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AN OBSERVATIONAL STUDY OF SOCIAL CONTROL, MOOD, AND SELF-EFFICACY IN COUPLES DURING TREATMENT FOR HEAD AND NECK CANCER

HODA BADR, PHD¹, CHI YEUNG, MA¹, MEGAN A. LEWIS, PHD², KATHRIN MILBURY, PHD³, and WILLIAM H. REDD, PHD¹

¹Department of Oncological Sciences, Icahn School of Medicine at Mount Sinai, New York, NY

²Patient and Family Engagement Research Program, Center for Communication Science, RTI International, Research Triangle Park, NC

³Department of General Oncology, The University of Texas M D Anderson Cancer Center, Houston, TX

Abstract

OBJECTIVE—Head and neck cancer (HNC) patients experience debilitating side effects, including abnormally reduced salivation and difficulty swallowing. Intensive self-care protocols are prescribed to control side effects and minimize discomfort, but non-adherence rates are high. Although spouses are in a prime position to encourage adherence, studies have yet to examine how spouse social control (i.e., attempts to influence patient behavior to support adherence) affects HNC patient mood and self-efficacy for engaging in these self-care routines.

METHODS—One-hundred twenty-five HNC couples where the patient (86% male) was undergoing radiotherapy were recorded in the laboratory as they discussed a cancer-related issue that the patient identified as being a topic of concern.

RESULTS—Sixty-eight couples discussed side-effects and spouses engaged in social control in 61 of these discussions. Although oral complications and pain were frequently identified by patients as being topics of concern, dental/oral care and pain management were some of the least likely self-care behaviors to be targeted by spouses, who focused primarily on encouraging patients to maintain their weight and hydration. Although spouses engaged in an almost equal number of positive and negative control attempts, only positive control was significantly ($p < .05$) associated with patient positive mood and self-efficacy.

CONCLUSION—HNC couples may benefit from programs that emphasize the regular practice of self-care routines to control oral side effects, pain, and nutrition/hydration problems. Likewise, programs that encourage spouses to maximize their use of positive social control may also boost patients' mood during treatment and empower them to engage in recommended self-care behaviors.

Correspondence to: Hoda Badr, Ph.D., Department of Oncological Sciences, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place – Box 1130, New York, NY 10029, USA. hoda.badr@mssm.edu, Telephone: (212) 824-7642.

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Keywords

social control; head and neck cancer; couples; mood; self-efficacy; self-management

BACKGROUND

The term head and neck cancer (HNC) is used to describe a wide range of malignant tumors originating in the upper aerodigestive tract, including the larynx, pharynx, nasopharynx, and oral cavity. HNCs account for approximately 560,000 new cases annually worldwide and 3% of all cancer cases in the United States (Jemal et al., 2011; Siegel, Ma, Zhaohui, & Jemal, 2014). Despite the fact that HNC is not as highly prevalent as some other cancers (e.g., breast, lung, prostate), the disease and its treatment have a disproportionate impact on patient quality of life. Individuals who are diagnosed with HNC often undergo intensive radiotherapy treatments (5 days a week for 6 to 7 weeks), either alone or combined with other treatment modalities (Network, 2013). Given the intensity of radiation required to successfully treat HNC tumors and the sensitive location that is targeted, patients experience significant physical (i.e., pain, abnormally reduced salivation, mucositis) and functional (i.e., difficulty swallowing, loss of taste, tube feeding) challenges that make eating and drinking an unpleasant ordeal (Bjordal et al., 2000). As a consequence, they experience rapid weight loss, dehydration, and malnutrition during treatment as well as social and emotional problems that can persist long after treatment ends (Epstein, Robertson, Emerton, Phillips, & Stevenson-Moore, 2001; Jansma et al., 1992; Silverman Jr, 1999).

To control side effects and reduce long-term functional problems, intensive home-based self-care protocols are often prescribed at the start of radiotherapy. For example, patients are instructed to use salt-soda rinses 8–10 times per day and drink copious amounts of water throughout the day (even though they have difficulty swallowing), alter their diet significantly to include high-protein and soft/liquid foods, practice multiple daily repetitions of different types of swallowing exercises, and engage in intensive oral care routines including the application of daily fluoride gels (Jansma, et al., 1992; Nguyen, Smith, & Sallah, 2007). Unfortunately, rates of patient non-adherence with these self-care protocols are extremely high – as many as 72% of patients are non-adherent with recommendations regarding oral care and 87% are non-adherent with swallowing exercises (Epstein, Meij, Emerton, Le, & Stevenson-Moore, 1995; Shinn et al., 2013). This is problematic because poorly managed side effects are associated with treatment interruptions, social and emotional problems, and more complicated and costly rehabilitation (Cox et al., 1992; Nitenberg & Raynard, 2000; Trotti et al., 2003). To date, no studies have directly examined factors associated with non-adherence in this population; however, possible factors include the complicated, time consuming, and aversive nature of the protocols themselves, and patient factors such as mood (DiMatteo, Lepper, & Croghan, 2000), lack of knowledge, and lack of self-efficacy for implementing these complex self-care protocols at home (McGuire, 2003).

