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BRIEF COMMUNICATION

Causal attributions and their impact on psychosocial functioning in head and neck cancer patient–caregiver dyads: a preliminary, longitudinal study

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Abstract

Purpose This longitudinal study explores causal attributions in newly diagnosed head/neck cancer (HNC) patients and their caregivers.

Methods Perceptions of causal attributions and associated level of responsibility regarding each patient's HNC diagnosis at baseline ($n = 72$ dyads) were described and then tested as predictors of depressive symptoms, cancer worry, and perceived support 6 months later.

Results When causes were reported, tobacco and alcohol use topped the list of both patients and caregivers. Three-quarters of dyads agreed about perceptions of the patients' responsibility in causing their HNC. Some dyad-level patterns of causal attribution were associated with patients' and caregivers' cancer worry ($p < 0.05$) and caregivers' perceived support ($p < 0.05$) in unadjusted models.

Conclusions This preliminary study indicates that causal attributions warrant further exploration in HNC patient–caregiver dyads specifically, as well as studies of quality of life in patient–caregiver dyads more broadly considered.

Keywords Cancer · Causal attributions · Distress · Dyads · Social support

Introduction

Cancer patients may use causal attributions (CA), including perceptions of responsibility, to find meaning in illness. Due to head/neck cancer's (HNC) strong behavioral ties [1], the significance of CA and the experiences of stigma, blame, guilt, and motivation to change behavior are noteworthy. Indeed, HNC patients' self-blame is associated with poor physical and social functioning [2], and self-blame and perceived control interact to predict smoking post-diagnosis [3]. As HNC can lead to significant life disruption and quality of life impairments [4, 5], CA may carry import as patients and caregivers [6] navigate their "new normal." Thus, understanding the nature of CA in HNC patient–caregiver dyads may uncover a new target for quality of life interventions that focus on psychosocial functioning. This article describes a preliminary study of CA in HNC dyads, and examines whether dyad-level patterns of CA prospectively predict psychosocial outcomes.

Methods

Participants and procedure

In this IRB-approved study, first primary HNC patients ≥ 21 years old with stage I–IVA cancer were screened for eligibility prior to treatment initiation at a US cancer center. Patients were excluded if they were not English literate or

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had serious cognitive challenges. Eligible, interested patients nominated their caregivers for participation. After informed written consent, patients and caregivers completed separate questionnaires by phone or mail at baseline and 6 months later. Gift cards were provided for compensation (baseline: $25, 6 month: $15). Other procedural details, including enrollment rate, are elsewhere [7].

Measures

Background (baseline)

Questions assessed demographics, health behaviors, and dyad relationships. Patients' symptom severity was measured with the MD Anderson Symptom Inventory [8] ($\alpha s \geq 0.89$). Patients' medical records were reviewed.

CA (baseline)

Participants were asked in an open-ended question to report up to three perceived causes of the patients' HNC. Responses were transcribed verbatim, and two reviewers independently coded each CA for type (e.g., sun exposure, HPV, stress) and responsibility (i.e., within versus outside patients' control). As examples, smoking (e.g., "He smoked a lot") was coded as within patients' control while environmental exposure (e.g., "The chemicals at my job") was coded as outside patients' control. An overall perceived responsibility score (yes vs. no) took into consideration all reported CA by each participant. For example, if a caregiver identified both alcohol use and genetics as causes of the patient's cancer, then their overall perceived responsibility score was coded as "yes" because alcohol use was considered "within" a patient's control; however, if a caregiver identified genetics alone as a cause, then the overall perceived responsibility score would be coded as "no" because genetics were considered "outside" a patient's control. The codebook, which included operationalization of all codes and a hierarchical organization to said codes, is available upon request to the corresponding author.

Psychosocial functioning (baseline and follow-up)

Depressive symptoms were measured using the 10-item Center for Epidemiologic Studies Depression Scale [9, 10] ($\alpha s \geq 0.80$). Cancer worry was assessed with the 5-item Assessment of Survivor Concerns [11] ($\alpha s \geq 0.85$). Support from the other dyad member was assessed with the 4-item Guidance Subscale of the Social Provisions Scale [12] ($\alpha s \geq 0.70$).

