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Depression and Family Interaction among Low-Income, Predominantly Hispanic Cancer Patients: A Longitudinal Analysis[1]

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Abstract

Purpose—Among cancer patients, family interaction has been associated with depression. According to the stress generation theory, depression among cancer patients triggers stressful interpersonal events that contribute to poor family interactions and additional depression. This conflict may occur with a spouse/partner or other family member, including extended family. This study evaluated the longitudinal association between depression and marital and family conflict among low-income, predominantly Hispanic cancer patients.

Methods—Data were collected during a randomized controlled clinical trial of depression treatment among 472 low-income cancer patients with baseline depression scores of 10 or more on the Patient Health Questionnaire-9 and whose depression symptoms and negative family interactions were assessed at baseline and at 6, 12, 18, and 24 months. Because not every participant was in an intimate relationship, only 237 participants were included in the analysis of marital conflict. Mixed linear modeling with and without decomposition of between- and within-person variability was conducted to examine the longitudinal association between family interaction and depression.

Results—Overall, family conflict was significantly associated with changes in depression over time, and marital conflict was significantly associated with mean depression levels over 2 years. In addition, within-subject change in both marital and family conflict was significantly associated with within-patient deviation from average depression levels.

Conclusion—Findings provide evidence of an association between depression and negative family interaction among depressed cancer patients. Cancer patients with clinically significant depressive symptoms may benefit from clinical assessment and psychotherapy relevant to family interaction.

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Conflict of Interest: We do not have any a financial relationship with the organization that sponsored the research. We have full control of all primary data and agree to allow the journal to review their data if requested.

Keywords

depression; family interaction; marital conflict; family conflict; longitudinal study

Introduction

Social support from family, friends, and health professionals is vital to the health of cancer patients [1–3]. In particular, family members such as spouses, children, or relatives have a greater influence than alternate sources such as friends or acquaintances [1, 4]. For instance, cancer patients may lose contact with acquaintances or friends with weak ties once they share their cancer diagnosis and end up relying on family members [4]. Previous studies of cancer patients have found that family support may alleviate depression [5, 6] and reduce negative immune response [7], mortality [8], and tumor progression [3].

Despite their benefits, family relationships can be a source of psychological and health burdens for cancer patients [9–11]. One study examining newly diagnosed cancer patients discovered that negative interactions with a spouse had an effect similar to experiencing serious spousal illness [11]. The Women's Health Initiative found that 40% of women with breast cancer reported ongoing family caregiving responsibilities, with the size-of-kin-network interacting with mortality in a dose-response relationship [10]. Finally, changes in premorbid patterns of patient-family interaction and caregiving roles, particularly among female cancer patients, also contributed to distress among cancer patients [12–14]. Receiving social support that cancer patients do not need or would rather not receive has been associated with depression [15].These findings collectively highlighted the potential stressors caused by family for cancer patients and the subsequent negative outcomes, including depression.

However, evidence has suggested a reciprocal relationship between depression among cancer patients and negative family interactions [16, 17]. Studies using samples with different cancer sites, sampling methods, and depression measures have consistently reported higher prevalence rates of depression among cancer patients versus the general population; rates of clinical depression among cancer patients have ranged from 9% to 23% [18–20], exceeding the general population rate of 6.7% [21]. The course of clinical depression after a cancer diagnosis varies, with some individuals experiencing post-diagnosis depression for up to 2 years or recurrent depressive episodes [22, 23]. If depression remains untreated, cancer patients may express behaviors such as social inhibition, coldness, vindictiveness, and low self-sacrificing actions [24], which may lead to increased negative interactions with family members, lower marital satisfaction between couples [25], and reduced social support [16].

One explanatory model accounting for the cyclical relationship between depression and negative interactions is the stress generation theory [26–28]. This model posits that existing depression triggers negative interactions with others that subsequently strengthens and prolongs the initial depression in a negative-feedback loop [29]. Although this phenomenon has been extensively studied in the general population, few studies have evaluated hypotheses relevant to the stress generation theory among cancer patients. One anomalous study testing this theory investigated whether depressive symptoms preceded stressful events and whether those stressful events predicted depressive symptoms at 12 months among patients with breast cancer recruited after surgery but before adjuvant treatment [28]. Results indicated that stressful events mediated two depressive symptoms over a 1-year period, with mediation lasting up to 24 months post-baseline, supporting a potential mediating role of stressors with regard to prolonged or relapsed depression. However, a

review of the literature revealed no studies that directly examined the association between depression and negative family interactions, a knowledge gap the present study sought to address.