The Couple Relationship As A Resource

For cancer patients who are in an intimate relationship, their partner is often their primary caregiver and research has consistently demonstrated that marital status confers a substantial health benefit among cancer patients (Goodwin, Hunt, Key, & Samet, 1987; Lai et al., 1999; Langenbach, Schmidt, Neumann, & Zirngibl, 2003). A recent analysis of Surveillance, Epidemiology, and End Results (SEER) data for the 10 most common cancers found that even after adjusting for demographics, stage, and treatment type, married patients were 17% less likely to present with metastatic disease, 53% more likely to opt for definitive treatment, and 20% less likely to die of cancer than their unmarried counterparts (Aizer et al., 2013). Head and neck cancer (HNC) patients benefited the most - being married reduced their risk of dying from cancer by 33% (hazard ratio [HR] = .67). This risk reduction is greater than the published overall survival benefit for chemotherapy for HNC (HR = .87; Blanchard et al., 2011). Other studies corroborate these findings and have shown that married HNC patients have significantly better performance status during treatment than unmarried patients (Konski et al., 2006). Given all this, it may be useful to develop a clearer understanding of the interpersonal mechanisms that link being married/in a partnered relationship to better health outcomes in HNC.

Social Control and HNC

Although much research has examined the benefits of close relationships on health, little is known about the ways that intimate partners can influence patient adherence to self-care protocols during cancer treatment. One interpersonal mechanism that may be of relevance in cancer given its known association with adherence in chronic illness populations (August, Rook, Parris Stephens, & Franks, 2011; Stephens, Rook, Franks, Khan, & Iida, 2010) is social control. Social control is a term that comes from the social/health psychology literature that refers to attempts to influence behavior to support adherence (Lewis, Gladstone, Schmal, & Darbes, 2006). Among married individuals, the spouse is the most frequently named source of social control and those who are the targets of social control engage in more health enhancing and fewer health compromising behaviors (Lewis & Rook, 1999; Tucker, 2002; Tucker & Anders, 2001). Social control may be particularly important to patients who must adhere to complex self-care tasks. For example, encouraging self-care at the start of radiotherapy when patients are seeking to establish self-care routines is an area in which spouses can exert great influence and bolster patient self-efficacy for managing symptoms at home.

Understanding Relations between Spouse Social Control, Mood, and Self-Efficacy

Research has shown that spouse social control can take positive and negative forms. Examples of spouse positive social control are using logic to persuade a partner to engage in a recommended behavior, positive reinforcement, and offering to make behavioral changes together. Examples of spouse negative social control are making a partner feel guilty or scared that they are not engaging in a desired behavior, criticism, and nagging (Butterfield & Lewis, 2002). Research in a sample of young married couples found that individuals whose spouses used positive social control made more attempts to engage in healthy behavior change, but that this was not the case for those whose spouses used negative social control

(Tucker & Anders, 2001). Although this suggests that the valence of the control attempt may affect how it is received, and, in turn, how it affects behavior, studies have yet to explore this in the context of a life-threatening illness such as HNC.

Researchers have suggested that social control may have dual effects by discouraging maladaptive behaviors and eliciting interpersonal/psychological stress (Hughes & Gove, 1981). Although some studies support this dual-effects model (Lewis & Rook, 1999), others suggest that it may not adequately capture the range of responses to health-related social control. For example, spouse social control does not always elicit distress and may even be welcomed if it is perceived as being motivated by concern (Holmila, 1991). Given this, it may be useful to develop a better understanding of the conditions under which social control has beneficial effects as well as the conditions under which it is likely to backfire by examining associations between spouse social control, mood, and self-efficacy in HNC.

The Present Study

This observational study examined health-related social control in couples in which the patient was undergoing radiotherapy for HNC by analyzing couple discussions about cancer-related side-effects in the lab. One of the benefits of conducting an observational study as opposed to a traditional descriptive study involving self-report questionnaires is that it allows us to more accurately describe how social control unfolds in couples' discussions. Moreover, existing measures of social control are not structured to provide researchers with information about specific behaviors that spouses' target (or do not target) for social control in HNC. Rather, they instruct patients to rate the frequency with which their spouses/partners use different types of social control tactics (e.g., asking, bargaining, try to make them feel guilty) to influence them to manage their health (Lewis & Butterfield, 2007; Lewis & Rook, 1999). During HNC, multiple, complex self-care tasks are required to effectively manage symptoms, but we do not currently know where spouses are concentrating their social control efforts, whether spouse social control in this context is largely positive or negative, what effects spouse social control has, and whether there are gaps (in terms of self-care behaviors that spouses could be targeting but are not) that can be addressed in future couple-based psychoeducational interventions. With this in mind, we asked the following research questions:

1. What self-care activities are the targets of spouse social control in HNC? We chose to focus specifically on social control that spouses used to regulate patient self-management of treatment-related side effects as opposed to health behaviors in general because coping with side effects has been identified as a major source of distress and an unmet supportive care need for both HNC patients and their spouses (Henry et al., 2013).
2. What types of social control do spouses use to encourage patient adherence to self-care protocols in HNC? To answer this question, we examined how often spouses used social control during their discussion with the patient when discussing self-care and the management of side effects, the valence of those tactics (i.e., positive or negative), and whether spouses' use of social control varied depending on the target self-care behavior that they were discussing with the patient.

