) would be most strongly associated with positively valenced outcomes (e.g., life satisfaction), while negative aspects (e.g., social constraint) would correlate most strongly with negatively valenced outcomes (e.g., depressive symptoms). Empirical studies simultaneously examining both social support and social constraint in the same model (and thus controlling for each other's effects) have indeed found that social support is a stronger predictor of indicators of positive well-being and adjustment, such as benefit finding (Dunn et al., 2011) and post-traumatic growth (Nenova et al., 2013). In contrast, social constraint is consistently the strongest or only predictor of indicators of maladaptive adjustment, such as post-traumatic stress (Swartzman et al., 2017; Widows et al., 2000), overall negative mental health symptoms (Shim et al., 2006; Wingard et al., 2010), role limitations due to emotional problems (Figueiredo et al., 2004), distress (Mosher et al., 2012), negative affect (Boinon et al., 2012), and depressive symptoms (Boinon et al., 2012; Schmidt & Andrykowski, 2004).

In addition to valence, two additional factors may also impact differences in associations between social support and social constraint and psychological adjustment. First, previous studies examining both social support and social constraint in the same model have inconsistently specified the source of support and constraint. Studies have specified for patients to consider support from their social network at large (Boinon et al., 2012; Figueiredo et al., 2004; Schmidt & Andrykowski, 2004; Shim et al., 2006; Wingard et al., 2010), their family at large (Swartzman et al., 2017), either a spouse, friend, or relative (Dunn et al., 2011), their most important source of support (Widows et al., 2000), or their spouse or romantic partner (Mosher et al., 2012; Nenova et al., 2013). Evidence has demonstrated that examining support from undistinguished sources yields negligible or inconsistent results (Luszczynska et al., 2013), and additional evidence has indicated that romantic partners in particular have a significant impact on patients' cancer experiences that may be unique from that of other individuals in patients' support networks (Mosher et al., 2012; Nenova et al., 2013). For various reasons, married or partnered patients tend to have better cancer diagnosis-, treatment-, and mortality-related outcomes (Ibrahimi & Pinherio, 2017; Wang et al., 2011; Zhang, Yang, Qiu, & Zhou, 2022) compared with single or widowed patients and many patients cite their spouse as their most valuable source of support (Pfaendler et al.,

2015; Ruiz-Rodríguez et al., 2022). Similarly, perceiving social constraint from significant others has been found to be particularly distressing (Manne & Glassman, 2000), particularly for male patients (Zakowski et al., 2003). This study therefore focused specifically on support and constraint from patients' spouses or romantic partners given the high frequency of social contact couples have.

Second, the degree to which patients benefit or suffer from social interactions may also depend on their gender given gender norms surrounding support-seeking and emotional disclosure (Ettridge et al., 2018; Fish et al., 2015). For example, female patients with various types of cancer, compared to male patients, tend to perceive greater levels of social constraint and avoidance (Lyons et al., 2022; Pedersen et al., 2011) and lower levels of social support (Pedersen et al., 2011) from their partners. However, male patients with prostate cancer, compared to female patients with gynecological cancers, reported significantly greater distress and intrusive thoughts in the face of perceived social constraint from their spouse—despite reporting comparable levels of social constraint with female patients (Zakowski et al., 2003). Similarly, in a nationally representative sample, men exhibited significant longitudinal declines in health-related quality of life in response to longitudinal declines in social support from their support network at large, whereas this was not the case for women (Hajek et al., 2016). Limited evidence therefore supports a potential gender moderating role in associations between psychological adjustment and different types of social factors such that, in the face of social contexts characterized by lower levels of social support and/or higher levels of social constraint, male patients' psychological adjustment may be more negatively impacted compared to female patients.

This current study compares the extent to which social support and social constraint are associated with indicators of psychological adjustment and examines the putative moderating role of gender in such associations. This study utilized a sample with a single cancer type that is considered to be “gender neutral” to control for cancer-specific variability that may be introduced when examining more than one type of cancer, particularly to avoid comparing effects across “gender-specific” such as breast, gynecological, and prostate cancer. It was hypothesized that: (1) after controlling for social constraint, higher levels of social support would be associated with higher levels of life satisfaction, (2) after controlling for social support, higher levels of social constraint would be associated with higher levels of depressive symptoms, and (3) lower levels of social support and higher levels of social constraint would be more strongly associated with depressive symptoms in male patients compared with female patients. Gender differences in associations between life satisfaction and social support/social constraint were exploratory given the limited literature in this area.