The present investigation examined the relationship between negative family interactions and depression among cancer patients over time. Negative interactions in both marital and overall family relationships were examined based on literature that distinguished those constructs as distinct [30]. Based on the findings from studies examining family relationships among cancer patients and the stress generation theory, we assessed the following: (1) associations between negative marital and family interactions and depression over time using variable mean scores and (2) changes in marital conflict and family conflict associated with concurrent changes in depression at the same time intervals when examining variation among individuals versus group means. To examine the two research questions, we conducted mixed linear modeling [31] and modeling of within-person changes during two years by decomposing variance, which allowed for the examination of the association between changes of time-varying variables among individuals [32].

Methods

Participants and Procedure

This secondary analysis used longitudinal data collected from 472 predominantly Hispanic, low-income cancer patients recruited from safety-net oncology clinics in Southern California [33]. The internal review board from the focal university approved this study. The original study was a randomized clinical trial comparing the effectiveness of a collaborative model of depression versus enhanced usual care [22]. The eligibility criteria and recruitment process have been described thoroughly elsewhere [33]. After completing informed consent, all patients were given depression education materials for both patients and family members, in either English or Spanish, and adapted for the literacy of the study population. Secondary analysis of data from clinical trials typically used participant responses from the control condition and excluded responses from the treatment condition to avoid any confounding effects from the intervention in the original study [28]. However, statistically controlling for between-group differences permitted us to analyze data from participants in both conditions. Total sample and its subsample were analyzed: (1) total participants (N = 472 at baseline) to examine the effect of family conflict and (2) married participants at baseline, as well as unmarried participants at baseline whose marital status changed during the study, reporting marital conflicts during 2 years (N = 237). Death and attrition rates were relatively high; participants primarily reported low socioeconomic status and strong relationships in kin networks with relatives abroad, primarily in Mexico or Central America. Participants' levels of negative marital and family interactions and depression were assessed at five time points during the 2-year study period: baseline and 6, 12, 18, and 24 months after baseline. Outcome interviews were conducted either in person or via telephone by bilingual staff who received extensive research training from the principal investigator and study managers. The interviews were conducted in English or Spanish [33].

With respect to the total sample, overall response rates were 67.4% (n = 318) at 6 months, 54.7% (n = 258) at 12 months, 57.6% (n = 272) at 18 months, and 44.5% (n = 210) at 24 months. With respect to the marital conflict sample, response rates were 72.6% (n = 172) at 6 months, 59.5% (n = 141) at 12 months, 65.4% (n = 155) at 18 months, and 52.7% (n = 125) at 24 months. Women and Hispanic patients were more likely to participate in follow-up surveys, and patients who had completed high school or higher were less likely to follow up. A detailed sample description can be found elsewhere [22].

Measures

Family interactions—The extent of negative family interactions was measured by two constructs: *marital conflict* and *family conflict*. Both forms of conflict were measured by one item that queried whether participants had experienced each stressor during the past 6 months. Participants who reported experiencing either stressor were asked to indicate the intensity of the stressor's effects using a 10-point scale. Because target constructs were measured with a single item, no reliability and validity data were available. Preliminary analyses found the family interaction variable to be negatively skewed, with 82.9% and 53.8% of the total sample indicating no stressful marital or family conflicts, respectively, during the study period. Therefore, we dichotomized each variable into (1) a group with *any* report of marital or family conflict and (2) a group without a report of marital or family conflict during the 2 years for mixed modeling with repeated statements that examined any different pattern of depression between the two groups. Two variables for marital and family conflicts, respectively, were created. For modeling of within-person variance by decomposition, the original continuous variable was analyzed.

Depression—Depressive symptomatology was measured via the Patient Health Questionnaire-9 (PHQ-9) [34], a 9-item measure assessing depression severity and clinical diagnostic information using a 4-point Likert scale (0 = *not at all* to 3 = *nearly every day*). Item scores were summed to derive a depression severity score, with scores exceeding 10 indicating a high likelihood of clinical depression [34]. The PHQ-9 has been validated with 3,000 patients recruited from primary care setting clinics and possesses good reliability and validity for the diagnosis of possible clinical depression [34].