3. How does spouse social control affect patient and spouse mood and self-efficacy? In order to gauge the immediate impact of spouse social control during couples' discussions in the lab, we examined associations with patient and spouse mood following the discussions. Given the descriptive nature of this study and the fact that the timing of couples' discussions in the laboratory occurred at the start of radiotherapy for HNC - before patients had established self-care routines, we examined associations between spouse social control during couples' discussions and patients' and spouses' sense of self-efficacy immediately following the discussions (as opposed to actual behaviors). Finally, we chose to look at the impact of spouse social control on both patients and spouses because a recent study found that individuals who exerted more social control over their diabetic spouses' diet experienced greater caregiver burden (August, et al., 2011). Thus, more information is needed to identify and understand the deleterious consequences that engaging in social control could have on the spouse as well as the patient.

METHODS

Procedure

This study was part of a larger study of spousal communication and adjustment to head and neck cancer that was approved by the Institutional Review Board of a large comprehensive cancer center in the southwestern United States. Patients were identified through medical chart review and approached to participate during their routine clinic visits. Patients and spouses were eligible if the: 1) patient was initiating radiotherapy for newly diagnosed HNC; 2) patient had a physician-rated Eastern Cooperative Oncology Group (ECOG) performance status score of 2 or less (i.e., ambulatory and capable of all self-care but unable to perform any work activities); 3) patient could vocalize well enough to complete a videotaped spousal interaction task in the research laboratory; 4) patient had a spouse or significant other with whom he/she resided; 5) research staff were able to contact the spouse to determine his/her eligibility; 6) patient and spouse were at least 18 years old; 7) patient and spouse could provide informed consent; and 8) patient and spouse could speak, read, and understand English.

All eligible couples who were approached in the clinic were asked to complete a brief (one-page) anonymous questionnaire that asked about their health and socio-demographic characteristics, regardless of whether or not they ultimately consented to participate in the study. Couples who provided informed consent came to the research laboratory to participate in a semi-structured spousal interaction task that was modeled after Gottman's marital observation protocol (Gottman, 1979; Gottman & Notarius, 2000) in which patients presented a cancer-related concern to their partners. The procedure has been used in previous marital interaction studies in cancer (Dagan et al., 2014; Manne et al., 2004). To facilitate discussion, patients were given a cancer issue inventory that consisted of 18 commonly experienced problems/concerns experienced by individuals coping with cancer (e.g., fears or worries about death, side effects, treatment decisions) that was adapted from Manne et al. (2004) and asked to select one that caused them considerable concern or

distress. If the patient felt that none of the topics was sufficiently concerning or distressing, he/she could choose his own topic.

Consistent with previously published observational studies using this procedure (Dagan, et al., 2014; Gottman & Notarius, 2000; Manne, et al., 2004), once a topic was chosen, the research assistant instructed couples to discuss the issue as they normally would for 10–15 minutes, and then left the room. Following the discussion, patients and partners each rated the discussion in terms of how ‘typical’ it was of discussions at home, how helpful it was, and how it made them feel. Participants each received \$25 gift cards for their time. All of the recorded interactions were then transcribed and the transcriptions were verified by research staff against the recording.

Measures

Social control—We developed a codebook that specified 14 different forms of social control and their indicators based on previously published work (Lewis & Butterfield, 2007; Tucker & Anders, 2001). The seven types of positive social control were: bargaining, offering to help, using logic/explaining, offering to do the behavior together, positive reinforcement, reminding, and hinting/suggesting. The seven types of negative social control were: comparing, criticizing, demanding, nagging, threatening, using fear, and using guilt.

Two coders reviewed the transcripts and identified those in which side effects were discussed. For each transcript where side effects were discussed, coders identified the target behavior that was being discussed and counted the number of times different social control tactics were used by spouses during the couple’s discussion. Discrepancies between coders were resolved through mutual discussion.

Mood—Following the discussion, patients and spouses rated the intensity of their *own* mood at that moment on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (extremely) using two adjectives (happy, sad) from Larsen and Diener’s (1992) circumplex model of affect. They also rated how angry they were at that moment on the same 7-point Likert-type scale.

Self-efficacy—Patients and spouses rated the question, “How confident did you feel after this discussion?” on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very much). We used a single item because we were concerned about participant burden and because previous research has shown that single-item self-efficacy measures perform comparably to longer, more cumbersome measures (Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011).

Discussion ratings—Patients and spouses rated the discussion in terms of how typical it was of discussions that they usually have at home on a scale of 1 (not at all typical) to 7 (very typical). They also rated how helpful the discussion was on a scale of 1 (not at all) to 7 (very much).