Methods

Participants

Participants were 124 patients who were newly diagnosed with colorectal cancer. Eligibility criteria for patients included: (a) 18 years or older, (b) Diagnosed with stage I to IV colon or rectal cancer within 10 months prior to the enrollment, (c) Be able to read and speak English or Spanish at the 5th grade level, and (d) Have a romantic partner or spouse (hereafter, spouse) involved in care and daily activities. Exclusion criteria included (a) Active but untreated substance dependence, psychosis, dementia, sleeping disorders, phobias pertaining to medical treatment procedures, or suicidal ideation, (b) Unable to see or hear, (c) Poor physical functioning (defined as Eastern Cooperative Oncology Group scores ≥ 3 or Karnofsky Performance Status scores < 50 ; Oken et al., 1982; Karnofsky, 1949), (d) Poor cognitive functioning (Mini Mental State Examination < 24 ; Folstein et al., 1983), or (e) Under end-of-life care (< 6 months life expectancy). Patients were primarily middle-aged, heterosexual males who had an annual household income of more than \$40,000 and more than a college degree. Patients were primarily Hispanic, which broadly represented the ethnic makeup of the recruiting area. Patients were enrolled in the study approximately 6 months post-diagnosis and mainly diagnosed at advanced stages. One patient identified as homosexual in the sample.

Procedures

The current study is a secondary analysis of the first time-point of a larger longitudinal study on the quality of life of patients with colorectal cancer and their spouse or romantic partner caregivers (R01NR016838). The study was conducted in compliance with the Institutional Review Boards of University of Miami, Sylvester Comprehensive Cancer Center Protocol Review Committee, and the Jackson Health System Institutional Review Board. Potentially-eligible patients were identified by medical records from participating oncology clinics. Patients were recruited in person or over the phone from ten clinics operated by Sylvester Comprehensive Cancer Center. Of the available pool of eligible patients, a total of 158 patient-caregiver dyads (57.66%) enrolled in the parent study that required both patients and their spouses/partners to be enrolled. Of those, 9 patients did not provide any data. An additional 25 patients were not given the measure of social constraint, which was added later, leaving a total of 124 patients in the current analysis. Eligible patients provided written

informed consent prior to collecting study data. Patients completed self-report questionnaires, which included demographic questions and measures of perceived social support, perceived social constraint, depressive symptoms, and life satisfaction. Patients received \$100 upon completion of all study measures.

Measures

Perceived social support

The extent to which patients perceived various supportive behaviors from their spouse over the past month was measured by the 6-item positive support subscale of the Sources of Social Support Scale (SSSS; Carver, 2006) on a 5-point scale (1 = Not at all, 5 = A lot). Sample items include “How much does he/she give you reassurance, encouragement, and emotional support (affection), concerning your cancer?”, “How much does he/she give you advice or information about your cancer?”, and “How much does he/she give you assistance with things related to your cancer?”. Responses to individual items were averaged, with higher scores indicating greater perceived social support from their spouse. The six items had good internal consistency in the present study ($\alpha = 0.90$).

Perceived social constraint

The extent to which patients perceived their social interactions with their spouse or partner to be unsupportive, dismissive, critical, or marked by misunderstanding over the past month was measured using the 15-item Social Constraints scale (Lepore & Ituarte, 1999) on a 4-point scale (1 = Never, 4 = Often). Sample items include “Did your spouse/partner act uncomfortable when you talked about your illness?”, “Did your spouse/partner tell you not to worry so much about your health?”, and “Did your spouse/partner seem to be hiding his/her feelings?”. Items were averaged, with higher scores indicating greater perceived social constraint from their spouse or partner. The 15 items had good internal consistency in the present study ($\alpha = 0.85$).