Statistical Analysis

Descriptive statistics were calculated for the total sample and subsample of participants who were married at baseline or reported marital conflict during the study period. Time-varying variables of marital conflict, family conflict, and depression were examined longitudinally to determine whether the means patterns were similar among variables.

The fixed-effect models were fitted with longitudinal data from baseline to 24 months to evaluate the effects of dichotomized marital and family conflict comparing the two previously described groups (any report vs. no report during two years) on changes of depression over time. To find the best fit model, the means patterns were examined by comparing fit statistics and graphs indicating the their trajectories from models with different assumptions, including linear, quadratic, and an unstructured means pattern. Based on the evaluation, the unstructured means pattern was chosen. Error variance-covariance structures were examined with a deviance table, leading to the selection of an unstructured variance-covariance structure without random effects [31].

In addition, modeling of within-person changes during 2 years by variance decomposition was conducted to determine whether changes in negative interaction levels were associated with changes in depressive symptomology for each of the five assessment periods [32]. This method allowed us to study the correlation between the deviations in marital and family interactions from each participant's estimated mean value during the study period. First, we estimated individual means from the 2-year study period by averaging the five values for each variable. Next, these assessment point values were subtracted from the individual means to determine the magnitude of deviation. When deviation values for each assessment were analyzed with mixed linear modeling, estimated coefficients between the two deviations indicated the extent to which the deviations were associated over time. In other words, the relationship between within-person variations was examined, as well as between-person variation.

Mixed linear modeling analyses and modeling for within-person changes were conducted with PROC MIXED in SAS version 9.3 statistical software for Windows. These analyses were adjusted for gender, severe cancer status (i.e., Stage 3, 4, or recurrent cancer) at baseline, cancer treatment phase at baseline, language (English vs. Spanish), and study arm (intervention vs. enhanced usual care). In the analyses examining the association between family conflict and depression, marital status at baseline was added to the set of covariates.

Results

Table 1 shows the descriptive statistics for demographic variables, cancer-related confounders, and dichotomized variables measuring the extent of marital and family conflict. The majority of the study patients were female (84.5%) and reported Spanish as their primary language (79.9%). At baseline, only 36.4% of the total sample was married, and 27.4% of the sample for marital conflict reported they were not married at baseline. With respect to cancer-related factors, most of the patients at baseline were either receiving active cancer treatment or follow-up oncologist care, and 28.7% were diagnosed with Stage 3, 4, or recurrent cancer. Finally, 27.1% of patients reported their marital conflict was perceived as stressful. The percentage reporting stressful marital conflict increased to 54% for the sample of participants married. For the family conflict analysis, 46.2% of the sample reported stressful family conflict, as did 49.4% of the sample for marital conflict analysis.

Table 2 presents the means for negative family interaction and depression. All examined variables evidenced similar trajectories over time, with mean values decreasing from baseline to 12 months before increasing between 12 and 24 months.

Results from mixed-model analyses examining the associations between marital or family conflicts and depression for the total sample are summarized in Table 3. Because these mixed models assumed an unstructured mean pattern, only *F* values for predictors were available. In the marital conflict-depression model, both time and marital conflict significantly predicted depression, but the interaction term between time and marital conflict was not significant, indicating that the history of marital conflict during the two years was not associated with changes in depression over time ($p > .05$). In the family conflict-depression model, time, family conflict, and the interaction between time and family conflict significantly predicted the trajectory of depression over time ($p < .05$).

Figures 1 and 2 show the estimated average depression during 2 years for the total sample and for patients with or without marital conflict (Figure 1) and family conflict (Figure 2) after controlling for confounders. Patients reporting marital conflict had significantly higher levels of depression over 2 years than those not reporting marital conflict ($p < .05$). Figure 1 shows significant gaps between groups at each assessment point. Patients reporting family conflict had significantly different patterns of depression compared with those without a history of family conflict during the two years ($p < .05$). The gap between depression levels of the two groups increased from baseline to 18 months. Finally, on average, patients reporting either marital or family conflict exceeded the 10-point diagnostic cutoff score for major depression, whereas those who did not report a negative interaction did not.