Other measures—Medical information (e.g., stage, disease sub-site, time since diagnosis) were abstracted from patients’ electronic medical records. Prior to engaging in the laboratory discussion, patients and spouses provided demographic information (e.g., age,

gender, marital status, race/ethnicity, employment status, length of marriage). For descriptive purposes, marital satisfaction was also assessed at this time for patients and spouses using the Quality of Marriage Index (QMI), which is a six-item self-report measure (Norton, 1983). Scores range from 6–45; higher scores indicate greater satisfaction. A score of 29 corresponds to the commonly used cutoff score of 98 on the Dyadic Adjustment Scale (Spanier, 1989), which distinguishes distressed from non-distressed couples (Heyman, Sayers, & Bellack, 1994). In this study, internal consistency reliability for the QMI was high (Cronbach's $\alpha = .94$ for patients and $.89$ for spouses).

Data Analysis

In order to identify the types of self-care behaviors that spouses targeted for social control, categorized lists were created based on the specific behavior being discussed (e.g., staying hydrated, eating nutritious foods, doing swallowing exercises). For each transcript, the number of times that spouses used social control when talking about these behaviors was tallied. Counts were then summed across transcripts, and percentages were calculated by dividing the total number of times that social control was used by the spouse to influence a specific self-care behavior by the total number of social control attempts.

To identify the types of social control that spouses used to encourage patient self-care, for each transcript, we tallied the number of times that spouses engaged in the different types of social control that we specified in our codebook. We then created positive and negative scores by summing the scores for the seven positive codes and the seven negative codes. To further contextualize our findings, coders recorded the different justifications/explanations that spouses provided for engaging in social control as well as patients' responses to their spouses' use of social control. The data were conceptually ordered into categories of spouse justifications (e.g., because the spouse felt the patient was not adhering to the prescribed regimen, etc.) and responses (e.g., patient agreed, disagreed, became defensive). All coder differences were discussed and resolved through continued comparative analysis of the data.

Finally, in order to better understand the associations between spouse social control, patient/spouse mood, and patient/spouse self-efficacy, we first tallied all of the instances of spouse positive and negative social control. Patient and spouse ratings of their own mood (happy, sad, angry) and patient and spouse ratings of their own self-efficacy following the discussion were then regressed on the number of times that spouses engaged in positive and negative social control tactics.

RESULTS

Recruitment and Participant Characteristics

Three-hundred three consecutive couples in which one spouse was an HNC patient were approached to participate. Of these, 50 (17%) were ineligible (in 23 cases the patient did not have a primary HNC; in 6 cases the patient/spouse did not speak English; in 20 cases we were unable to contact the spouse to determine eligibility/interest; and in 1 case, the spouse could not provide informed consent). Sixty couples (20%) declined (30 were too busy/there was too much going on, 23 were not interested, and 7 did not want to be videotaped).

Comparisons were made between participants and decliners based on available data at the time of recruitment for age, time since diagnosis, ECOG performance status, race, education, and NCCN distress thermometer scores (0=no distress to 10=extreme distress). The only significant difference was for education level ($t = -2.47, p = .01$). Although patients who participated were more likely to have at least some college level credits and those who declined were more likely to not have attended college, 73% of all patients who were approached had at least some college level credits.

Given that HNC patients experience progressively worsening symptoms over the course of treatment that can severely impair their ability to function and vocalize, we had a short window to recruit and schedule couples to come to the laboratory. We made every effort to schedule visits shortly after recruitment, but this was not always possible due to work, travel, and treatment schedules. In the end, all couples who completed the laboratory discussion task did so within 4 weeks of initiating treatment; however, 68 couples (35%) who consented withdrew from the study before completing the spousal interaction task. Reasons were: The patient was experiencing side effects and was no longer feeling up to it ($N = 24$); the couple was too busy/had too much going on ($N = 30$), and the couple had changed their minds and no longer felt comfortable being videotaped ($N = 14$).

Comparisons between participants and withdrawals showed that participants had better ECOG performance status scores than did those who withdrew ($t = 1.80, p = .07$) and that couples in which the spouse had greater distress at recruitment (NCCN distress thermometer scores greater than 4) were significantly more likely to withdraw than were couples in which the spouse had lower distress levels ($t = -1.95, p = .02$). The final sample comprised 125 heterosexual couples who completed the videotaped spousal interaction task. See Table 1 for demographic and medical characteristics.

Discussion Topics/Ratings and Descriptive Findings

Sixty-eight (54%) of the 125 couples that participated talked about side effects. Other topics that were discussed included: fears/concerns about the future (21%), role changes (10%), social/family/relationship issues (8%), and other medical/financial concerns (7%). The side effects that were most frequently identified by patients as being a topic of concern were: problems with eating/drinking (26%), oral complications (e.g., mucositis, xerostomia; 21%), pain (15%), and problems with speech/swallowing (11%). Patients also frequently identified more than one side effect as being a topic of concern during their discussions (range = 1 to 7, $\bar{X} = 1.5$ ($SD = 1.68$)).