Depressive symptoms

The degree to which patients experienced various depressive symptoms over the past month was measured by the 20-item Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) on a 4-point scale (0 = Rarely or none of the time; 3 = Most or all of the time). Items were summed after reversal coding when necessary to indicate higher scores for greater levels of depressive symptomatology (Radloff, 1977). The 20 items had good internal consistency in the present study ($\alpha = 0.88$).

Life satisfaction

The extent to which patients were satisfied with their lives was measured by the 5-item Satisfaction with Life Scale (SWLS; Diener et al., 1985), on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). Items were summed with higher scores indicating greater satisfaction with life. The 5 items had good internal consistency in the present study ($\alpha = 0.88$).

Covariates

Covariates known to be significantly associated with depressive symptoms and life satisfaction of patients with cancer, including age (Fagundes et al., 2014; Gana et al., 2013; Hinz et al., 2019; McAdams et al., 2012; Wen et al., 2019), income (Budría & Ferrer-I-Carbonell, 2019; Proto & Rustichini, 2015; Walker et al., 2021), and advanced cancer stage (Dunn et al., 2013; Hinz et al., 2019; Wen et al., 2019) were included in the analyses as covariates.

Statistical analysis

Means, standard deviations, and frequencies of study variables were computed and reported in Table 1. Zero-order correlations among study variables were computed and reported in Table 2. Pearson's product moment correlation coefficients were reported for continuous and normally distributed variables. Spearman's rank correlation coefficients were reported for dichotomous and non-normally distributed variables. Hierarchical general linear modeling (GLM) was employed to examine the associations between social support and social constraint with psychological adjustment (i.e., depressive symptoms and life satisfaction) simultaneously. The covariates (i.e., age, income, and cancer stage) were included in the model first. Main study variables (i.e., social support, social constraint, and gender) were added to the model in the second step, followed by the two-way interaction terms between either social support or social constraint and gender in the third step. If interaction terms were significant, post-hoc tests were conducted to depict simple effects. Exploratory analyses examining the interaction effect between social support and social constraint, suggested by an anonymous reviewer, were also examined. All data analyses were conducted using SPSS Version 28.0 (IBM Corp., 2022).

Results

Sample characteristics

Table 1 displays sample characteristics for the total sample as well as separated by gender. On average, participants

Table 1 Sample Characteristics and Study Variables Descriptives

Variable	Total sample N=124		Male patients N=82		Female patients N=42		t (122) or χ^2	p
	Mean or Frequency	SD or % of total sample	Mean or Frequency	SD or % of total sample	Mean or Frequency	SD or % of total sample		
Age (years)	56.62	10.66	57.58	10.44	54.74	10.96	1.409	0.161
Ethnicity								
Hispanic	78	62.9%	55	44.4%	23	18.5%	$\chi^2(4,124)=6.308$	0.177
Non-Hispanic White	33	25.8%	20	16.1%	13	10.5%		
Non-Hispanic Black	7	6.5%	5	4.0%	2	1.6%		
Other	6	4.8%	2	1.6%	4	3.2%		
Income								
< \$10,000	11	8.9%	8	6.5%	3	2.4%	$\chi^2(5,124)=1.033$	0.960
\$10,000–\$39,999	21	16.8%	14	11.3%	7	5.6%		
\$40,000–\$69,999	25	20.2%	16	12.9%	9	7.3%		
\$70,000–\$120,000	25	20.1%	18	14.5%	7	5.6%		
> \$120,000	29	23.4%	18	14.5%	11	8.9%		
Prefer not to answer	13	10.5%	8	6.5%	5	4.0%		
Education								
Less than High School	15	12.1%	12	9.7%	3	2.4%	$\chi^2(6,124)=9.416$	0.152
High School Diploma/GED	10	8.1%	8	6.5%	2	1.6%		
Associates/Technical Degree	18	14.5%	7	5.6%	11	8.9%		
Some College	13	10.5%	10	8.1%	3	2.4%		
College Degree	31	25.0%	21	16.9%	10	8.1%		
Professional/Graduate Degree	36	29.0%	23	18.5%	13	10.5%		
Did not answer	1	0.8%	1	0.8%	0	0%		
Cancer stage								
Stage I	18	14.5%	12	9.7%	6	4.8%	$\chi^2(3,124)=6.179$	0.103
Stage II	17	13.7%	9	7.3%	8	6.5%		
Stage III	51	41.1%	30	24.2%	21	16.9%		
Stage IV	38	30.6%	31	25.0%	7	5.6%		
Time since diagnosis (months)	6.72	3.91	6.67	3.88	6.83	4.00	−0.221	0.826
Social support (1–5)	4.07	0.92	4.45	0.88	3.90	0.97	1.466	0.145
Social constraint (1–4)	1.50	0.45	1.44	0.40	1.61	0.52	−2.054	0.042
Depressive symptoms (0–60)	13.41	9.13	12.30	8.70	15.60	9.66	−1.919	0.057
Life satisfaction (5–35)	23.05	7.83	22.98	7.81	23.19	7.95	−0.144	0.886