Finally, analyses that decomposed depression variance into between- and within-person variability (Table 4) were conducted to determine whether immediate changes in reported negative interactions were associated with changes in depressive symptomology at the same time point. Analyses revealed that not only were the variances in reported marital ($p < .001$) and family ($p < .001$) conflicts significantly associated with depression, but also the deviation from each patient's average value of negative interaction was significantly associated with depression ($p < .001$). In addition, these associations were all positive,

showing that increased negative interactions perceived as stressful were associated with immediate increased depression.

Discussion

The current study was among the first to find evidence for a pattern of marital and family conflict in relation to depression over time among cancer patients. Descriptive analyses revealed similar trajectories of means for negative interactions with partners, negative interactions with family members, and depressive symptomology during the 2-year period. That is, when the average levels of negative marital and family interactions increased or decreased across a 6- month span, average depressive symptomology followed a similar trajectory. In addition, depression levels of patients reporting a history of family conflict decreased less from baseline during the 2-year period compared with patients without reported history of family conflict. These findings endorse the notion that cancer patients with depression who also report family conflicts are likely to experience increased depressive symptoms [4]. The findings also align with qualitative reports indicating that positive family support is critical for reducing psychological distress associated with overburdened family interactions [14].

Finding a significant association between family conflict and the trajectory of depression is consistent with previous research supporting this association [9, 14, 35] and is possibly reflective of the stress generation theory [26, 27]. In other words, increased stressful negative interactions among family members might be a proximal risk factor for severity of depression among cancer patients. However, marital conflict was not associated with a trajectory of depression over time, contradicting previous findings that negative marital interaction is a risk factor for depression among patients with various cancer types [9, 11].

This divergence from previous research has a number of plausible explanations. First, null findings of the association between reported marital conflict and change of depression over two years might be attributable to the cultural characteristics of the study sample, i.e., Hispanic cancer patients with low linguistic acculturation (79.9%) and female gender (84.5%). As previous studies concerning Mexican American couples have shown, less-acculturated couples use more conflict avoidance and less direct expression during martial arguments [36]; thus, marital discontentment may have been less likely to manifest into reported marital conflict in our low-acculturated sample. In addition, Latina cancer patients with low socioeconomic status (SES) commonly experience difficulties articulating their needs and discomfort to their partners [14]. As a result, depression severity may not be significantly associated with marital conflict. However, it is unclear whether this finding is affected by gender roles that are distinct within the family structure for this cultural group [36, 37]. Second, studies on marital relationship among patients with chronic illness suggest equivocal effects of marital conflict on psychological health [38, 39, 40]. For instance, a spouse' attempts to promote health practices (e.g. regular exercise) or to reduce health-compromising behaviors (e.g., tobacco use) usually involve hostile actions such as criticism [39]. Since this social control can be either an outcome reflecting positive intimacy between couples or an antecedent of a stressful marital relationship, the direction of correlation with emotional distress is equivocal [38, 40]. Therefore, our null finding in the association between marital conflict and change of depressive symptoms might be related to the ambivalent impact of possible social control on depression.

Finally, findings from modeling within-person changes indicate that cancer patients reported more depression when they perceived their negative interactions with spouses and family members as stressful. This specific statistical method evaluated whether changes from an individual's average level of negative interaction was associated with concurrent changes in

depression during the same period. Given that group level analysis mainly reported mean group differences depending on the levels of each predictor, an approach that introduces additional error into regression modeling, the results from the model with decomposition provided more confidence regarding the influence of negative interactions on depression [32].

Limitations

A primary limitation of this study was the reduced sample size over time, as well as the inclusion of participants who received intensive problem-solving therapy [33], which featured problem-solving and coping skills and guidance regarding how to access community resources. In addition, in terms of conceptualizing *family interaction*, examining stressful conflict with spouses and family members incompletely qualifies the nature of family interaction. For instance, a couple in which one partner is diagnosed with depression demonstrates significantly worse functioning across multiple domains of intimate and family interactions (e.g., familiar roles, communication, or conflict over childrearing) [25]. Therefore, to fully understand the interaction between depressive symptomology and family interaction, further investigations of family interaction, such as cohesion or spouse and family members' depression levels are recommended. However, given the limited time and resources for clinicians implementing an intake session, where information about family interaction can be collected, simple way for data collection that was used in this study is also important for clinical setting. In addition, marital and family conflict were each assessed with one item rather than with more complex measures of stress exposure due to practical challenges related to assessing patients on multiple occasions. Although two constructs were measured with a single item, this method has been used to study the quality of family relationships [41] and the occurrence of stressful interpersonal conflicts, including a recent longitudinal study [42].