Data analysis

Based on each participant's overall perceived responsibility score, dyads were assigned to one of the four groups to denote patients'/caregivers' CA: yes/yes, yes/no, no/yes, no/no. To explain further, in the yes/yes group, both the patient and caregiver reported at least one cause of the patient's cancer that was within her or his control. In contrast, in the no/no group, neither the patient nor caregiver reported a cause that involved something within the patient's control. Student's *t* tests and pairwise comparisons were conducted to examine whether psychosocial functioning at follow-up varied between groups. ANCOVA models with adjustments for the outcome at baseline, age, and patients' symptom severity were also conducted. In all analyses, the yes/yes group was the reference; $p < 0.05$ determined statistical significance.

Results

Sample characteristics

Seventy-two dyads completed the baseline with 57 (79.17%) retained at follow-up; six patients died while the rest was lost to follow-up. Most patient–caregiver relationships were romantic (56.94%, $n = 41$); others were familial (mostly siblings or parent–child) or platonic. Participants were, on average, roughly 60 years old (patients = 60.65 ± 11.68 years old; caregivers = 58.12 ± 11.95 years old). Patients and caregivers were mostly White non-Hispanic (83.33%, $n = 60$) and partnered (66.67%, $n = 48$ and 80.56%, $n = 58$, respectively). Patients were predominately male (73.61%, $n = 53$), whereas caregivers were predominately female (76.39%, $n = 55$). Patients and caregivers tended to report post-high school education (59.72%, $n = 43$ and 66.67%, n = 48), but patients were less likely to be employed (37.50%, $n = 27$ vs. 58.33%, $n = 42$). The 30-day point prevalence of smoking and heavy alcohol use (drinking ≥ 2 times per week with 3–4 drinks per occasion and/or a 30-day point prevalence of binge drinking) was twice as high in patients than caregivers: 51.40% ($n = 37$) and 25.00% ($n = 18$) vs. 25.00% ($n = 18$) and 12.50% ($n = 9$), respectively.

The most common HNC sites were oral cavity (31.94%, $n = 23$) and oropharynx (25.00%, $n = 18$). Most patients had Stage IVA disease (61.11%, $n = 44$). Treatment consisted of surgery [78.57%, $n = 55$ (2 unknown)], radiation (58.57%, $n = 48$ (2 unknown)), and/or chemotherapy

[52.17%, $n=36$ (3 unknown)]. Patients' symptom severity was low (2.80 ± 1.99).

CA

In describing what caused each patient's HNC, more than half of patients (52.77%, $n=38$) and caregivers (54.17%, $n=39$) reported multiple causes. The top three causes reported by patients were tobacco (51.39%, $n=37$), alcohol (19.44%, $n=14$), and environment (11.11%, $n=8$) while caregivers identified tobacco (50.00%, $n=36$), alcohol (26.39%, $n=19$), and genetics (13.89%, $n=10$) (Fig. 1). Among patients, 81.10% ($n=30$) of current smokers reported tobacco as a cause while 31.30% ($n=5$; 2 missing) of heavy drinkers reported alcohol as a cause.

Patterns of perceived responsibility varied across and within dyads. Across dyads, 42.29% ($n=31$) of patients and 39.44% ($n=28$) of caregivers attributed the entire cause to something within patient's control (e.g., smoking), whereas 32.86% ($n=23$) of patients and 38.03% ($n=27$) of caregivers attributed it to something outside patient's control (e.g., "bad luck"); apart from two patients and one caregiver who made zero attributions, the remainder made attributions that reflected some combination of responsibility. Within dyads with complete data ($n=69$), three-quarters agreed about the patient's level of responsibility, with 52.17% ($n=36$) concurring the patient was at least partially responsible and 21.74% ($n=15$) concurring the patient was not at all responsible. In 26.09% of dyads ($n=18$), there was disagreement, with 61.11% ($n=11$) of patients versus 38.89% ($n=7$) of caregivers alone attributing at least partial responsibility to patients.

Dyadic perceptions of responsibility and psychosocial functioning

The association between dyadic perceptions of patients' responsibility in causing HNC ("global responsibility") and psychosocial functioning at follow-up varied by outcome (Fig. 2). Neither patients' nor caregivers' depressive symptoms nor patients' perceived support were associated with global responsibility. However, patients reported less cancer worry when both parties agreed the patient was not responsible ($p=0.01$) and caregivers reported less cancer worry as long as the patient did not perceive himself or herself as responsible (ps = 0.01 and 0.04). Finally, caregivers reported less support from patients when caregivers alone thought the patient responsible ($p=0.03$). No statistically significant differences remained in adjusted analyses.