N=124

reported higher levels of social support than patients in another sample with breast cancer ($t(252)=11.96$, $p<0.001$: Kinsinger et al., 2011). Participants also reported levels of social constraint that were slightly lower than those of patients with breast cancer ($t(167)=1.85$, $p=0.066$: Pasipadonya et al., 2012) but higher than those of patients with prostate cancer ($t(306)=2.39$, $p=0.018$: Agustsdottir et al., 2010). Participants reported moderate levels of depressive symptoms that were comparable to a sample of patients with breast cancer ($t(223)=1.48$, $p=0.14$: Giese-Davis et al., 2011) but higher compared with a sample of patients with colorectal cancer ($t(764)=2.03$, $p=0.04$: Calman et al., 2021) and a sample

of general older adults ($t(1,664)=-14.83$, $p<0.0001$: Andresen et al., 1994). Participants also reported lower life satisfaction compared to a sample of patients with primarily colorectal and breast cancer ($t(835)=6.89$, $p<0.001$: Lorenzo-Seva et al., 2019) and a nationally representative sample of adults ($t(1,533)=3.99$, $p<0.001$: Vazquez et al., 2015). Female participants reported significantly higher levels of perceived social constraint and marginally higher depressive symptoms, compared with male patients. Male and female participants in the current study reported comparable levels of social support and life satisfaction. Table 2 displays zero-order correlation coefficients among study variables.

Table 2 Zero-order correlation coefficients among study variables

	Age	Income	Advanced stage	Gender	Social support	Social constraint	Depressive symptoms
Income	−0.297**	–					
Advanced stage	−0.040	−0.008	–				
Gender	−0.127	0.033	−0.217*	–			
Social support	−0.060	0.075	0.081	−0.132	–		
Social constraint	−0.139	0.049	0.024	0.183*	−0.397**	–	
Depressive symptoms	−0.123	−0.056	0.067	0.171	−0.163	0.432**	–
Life satisfaction	0.022	0.096	−0.181*	0.013	0.168	−0.318**	−0.594**

$N = 124$, * $p < 0.05$, ** $p < 0.01$

Pearson's product moment correlation coefficients are reported for continuous and normally distributed variables. Spearman's rank correlation coefficients are reported for dichotomous and nonnormally distributed variables. Income: $\geq \$40,000 = 1$; $< \$40,000 = 0$; Advanced Stage: Cancer stages III and IV = 1; Cancer stages I and II = 0; Gender: Female = 1, Male = 0

Associations of social support, social constraint, depressive symptoms, and life satisfaction

As shown in Table 3, hierarchical general linear modeling revealed that covariates were not significantly associated with depressive symptoms or life satisfaction. Among main study variables, only higher levels of social constraint were associated with higher levels of depressive symptoms and lower levels of life satisfaction. Further, a significant interaction between gender and social constraint on depressive symptoms indicated that this association differed by gender. Subsequent analyses indicated that higher levels of social constraint were associated with higher levels of depressive symptoms for male patients ($b = 11.923$, $p < 0.001$) but not for female patients ($b = 3.860$, $p = 0.135$). Finally, the interactions between social constraint and social support were

insignificant when predicting depressive symptoms and life satisfaction (Table 3).

Discussion

The current study examined the extent to which social support and social constraint were associated with depressive symptoms and life satisfaction in patients who were recently diagnosed with colorectal cancer. Results revealed that greater social constraint was significantly associated with greater depressive symptoms, although further analyses revealed that this was the case only for male patients. Greater social constraint was also significantly associated with lower life satisfaction regardless of gender. Social support was not significantly associated with either outcome.