In terms of ratings, spouses rated the discussion as slightly more helpful [$\bar{X} = 6.35$ ($SD = .98$)] than did patients [$\bar{X} = 6.04$ ($SD = 1.18$); $t = -1.87, p = .06$]. In addition, the mean rating for how typical the laboratory discussion was of the couple's everyday discussions was $\bar{X} = 5.59$ out of 7 ($SD = 1.33$) for patients and $\bar{X} = 5.53$ ($SD = 1.62$) for spouses. No gender differences were detected with regard to either rating.

Both patients ($\bar{X} = 39.77, SD = 8.67$; Range 6 to 45) and spouses ($\bar{X} = 39.04, SD = 7.31$; Range 6 to 45) reported high levels of marital satisfaction. Only 9% of patients and 7% of spouses scored below the QMI cut-off for marital distress. As Table 2 shows, no significant

differences between patients and spouses with regard to happy or angry mood or self-efficacy following the discussion were found. However, spouses reported greater sad mood following the discussion than did patients. Spouse marital satisfaction was not significantly associated with the number of times spouses engaged in positive ($r = .11$, $p = .43$) or negative social control ($r = -.06$, $p = .70$). In addition, partial correlations showed that patient and spouse self-efficacy and mood were not significantly associated with one another.

Patient behaviors that were the targets of spouse social control

Evidence of the use of spouse social control was noted in 90% (61 of 68) of the discussions about side effects. Across conversations, 178 instances of social control were coded, and the average number of control tactics used per discussion was 2.92 ($SD = 3.04$). Patient behaviors that were most often the targets of spouse social control were: maintaining weight/eating a nutritious diet, maintaining proper hydration, and practicing swallowing exercises. Taken together, these three self-care behaviors were the target in 73% of all cases where spouses engaged in social control. In contrast, spouses used social control to encourage their loved one's to engage in dental/oral care only 7% of the time, and to encourage pain management, 8% of the time.

Types of social control that spouses used to encourage patient self-care

As table 3 shows, the most frequently used positive social control tactics were: offering to help/support the patient, using logic/explaining, and reminding. The most frequently used negative tactics were: criticizing, demanding, and nagging. Overall, the number of positive (51%) and negative (49%) social control tactics used by spouses were roughly equal. However, 43% (26) of spouses used only positive social control; 20% (12) used only negative social control, and 37% (23) used a combination of both positive and negative social control tactics during their discussion.

To contextualize our findings, coders explored whether spouses provided any justification for their use of social control as well as patient's verbal responses to their spouses' use of social control. As the discussion below illustrates, most spouses explained that the reason they engaged in social control was because they felt it was necessary for the patient's well-being and motivated by love for the patient:

Spouse: So, each time you hear me say, "Did you drink? Did you do your swallows? Did you do your exercises today?" Don't get angry. Just say, she's doin' this for my benefit.

Patient: I will. You're my conscience. [Laugh]

Spouse: I'm doing it for your best interest so you won't have lifelong effects from the radiation. I love you and I want you to be well.

Other reasons spouses gave for engaging in social control were: to support patient adherence, provide assistance with complicated tasks, and to gain a sense of control or reassurance over an otherwise uncontrollable situation. Illustrating the latter, one woman said, "I just kinda watch you. Has he done his exercises? Has he done his little routine in the

morning and at night? I don't watch specifically to make sure everything's done – it just helps me to know you're doing your part."

For the most part, patients seemed to understand that their spouses' control efforts stemmed from love and caring for their well-being. For example, one patient told his wife, "I know it's well-intended naggin'." Despite this understanding, patients' acquiescence to their spouses' control attempts varied. For example, even though one man acknowledged that his wife's behavior stemmed from caring, he struggled to change because it meant coming to terms with the impact of his illness on his ability to function. "You're just trying to encourage me to try things that might taste different...What I have to be better at is when you do make those suggestions to be more receptive and open-minded, knowing that my taste and saliva has changed and I need to try something different." Others were less receptive to making changes, but, it was not clear whether this was because they viewed their spouses' social control as excessive or because they were not yet ready to face what needed to be done.

In some cases, couples experienced conflict. As exemplified below, in all the transcripts in which conflict was identified ($N = 6$), it stemmed from the patient either perceiving a lack of empathy from the spouse or a lack of acknowledgment for the efforts they were taking toward the behavioral goal.

Patient: You're telling me I have to, but if I can't, I'm telling you it's not gonna happen. I'm trying...when I can get the fluids down, I get them down, and when I can eat, I eat. I think sometimes, you're over there and...and you're telling me, "You need to eat. You need to drink," and you don't even realize how hard it is sometimes.

Spouse: No I don't, I don't have a clue. You're right, I don't. I just know what you have to do.... You still have to eat and you still have to swallow.

Echoing that sentiment, another patient said, "Sometimes I feel like you think I really don't know what the hell I'm doing, and that you're the only one who knows what to do. Like with the food — you act like I am not even trying to eat or assuming I don't like what you made and that's just not the case."