Discussion

Similar to a study where HNC patients often made internal CA [2], in this study, patients and caregivers alike frequently attributed the patient's cancer to tobacco use, and to a lesser extent, alcohol use. Like many other health-related threats to quality of life (e.g., cardiac disease, stroke), the cause of any individual cancer may be impossible to pinpoint; however, the aforesaid finding suggest some HNC patients and caregivers have an accurate

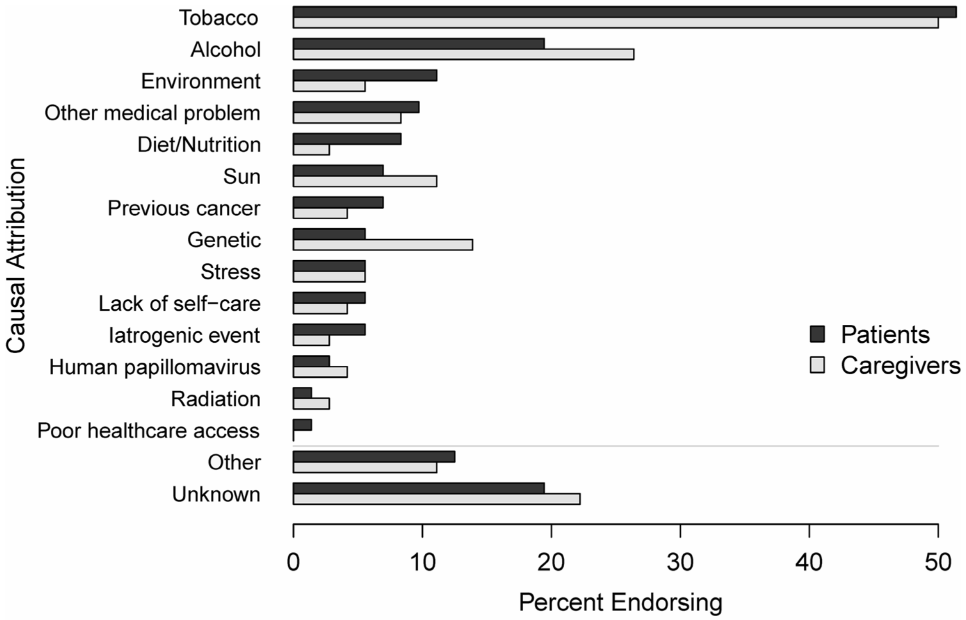

Fig. 1 HNC causal attributions

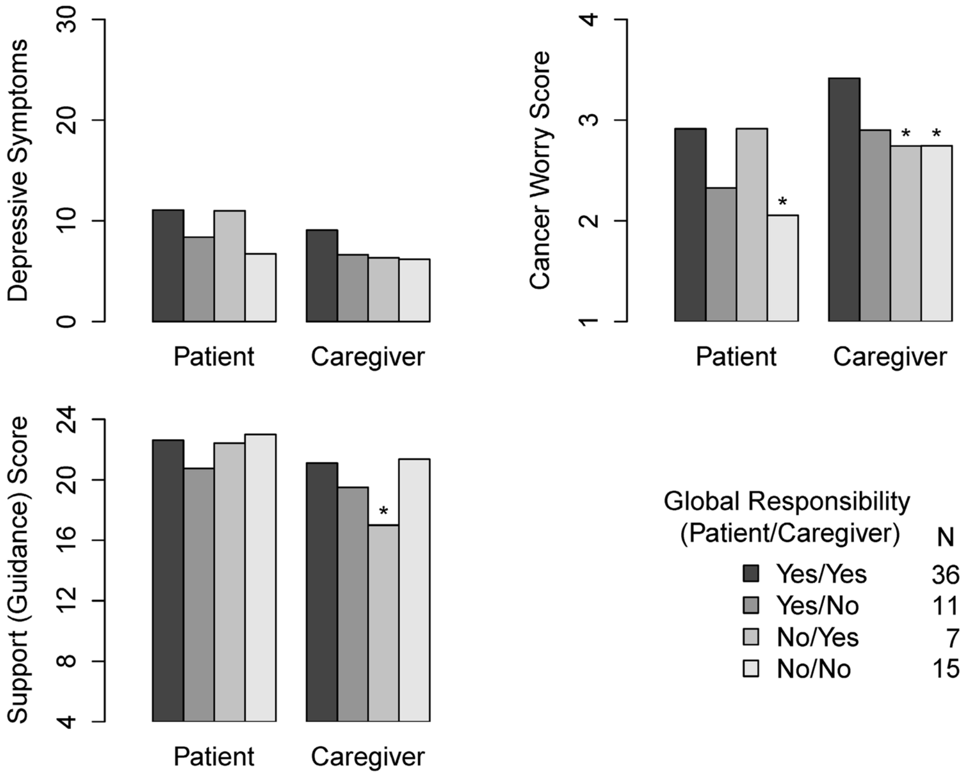

Fig. 2 Dyadic perceptions of patient's responsibility and its relationship to psychosocial functioning at follow-up. Mean score by dyad category. Descriptive statistics (*M* ± SD) for patients' psychosocial functioning at baseline and follow-up: Depressive symptoms = 11.94 ± 7.51 and 9.47 ± 6.87; Cancer worry = 2.83 ± 0.89 and 2.65 ± 0.89; and Support = 22.86 ± 2.51 and 22.48 ± 3.28. Descriptive statistics (M ± SD) for caregivers' psychosocial functioning at baseline and follow-up: Depressive symptoms = 10.10 ± 6.06 and 7.52 ± 5.35; Cancer worry = 3.07 ± 0.73 and 3.05 and 0.81; and Support = 20.86 ± 4.00 and 20.58 ± 4.46. Statistical significance is based on pairwise Student's *t* tests. *$p < .05$ when compared to 'Yes/Yes' category

understanding of the foremost behavioral causes of HNC [1]. Such CA could present a "teachable moment" for health behavior change [13], but they could also be associated with fatalistic beliefs, guilty feelings, and low self-esteem, all of which have negative implications for quality of life and any of which could undermine motivations to abstain from tobacco and/or alcohol use [14]. As for implications on patient–caregiver interactions, such attributions might negatively influence how caregivers view or treat patients [15] and hinder dyadic adjustment [16].

Outside of tobacco and alcohol use, many other CA were identified, with some, but not all scientifically based. To illustrate, it is well established that genetics and HPV are risk factors for HNC [1], yet the number of participants who made these CA is similar to that who identified stress as a causal factor. Also, in a departure from other recent cancer studies, few participants identified religious/spiritual factors as a causal factor [17, 18]. Finally, and similar to a study with lung cancer patients [19], about one-third of participants reported