Table 3 Hierarchical general linear modeling predicting depressive symptoms and life satisfaction

	Depressive symptoms			Life satisfaction		
	$b(SE)$	t	p	$b(SE)$	t	p
Covariates	$R^2 = 0.035$			$R^2 = 0.029$		
Age	−0.119 (0.081)	−1.463	0.146	0.027 (0.070)	0.389	0.698
Income	2.466 (1.977)	1.247	0.215	−2.388 (1.700)	−1.405	0.163
Advanced cancer stage	−2.144 (1.868)	−1.148	0.253	2.316 (1.606)	1.442	0.152
Main effects	$\Delta R^2 = 0.188$			$\Delta R^2 = 0.108$		
Gender	−1.974 (1.616)	−1.221	0.224	−1.027 (1.459)	−0.704	0.483
Social support	0.118 (0.898)	0.132	0.895	0.433 (0.811)	0.535	0.594
Social constraint	8.320 (1.832)	4.541	< 0.001	−5.399 (1.654)	−3.264	0.001
Two-way interaction effects	$\Delta R^2 = 0.038$			$\Delta R^2 = 0.015$		
Gender * social support	0.443 (1.835)	0.242	0.809	1.210 (1.684)	0.718	0.474
Gender * social constraint	8.424 (3.637)	2.316	0.022	−2.780 (3.338)	−0.833	0.407
Two-way interaction effect	$\Delta R^2 = 0.000$			$\Delta R^2 = 0.000$		
Social support * social constraint	0.186 (1.810)	0.103	0.950	−0.103 (1.634)	−0.063	0.950

Income: $\geq \$40,000 = 1$; $< \$40,000 = 0$; Advanced Cancer Stage: Cancer stages III and IV = 1; Cancer stages I and II = 0; Gender: Female = 1, Male = 0

Gender interactions: social constraint and depressive symptoms

In the full sample, social constraint was associated with depressive symptoms as expected; however, subsequent analyses by gender revealed that this association only held for male patients. The fact that social constraint was not significantly associated with female patients' depressive symptoms was unexpected given that female patients in this sample reported significantly higher levels of social constraint compared with male patients, a gender difference that is in line with existing findings (Lyons et al., 2022; Pedersen et al., 2011). Such findings would need to be replicated before drawing firm conclusions from a null effect. However, there are several potential explanations for this pattern of findings given that patients were asked to evaluate perceived social support and social constraint specifically from their spouse and not from other individuals. First, in the face of coping with cancer, male patients are less likely than female patients to seek social support in general (Clarke et al., 2006; Henrich, 1999). Male patients are also more likely to have limited social networks and tend to rely primarily on their spouse for support (Clarke et al., 2006; Harrison et al., 1995; Pedersen et al., 2011; Salander & Hamberg, 2005), often forgoing individuals such as medical and mental health providers, family, and friends. Male patients' limited social networks—when combined with feeling unable to disclose their thoughts and feelings to their partner—may place male patients at exacerbated risk for depressive symptoms (Fish et al., 2015; Park & Kim, 2021; Zakowski et al., 2003). In addition, male patients may be influenced by gender norms that discourage them from first having negative emotional reactions, followed by discouragement of displaying and disclosing such emotions to others (Boise & Hearn, 2017). Male patients may be more likely to perceive socially constraining behaviors that reinforce male gender norms and therefore feel discouraged to disclose negative emotional reactions to others (Carbone et al., 2024; Darabos & Hoyt, 2017; Ettridge et al., 2018; McCaughan et al., 2011), perhaps out of embarrassment, shame, desire to not appear weak, or need for control and independence (Ettridge et al., 2018; Fish et al., 2015). Especially considering the high proportion of Hispanic patients in this sample, it is also possible that gender-coded constructs culturally relevant to this population such as machismo and caballerismo (Badger et al., 2019; Nuñez et al., 2016; Yanez et al., 2016) are particularly salient. Machismo and caballerismo together encompass positive and negative traits, beliefs, and values characteristic of masculinity such as bravery, dominance, aggression, reserving one's emotions, and emphasizing one's role as the provider of the family (Nuñez et al., 2016). Such culturally-sensitive constructs may further reinforce male patients' reluctance to disclose their thoughts and feelings.