Overall, patients were more receptive to spouse social control when their spouses expressed empathy, used humor, stated that their goal was not to nag them, asked their opinion, and provided options. Patients also responded positively when spouses emphasized they were "in this together" or were part of a "team." In some cases, this was conveyed subtly through the use of pronouns and completing each other's sentences, in other cases, it was conveyed more directly:

Spouse: I'm concerned about helping you get through this. I'm on the outside watching, and I'm seeing you deteriorate. I can't help but feel like I can help you. I want to help you. I just hate pushing you. I don't like saying, "You have to do this, you have to do that." (laughs) So, I'm thinking that the spreadsheet we talked about could be the answer. You're gonna design it, you're gonna say how we are going to work together, and I'm gonna be checking ... If you don't check something off,

don't be annoyed by me saying six times a day, "Honey, did you do the mouth wash gargle or the baking soda thing?" I'm just going to have to be a little nit-picker like that.

Patient: Well, there's probably going to be a little bit of tension...

Spouse: I know. I feel it already. I want to support you, I know I might come off as bitchy, but honey, you need to do this.

Patient: Yes, I know, but I might need to be reminded later.

Spouse: [sigh] You know, we are a team in this and I am doing my part. I need you to do your part.

Associations between social control, mood, and self-efficacy

Given that reports of mood and self-efficacy were not significantly correlated for patients and spouses, separate regression analyses were conducted. As Table 4 shows, spouse positive social control during the discussion was significantly associated with patient self-efficacy and happy mood after the discussion, but spouse negative social control was not significantly associated with patient happy mood or self-efficacy. Given that spouse positive/negative social control was not associated with either patient or spouse angry or sad mood or with spouse happy mood and self-efficacy, these results were not tabled.

DISCUSSION

Few studies have sought to develop an understanding of the interpersonal mechanisms that link marriage to better health outcomes in cancer. Using an observational approach, we examined how one interpersonal mechanism, spouse social control unfolds in the context of HNC, how it affects self-efficacy, and how it affects patient and spouse mood. We found that maintaining nutrition/hydration and practicing swallowing exercises were the most frequent behavioral targets of spouse social control, that spouses were just as likely to engage in positive control as they were to engage in negative control, and that receiving positive social control was associated with more self-efficacy and greater happy mood for patients but receiving negative social control was not associated with negative mood or low self-efficacy. Taken together, our findings link spouse social control during couples' discussions about side effects with patient self-efficacy and mood following these discussions. They also provide important clues to researchers interested in developing couple-based psychoeducational interventions to improve patient self-care and adherence during HNC treatment.

Given that weight loss and dehydration were the most frequent topic of patient concern, are a significant sources of distress for families, and a major source of hospitalizations in HNC, it is not surprising that they were the primary focus of spouse social control attempts. However, dental issues, swallowing, nutrition, and pain are all interrelated in HNC, and our data showed that all of these issues were frequently identified by patients as being an issue of concern. In fact, weight loss and dehydration are often directly attributed to the oral side effects of radiotherapy that make it difficult to swallow and taste/enjoy food. Given this, our finding that the management of oral side effects and pain were among the least frequently

targeted behaviors for spouse social control suggests the need for better educational programs that emphasize taking a coordinated approach to self-care that addresses all of these issues.

Our data showed that receiving positive social control from one's spouse was associated with greater patient positive (happy) mood and self-efficacy. Moreover, patients were receptive and reacted positively to social control when their spouses took a team approach that included acknowledging that each person had a role to play in achieving the goals of rehabilitation and communicating that their role was to help problem-solve and provide the patient with the assistance that he/she desired (Berg & Upchurch, 2007; Bodenmann, 1997). Although studies are needed to clarify the circumstances under which social control is likely to influence mood and behavior, our findings are consistent with Lewis and Butterfield (2007) who found that positive, direct, and bi-lateral tactics involving give-and-take between the agent and target of social control were predictive of behavior change.

Our findings partially support the dual-effects model of social control (Hughes & Gove, 1981). Our qualitative data showed that conflicts occurred when spouses used negative control and either failed to express empathy or acknowledge the patient's existing self-management efforts. Although this is consistent with the idea that engaging in negative control may increase the likelihood of spousal conflict, for the most part, patients appeared to understand and appreciate their spouses' control attempts. Moreover, our quantitative data showed that spouse social control was not significantly associated with either patient or spouse negative mood.

One reason why negative control may not have adversely affected patient mood could be that our sample reported high levels of marital satisfaction. In the context of a happy marriage, patients may explain away their spouses' negative behaviors and attribute them to spousal concern. This in turn, may mitigate the potentially adverse effects of negative social control on patient mood. Another reason could be that existing studies have examined the effects of social control on health behaviors in community or chronic illness samples (August, et al., 2011; August & Sorkin, 2010; Lewis, et al., 2006; Lewis & Rook, 1999; Rook, 1995). Spouses may have been more motivated to engage in social control due to the perceived urgency of their loved one's condition and patients may have been more receptive to their spouses' control attempts because they felt their actions were justified. A related issue is that HNC patients are often given detailed behavioral prescriptions for managing side-effects, whereas a spouse's attempts to encourage more global behavioral changes to improve their partner's general health (e.g., by encouraging more physical activity or a healthier diet) may convey a degree of disapproval of the patient's current lifestyle and thus exacerbate distress. Social control to encourage adherence to a detailed behavioral prescription to mitigate a specific health challenge (e.g., dry mouth, dehydration) may be more well-received and appreciated by the patient, and therefore less likely to exacerbate distress. Finally, it is important to note that the measures for social control that we derived from couples' discussions in a laboratory setting may not capture the frequency of negative social control or correlate strongly with the corresponding interpersonal processes in couples' daily lives.