Preliminary analyses showed that the correlations between negative family and marital interactions ranged from 0.01 to 0.28, indicating these two constructs were distinct. However, future researchers may consider collecting more detailed data regarding the extent of psychosocial service needs experienced by cancer patients [43] during and after treatment by using advanced measures such as the Bedford College Life Events and Difficulties Schedule [44]. Finally, we were unable to fully test the reciprocal nature of the stress generation theory (i.e., negative interactions potentially influencing earlier depressive symptomology) [28] because we could not analyze any negative interactions as a dependent variable regressed by depression. Negative interaction was not deemed an appropriate dependent variable because more than half of the sample did not report negative interactions, and the variables were negatively skewed. In addition, mixed linear modeling is not intended to address issues of causality embedded in the stress generation theory. Instead, our study used mixed linear modeling to demonstrate associations between the occurrence of interpersonal stressors and changes in depressive symptoms in terms of between- and within-subject associations, a necessary precursor to confirming the stress generation theory.

Conclusions

This study examined the trajectories of depressive symptomology among disadvantaged, low-income minority cancer patients with clinical depression and stratified those trajectories according to the level of negative interactions with partners and family members who assumed significant social support roles [1, 4, 13]. Results of our study suggest that negative marital and family interactions contribute to ongoing depression among cancer patients, possibly directly by triggering recurrent depressive symptoms in previously depressed patients [29] and indirectly by reducing social support from caregivers, which protects

against depression [16, 17]. In closing, current data underscoring the deleterious effects of negative family interactions on the psychological well-being of cancer patients highlight the critical need to monitor family conflicts and integrate family-focused psychosocial treatments into cancer care [43] to enhance social support, improve depression and immune response outcomes, and prevent increased mortality among cancer patients.

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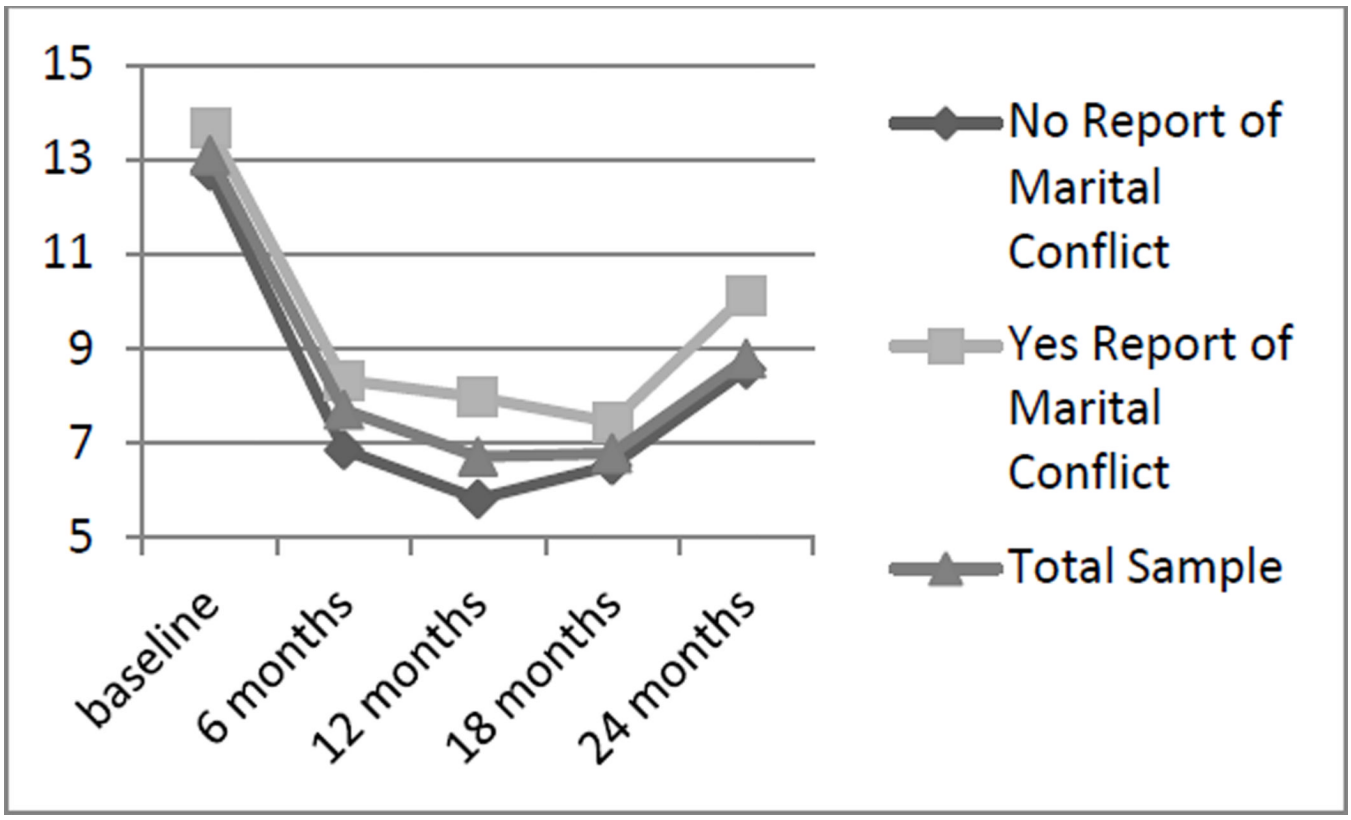