Overall, in order to target social constraint for male patients, it may be helpful to both increase male patients' disclosure as well as decrease others' behaviors that are perceived as constraining. Male patients may benefit from psychoeducation and other interventions that acknowledge cultural and societal challenges associated with self-disclosure, motivate patients to find individuals in their support network or support groups with whom they feel able to share their thoughts and emotions, teach specific communication skills that may facilitate such disclosure (Zhou et al., 2023b), and engage and provide similar psychoeducation to male patients' support networks to encourage them to facilitate and accept such disclosure as well.

In contrast, female patients may feel freer to experience and share emotional reactions than male patients (Boise & Hearn, 2017). Female patients also tend to have larger social networks, meaning they have access to additional individuals with which to process their thoughts and feelings if they feel unable to do so with their spouse (Hann et al., 2002; Kroenke et al., 2006; Park & Kim, 2021). They can therefore still receive benefit from the cognitive and emotional processing posited to facilitate coping with cancer and alleviate depressive symptoms (Lepore, 2001), highlighting the importance of assessing levels of social support and social constraint as perceived from a multitude of individuals in patients' networks.

Critical role of social constraint for life satisfaction

Greater levels of social constraint were also significantly associated with lower levels of life satisfaction for both male and female patients. Although there has been limited research investigating the direct associations between social constraint and life satisfaction in cancer patients, findings are consistent with existing literature from the general population that evaluations of one's social relationships are closely associated with evaluations of one's life overall (Amati et al., 2018; Barger et al., 2009; Powdthavee, 2008). Having social relationships characterized by social constraint during a time of elevated stress, uncertainty, and need for support (Harrison et al., 2009; Sanson-Fisher et al., 2000) may be particularly salient when cancer patients evaluate their satisfaction with their life overall. In addition, findings should be interpreted with the caveat that this study specifically examined social constraint perceived from patients' spouses given the indirect links between social constraint, romantic relationship functioning, and life satisfaction. For example, self-disclosure, a key component of social constraint, is also a key ingredient for maintaining relationship intimacy and closeness (Laurenceau et al., 1998; Sprecher & Hendrick, 2004), especially in couples coping with a shared stressor such as cancer (Manne et al., 2004; Zhou et al., 2023b). Lower marital satisfaction, relationship wellbeing, and

marital adjustment in patients with cancer have robustly been associated with social constraint and self-disclosure (Manne et al., 2014; Pasipanodya et al., 2012; Porter et al., 2005; Soriano et al., 2021; Zhou et al., 2023b), as well as life satisfaction (Be et al., 2013; Buhler, Krauss, & Orth, 2021; Heller et al., 2004). This suggests that processes that disrupt or weaken a couple's relationship (such as social constraint) may directly and indirectly lead to changes in life satisfaction. Findings support the growing development of communication-based couples-oriented interventions specifically targeting aspects of couples' communication and romantic relationship such as reciprocal self-disclosure, partner responsiveness, relationship engagement, and relationship-compromising behaviors (Badr, 2017; Zhou et al., 2023a). Such interventions have already previously demonstrated positive impacts on individual-level functioning and quality of life for patients and their spouses in addition to positive impacts on relationship functioning (Zhou et al., 2023a) and in conjunction with the current study's findings, warrant further development and wide-spread implementation to best support patients and their spouses.

Social support and psychological adjustment

Lastly, social support was not significantly associated with depressive symptoms, consistent with the valence-specific hypothesis. However, contrary to our hypothesis, social support was also not found to be associated with life satisfaction. Although findings must be replicated to draw firmer conclusions, this finding is notable given social support's seemingly robust protective role in supporting patient adjustment. Findings suggest that negative social interactions such as those characterized by social constraint may be more strongly associated with aspects of patients' psychological adjustment regardless of valence. This pattern of findings is in line with Baumeister et al. (2001) observation that "bad is stronger than good" and suggests that greater focus be paid in psycho-oncology settings to assessing not just the presence or absence of social support, but also whether patients feel they have individuals in their support network with whom they can disclose and fully process their cancer-related feelings. However, there are several reasons to suspect that other types or aspects of social support may continue to play a role in patients' depressive symptoms and life satisfaction.