In addition to spouses' being motivated by a sense of concern, our findings suggest that spouse social control attempts were at least partially motivated by a need to gain a sense of control over an otherwise uncontrollable situation. Despite this, we found no significant associations between the number of control attempts spouses made during their discussions of side effects and their mood following these discussions. Given the topic that couples were discussing and the fact that spouses reported greater sad affect following the discussions than patients, it is possible that other aspects of the discussions had a more salient effect on spouse mood than did their own social control attempts. Moreover, while taking up a position of social control could be burdensome for a spouse who is acting as a cancer career, it could also be more distressing and burdensome for the spouse to watch passively as his/her loved one is suffering due to non-adherence. Given this, more work is needed to determine the effects of engaging in social control on a wider range of spousal outcomes as well as the implications of patient non-adherence for the spouse (in terms of caregiver burden and distress).

Strengths and Limitations

We had a considerable number of refusals and couples who dropped out prior to completing the laboratory discussion. While this was mostly due to the intensive physical and scheduling demands involved with undergoing radiotherapy, it is possible that our findings underestimate social control attempts and do not capture other potential associations that might exist in couples that are managing more stress, poorer health, or experiencing greater marital distress. Another limitation is that our sample was predominantly white, middle class, and well educated. Although this reflects the changing demographics of HNC (Wilson, Holewa, & McGrath, 2011), our findings should be validated with samples that have more minority and less well-educated couples. Our sample also was limited by a small number of couples in which the patient was female, and this precluded our analysis of potential gender differences. This issue notwithstanding, men are affected significantly more than females with a ratio ranging from 2:1 to 4:1, so our sample of patients was representative with regard to gender (Siegel, et al., 2014). Another limitation was that we combined having a spouse with having an unmarried live-in partner, rather than simply considering marital status. At least one study in HNC has suggested that cohabitation status and not marital status may be the important variable to measure (Konski, et al., 2006). Moreover, Lund et al (2002) observed 1,265 older men and women and found that cohabitation status was a stronger predictor of mortality than was marital status. More work is needed to further clarify these associations. In the same vein, we did not restrict participation to heterosexual couples, but all of the patients who participated were in a heterosexual relationship. Very little is known about how support processes in cancer differ among couples where both partners are men/women compared to couples comprising a man and a woman and more research is needed in this area.

The observational method that we used and the rating of concrete behaviors allowed us to examine actual instances of spouse social control and avoid problems that may have plagued previous studies of social control that relied solely on self-report such as same-method variance and memory distortions. Indeed, some researchers have posited that observational methods may better capture how couples actually talk about cancer than self-report

measures (Dagan, et al., 2014). At the same time, we recognize that even though the laboratory-based discussion format that we used in this study is a standard protocol in observational marital research (Gottman, 1979; Gottman & Notarius, 2000; Weiss & Heyman, 1990) and has been used previously in cancer (Dagan, et al., 2014; Manne, et al., 2004), it might be somewhat artificial. Across discussions, spouses used an equal number of positive and negative control tactics, and the proportion of conflict-laden discussions was only 10% (N = 6) of all the discussions of side effects. Although it is possible that the frequency of conflicts and negative social control tactics were affected by the presence of the taping device, the vast majority of couples indicated that they were comfortable during the discussion and that their discussions were typical of those at home. A more probable explanation is that the timing of the laboratory discussion was a factor. Given practical considerations, lab sessions were scheduled within the first few weeks of treatment before the onset of severe side effects. It is possible that spouses engage in more negative control tactics and that couples experience more conflicts when they are dealing with actual instances of non-adherence and severe side effects, as opposed to more mild side effects and/or the threat of the onset of possible side effects.

We did not collect data regarding whether patients were already engaging in self-care behaviors or whether spouse social control was necessary or warranted. Due to the timing and nature of the spousal discussions we observed, self-care routines were likely not yet established. Although our finding that positive social control attempts were significantly associated with patient mood and self-efficacy despite this limitation provides a potentially more conservative test of our hypothesis, future studies should compare the effects of positive/negative control attempts when the patient is already engaging in self-care to when he/she is not engaging in self-care or needs assistance with care routines.

We were unable to examine actual facilitative behaviors that spouses used to regulate patient behaviors, but a few were mentioned during couples' discussions. Examples include making a special box for the patient to keep his oral care solutions handy, formulating a chart to keep track of oral care, and buying flavored water to encourage hydration. These facilitative behaviors may be used by spouses as a subtle form of social control instead of overtly discussing issues with the patient. More work is needed to understand when spouses use conversational tactics as opposed to facilitative behaviors to engage in social control as well as their respective effects on patient mood and behavior. Finally, we quantified aspects of couples' discussions as a way of capturing the importance of different social control tactics, but the number of mentions was small, and the conclusions drawn should not be overgeneralized until studies replicate the information presented.