Fig. 1.
Trajectories of Groups Based on Marital Conflict

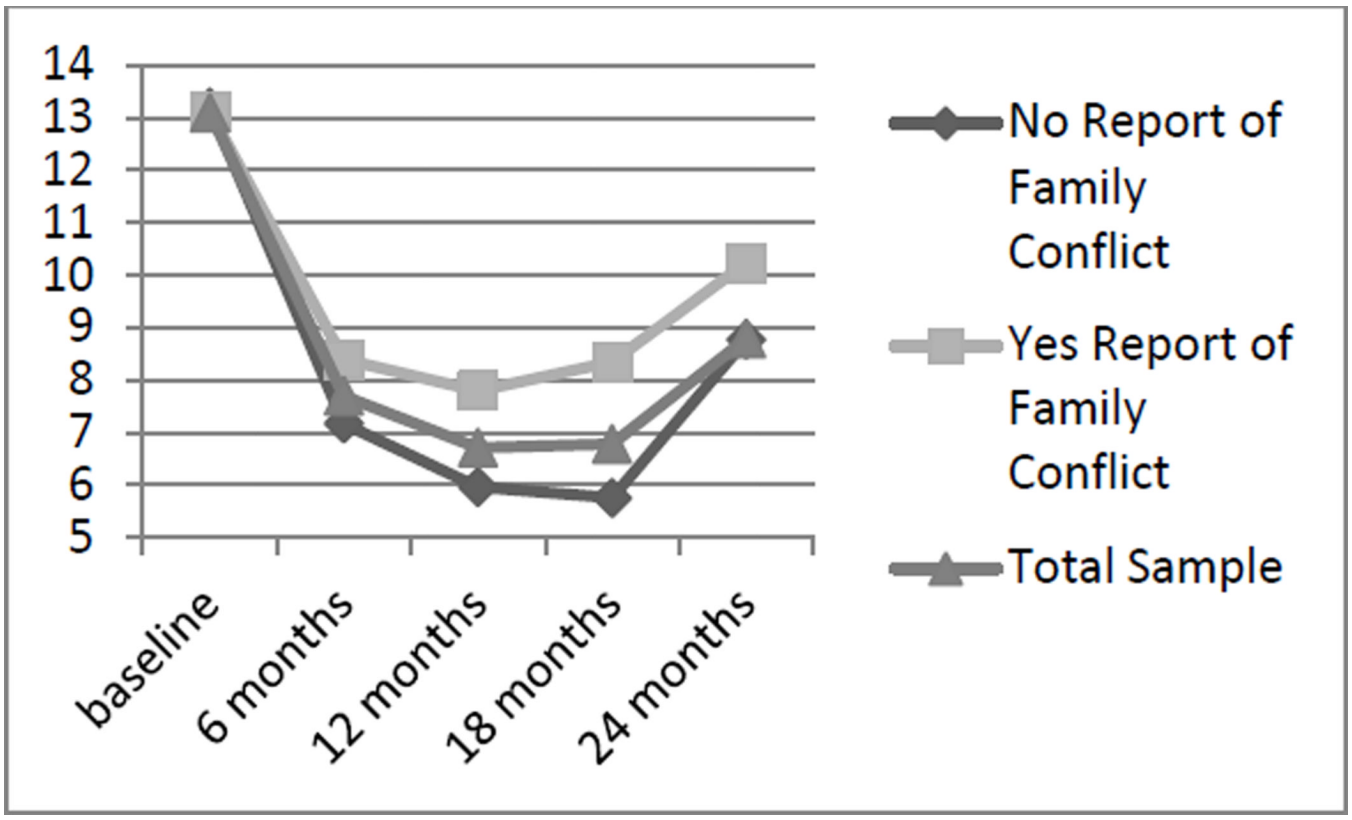

Fig. 2.
Trajectories of Groups Based on Family Conflict

Table 1

Descriptive statistics of samples

Variable	Family conflict (*n* = 472)	Marital conflict [a] (*n* = 237)
	%	%
Gender (female)	84.5	81.9
Spanish-speaking (no English)	79.9	81.3
Marital status		
Married	36.4	72.6
Divorce, separated or, widowed	33.5	11.8
Never married	30.1	15.6
Cancer treatment phase		
Prior to treatment	11.0	11.4
In treatment	40.9	39.7
Follow-up care	48.1	48.9
Intervention group	51.3	51.5
Severe cancer status at enrollment	28.8	28.7
Report of marital conflict during study	27.1	54.0
Report of family conflict during study	46.2	49.4

[a] Means of data from a sample of participants married at baseline or who reported marital conflict during the study period (n = 237).

Table 2

Patterns of means at baseline and 6, 12, 18, and 24 months

Variable	Possible range	Baseline	6 months	12 months	18 months	24 months
Marital conflict[a]	0–10	2.60	1.76	1.43	1.43	2.55
Negative family interaction[b]	0–10	1.59	1.59	1.09	.96	2.06
Depression (PHQ-9) [b c]	0–27	13.09	7.70	6.71	6.78	8.79

Note.

[a]Means of data from a sample of participants married at baseline or who reported marital conflict during the study period (n = 237).

[b]Sample size: n=472.

[C]PHQ-9 = Patient Health Questionnaire-9.

Table 3