First, perceptions of received social support (assessed in this study) and perceived availability of social support are distinct and only mildly correlated methods of measuring social support (Haber et al., 2007; Helgeson, 1993; Melrose et al., 2015). Indeed, perceived availability of support has been more consistently associated with psychological adjustment than received support in healthy samples (Helgeson, 1993; Melrose et al., 2015; Uchino, 2009), although

evidence for this phenomenon has been more mixed in cancer populations (Luszczynska et al., 2013; Thompson et al., 2017; Schroevers et al., 2010). Further, given the high heterogeneity in available measures of social support (Rivera Rivera & Burris, 2020), this distinction between perceived availability and perceived receipt of support is not always fully delineated, further muddling existing findings.

Second, increasing attention has been paid towards whether a patient's need for support is matched with the support they actually receive, a mismatch of which has consistently been associated with poor outcomes (Drageset et al., 2012; Linden & Vodermaier, 2012; Maisel & Gable, 2009; Merluzzi et al., 2016; Rini et al., 2011; Schroevers et al., 2010). For example, a patient with unmet support needs might desire support but not be receiving it, while another patient may have low support needs but receive an extreme level of support or receive the wrong type of support, which may threaten their sense of independence and self-efficacy (Ruiz-Rodriguez et al., 2022). It is also possible that patients are reporting lower levels of received social support due to having a low need for support rather than because they have support needs that are not being met. Consideration of patients' nuanced support needs are therefore essential to consider when measuring social support, although there is a dearth of available measures assessing such support needs (Krumholz et al., 1998; Linden & Vodermaier, 2012).

Third, research has indicated that invisible social support, or support which is not perceived by the patient (Bolger et al., 2000)—and thus not accounted for by patients in their reports of received social support in the present study—may be more essential in dealing with a stressor that is outside of a patient's control. Receiving invisible support has been found to be positively associated with patient adjustment (Bolger & Amarel, 2007; Bolger et al., 2000; Maisel & Gable, 2009; Nurullah, 2012), proposed in part because being aware of the support they are receiving may take an emotional toll on some patients (Bolger et al., 2000; Howland & Simpson, 2010). Overall, the large variability in conceptualizations and corresponding measures of social support may be contributing to inconsistencies in the literature regarding social support's protective role in patient adjustment (Barrera, 1986; Rivera Rivera & Burris, 2020).

Fourth, cultural views and practices around social support and emotional disclosure have also been shown to differentiate findings (Nurullah, 2012; Wellisch, Kagawa-Singer, Reid, Lin, Nishikawa-Lee, & Wellisch, 1999), a consideration which may again be particularly salient given the high percentage of Hispanic patients in our sample (Gonzalez et al., 2005; Tyson et al., 2017). In addition to previously mentioned gender-coded constructs such as machismo and caballerismo, constructs relevant to Hispanic populations such as familism, or the cultural value that emphasizes supporting one's family (Pedreira et al., 2024; Yanez et al., 2016)

and acculturation status (Perez & Cruess, 2011; Stephens et al., 2010) may be especially relevant and have demonstrated mixed findings in regards to being helpful or harmful for mental health, such as when an individual may simultaneously feel guilty for receiving support from their family while also being more likely to perceive a higher availability of support (Perez & Cruess, 2011). More research is needed to understand how social support and social constraint may be differentially associated with depressive symptoms and life satisfaction based on culturally sensitive constructs.

Finally, it may be that social support from other individuals in their support network (other than their romantic partner) is more essential, or at least needs to be accounted for. It is possible that, although social constraint from patients' spouses is overshadowing the possible salutary properties of social support from their spouses, receiving social support from other individuals in their support network may be able to overcome the negative associations of spousal social constraint. Overall, a number of factors may help explain the lack of significant associations with social support. Findings highlight the need for more comprehensive, multidimensional, and commonly utilized measures of social support (Rivera Rivera & Burris, 2020). Relevant dimensions of interest may include capturing support perceived from multiple sources from the patient's social network, distinguishing perceived availability vs. perceptions of received support, and patient's needs for support vs. the support they are actually receiving. Such information may aid in adding further nuance to the role social support plays in patient adjustment. In addition, despite the field's strong focus on social support in past decades, findings support greater investigation of social constraint's role in impacting patients' individual-level and relationship-level functioning over and above what is able to be explained by social support.