uncertainty about the cause of patients' HNC. This last finding is of particular importance, as uncertainty about the origin of chronic diseases and serious illnesses can impact coping strategies, disease self-management, and quality of life [20–22]. Altogether, this study highlights need for more education about risk factors for HNC alongside greater acceptance of the uncertainty that comes with any major health-related threat.

Other study findings concern the extent to which dyadic perceptions of perceived responsibility impact psychosocial functioning. Patients' and caregivers' cancer-specific worry was typically diminished when patients did not perceive themselves as responsible, but this did not extend to depressive symptoms. The lack of a significant association between CA and depressive symptoms is consistent with work in palliative care patients [23], but here it could be due to restriction of range in the outcome. Lastly, caregivers perceived less support if they alone held patients responsible for their cancer, which raises the possibility that caregivers experience social constraint and its ill effects in the same manner as do patients [24]. All of the above must be couched within the understanding that no significant longitudinal associations remained after adjustments for covariates, as sometimes occurs in small studies [24, 25].

In conclusion, this study highlights CA as a topic of further investigation for quality of life research. The longitudinal design and enrollment of caregivers is a good extension of prior research, but the small sample limits statistical power and rules out subgroup analyses, which is an important methodological shortcoming. Nonetheless, this study showcases the diversity of CA and hints at the possibility that they contribute to psychosocial functioning after cancer diagnosis, a topic of particular relevance for other behaviorally linked chronic diseases and serious illnesses.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. This research was supported by the American Cancer Society [MRSG-12-221-01-CPPB]; the National Center for Advancing Translational Sciences [UL1TR000062]; and the National Cancer Institute [P30 CA138313, K07 CA181351]. Its content is solely the responsibility of the authors and does not necessarily represent the official views of the American Cancer Society or National Institutes of Health.

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