Overall, the limitations of this study are balanced by its strengths, which include: 1) looking at social control tactics that were used in couples' actual conversations as opposed to interviews or self-reports; 2) including patients and spouses and looking at the impact of social control on the outcomes of both; 3) using observational methods to investigate social control in the context of a life-threatening illness. Our findings suggest that HNC couples may benefit from programs that emphasize the importance of the regular practice of self-care routines to control oral side effects, pain, and nutrition/hydration problems. They also suggest that interventions that target the couple and teach spouses to minimize the use of

negative social control may help to ease spousal tension and minimize conflicts over caregiving and symptom management. Indeed, the family therapy literature has shown that people can become aware of the precursors to negative interactions and be taught to alter these patterns (Johnson, 2004). Thus, this is an area that is amenable to intervention. Finally, encouraging spouses to maximize their use of positive social control may help boost patients' positive mood during treatment and empower them to engage in recommended self-care behaviors. Such programs hold great promise for controlling symptoms, speeding rehabilitation, and improving patient quality of life.

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Table 1

Demographic and Medical Characteristics of the Sample (N = 125 couples)

	<u>Patients</u>	<u>Spouses</u>
Gender (%)		
Male	108 (86.4)	17 (13.6)
Female	17 (13.6)	108 (86.4)
Age in years	$\bar{X} = 57.11$ SD = 9.99 Range = 32 to 81	$\bar{X} = 55.24$ SD = 10.39 Range = 28 to 78
Race (%)		
White (non-Hispanic)	113 (90.4)	110 (88.0)
Marital status (%)		
Married	119 (95.2)	
Cohabiting	6 (4.8)	
Length of marriage in years	$\bar{X} = 25.0$ SD = 14.7 Range = 2 weeks to 56 years	
Employment status (%)		
Full-time	63 (50.4)	59 (47.2)
Part-time	6 (4.8)	16 (12.8)
Unemployed	19 (15.2)	28 (22.4)
Retired	16 (12.8)	16 (12.8)
Unknown	11 (8.8)	6 (4.8)
Type of HNC (%)		
Oral cavity	20 (16.0)	
Laryngeal	3 (2.4)	
Pharyngeal		
Oropharyngeal	74 (59.2)	
Nasopharyngeal	8 (6.4)	
Hypopharyngeal	7 (5.6)	
Nasal cavity and paranasal sinus	6 (4.8)	
Other (e.g., Thyroid)	7 (5.6)	
Stage of cancer (%)		
1	9 (7.2)	
2	4 (3.2)	
3	13 (10.4)	
4	85 (68.0)	
Unknown	14 (11.2)	

Table 2

Descriptive Statistics for Mood and Self-Efficacy in Patients and Partners

	Patient	Spouse		Partial
	<u>Mean(SD)</u>	<u>Mean (SD)</u>	<u>t</u>	<u>Correlation (r)</u>
Happy mood	5.50(1.38)	5.40(1.45)	.45	.22~
Sad mood	1.41(.97)	2.07(1.55)	-2.99*	.20
Angry mood	1.07 (.26)	1.11(.37)	-.90	.17
Self-efficacy	5.92 (1.12)	5.75(1.45)	.74	.11

Note:

~ p<.10,

* p<.01;

SD = standard deviation; t= t-test

Table 3

Observed Spouse Social Control Attempts During Couple Discussions of Side Effects in the Lab

Tactic	Total Number (%)
Positive	91 (51%)
Bargaining	3 (2)
Offering to help/support	20 (11)
Using logic/explaining	20 (11)
Offering to do the behavior together	4 (2)
Positive reinforcement	14 (8)
Reminding	19 (11)
Hinting/Suggesting	11 (6)
Negative	87 (49%)
Comparing	1 (1)
Criticizing	30 (17)
Demanding	19 (11)
Nagging	18 (10)
Threatening	9 (5)
Using fear	4 (2)
Using guilt	6 (3)
Total	178

Table 4

Results Showing Patient Happy Mood and Self-Efficacy As A Function of Spouse Positive and Negative Social Control

	b	StdErr	B	t	95% CI	
					Lower	Upper
<u>Outcome: Happy mood</u>						
Intercept	5.15	.24				
Number of spouse positive social control tactics	.26	.13	.26	2.02*	.002	.51
Intercept	5.36	.15				
Number of spouse negative social control tactics	.07	.06	.13	1.19	-.05	.19
<u>Outcome: Self-efficacy</u>						
Intercept	5.64	.19				
Number of spouse negative social control tactics	.21	.10	.26	2.08*	.01	.41
Intercept	5.93	.12				
Number of spouse positive social control tactics	.03	.05	.07	.61	-.07	.13

Note:

*
p<.05,

b = unstandardized coefficient; B= standardized coefficient; StdErr = standard error; t = t-test; CI=confidence interval