Limitations and future directions

Findings should be interpreted in light of study limitations. First, this study was cross-sectional, precluding conclusions on the directionality and causality between study variables. For example, common experiences of individuals experiencing depressive symptoms include the tendency to have negative cognitions which are thought to be involved in both the development and maintenance of depression (Teasdale, 1983), being rigid in their beliefs and focusing less on evidence that contradicts said negative cognitions (Aguilera et al., 2019; Lau, et al., 2020), and experiencing less positive affect overall (Sharpley et al., 2013). Therefore, if a patient was already experiencing depressive symptoms prior to their diagnosis or is experiencing depressive symptoms as a result of their diagnosis or other cancer-related experiences, they may also be more likely to perceive their spouse as socially constraining despite objective evidence indicating otherwise.

Depressive symptoms can also lead to decreased engagement in behaviors that the patient previously found helpful and enjoyable, such as support seeking and disclosing their cancer-thoughts and feelings to their spouse, thereby exacerbating a tendency to perceive less support and greater social constraint from their spouse.

It could also be the case that findings change over time as the couple progresses through the cancer journey. Patients in this study were observed approximately six months following their diagnosis. Social support from family, friends, and health-care providers typically declines after a cancer patient's initial diagnosis (Arora et al., 2007; Salonen et al., 2013). However, limited evidence suggests that spousal social constraint also typically declines over time (Soriano et al., 2017) as couples become more adjusted to the cancer experience. Studies examining longitudinal trajectories of social support and social constraint over the course of the patient's cancer experience are essential to understanding directionality concerns and developing a better understanding of patients' needs and concerns as they transition into survivorship.

Third, the sample size and smaller representation of female patients compared to male patients in this study limited the examination of additional factors associated with markers of patient adjustment and corresponding gender differences. The sample was also restricted to a specific cancer type (i.e., colon and rectal cancers), which may limit generalizability to other cancer types. However, choosing a gender-neutral cancer such as colon and rectal cancers allows for a more controlled examination of gender differences compared to confounding factors that are introduced from examining more gender-specific cancers such as breast and prostate cancer. Our sample was also primarily Hispanic, primarily heterosexual, and typically of higher economic status and educational background, which may limit generalizability to patients from different social, ethnic, economic, and sexual backgrounds and identities. Lastly, given that participation in the study required patients to have a romantic spouse or partner who served as their primary caregiver and who was also willing to participate in the study with them, generalizability to patients who do not have a romantic spouse or partner and patients who might be in lower quality romantic relationships is limited.

Conclusion

This study provides additional evidence regarding the role that different aspects of patients' social functioning have in the association with patient psychological adjustment, particularly negative social functioning characterized by social constraint. Findings also contribute further evidence regarding the importance gender may play in such associations

and particularly, the importance of social functioning for male patients with cancer. Lastly, findings highlight the need for nuanced measurement of social functioning, different aspects of which may lead to different findings. Future studies and interventions may consider expanding to additional individuals in patients' support networks, using multi-faceted measures of social functioning, and examining additional moderators of the associations between social and psychological functioning such as cultural, cognitive, emotional, biological, and disease-related factors.

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Data, material, and code availability This study and its analysis plan was preregistered with an analysis plan (<https://doi.org/10.17605/OSF.IO/JU9DK>). Deidentified data and analytic code used to conduct this study are not publicly available but can be provided upon request. Materials used to conduct this study are not publicly available.

Declarations

Conflict of interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval This study was approved by the University of Miami Research Ethics Committee, Sylvester Comprehensive Cancer Center Protocol Review Committee, and the Jackson Health System Institutional Review Board (approval no. 20160736) on September 29, 2016.

Consent to participate All participants provided written informed consent prior to participating.

Consent for publication Not applicable.

Human and Animal rights I certify that this research complied with ethical standards, following the Helsinki Declaration (1975, revised in 2013) and relevant national regulations.

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