Effect of reported marital or family conflict on trajectory of depression over 2 years

Model	Variable	*F*	*p*
Marital conflict (ref = no marital conflict)	Time	79.01	< .001
	Marital conflict	5.58	< .05
	Time × marital conflict	0.60	>.05
Family conflict (ref = no family conflict)	Time	151.61	< .001
	Family conflict	11.60	< .001
	Time × family conflict	5.04	< .001

Note. Mixed-effects linear modeling analyses were adjusted for gender, severe cancer status at baseline, cancer treatment stage, non-English-speaking participants, and condition group in the original clinical trial. In the family conflict model, marital status at baseline was also added to the covariates.

Table 4

Decomposition of time-varying family interaction-related variables into between- and within-person variability of depression

Model	Variables	Estimate (*SE*)	*t*	*p*
Marital conflict	Intercept	10.39 (.91)	11.46	< .001
	Within-person variability	.35 (.06)	5.60	< .001
	Between-person variability	.38 (.11)	3.59	< .001
Family conflict	Intercept	10.98 (.70)	15.68	< .001
	Within-person variability	.25 (.05)	4.88	< .001
	Between-person variability	.34 (.09)	3.74	< .001

Note. Mixed-effects linear modeling analyses were adjusted for gender, severe cancer status at baseline, cancer treatment stage, non-English-speaking participants, and condition group in the original clinical trial. In the family conflict model, marital status at baseline was also added to the covariates.