Perceived levels of collaboration between cancer patients and their providers during radiation therapy

by Charlotte T. Lee and Jason C. Wong

ABSTRACT
This study described the patterns within collaborative relationships between patients and health care professionals during radiation therapy (RT). A one-time survey was administered to cancer patients (N=130) receiving RT at one Ontario cancer centre. The key study variables were collaboration between patients and health care providers and participants’ well-being. Participants reported higher levels of collaboration with nurses, radiation oncologists, and radiation therapists than with dietitians, social workers and spiritual support personnel [F(5, 760) = 430.42, p < .001]. Participants with more symptom distress collaborated more with some health care professionals than those with less distress, but this was only true for collaboration with social workers (p < .05) and dietitians (p < .05). We postulated that participants did not require services from dietitians and social workers when symptom burden was low. Future directions regarding integration of patient-centred measures (e.g., self-management education) into interprofessional models for cancer care are discussed.

INTRODUCTION
Patient-provider collaboration reflects positive relationships between patients and their providers, and it is vital to developing self-management skills (Schulman-Green, Jaser, Park, & Whittemore, 2016) and patient satisfaction (Maunder & Hunter, 2016). In the seminal work by Lorig and Holman (2003), patient-provider collaboration was proposed as key to achieving the three types of self-management: psychological, role, and medical (Corbin & Strauss, 1988). Although there is no agreed-upon definition of patient-provider collaboration, collaborative behaviour documented in the non-cancer literature includes patient-provider communication, patient-provider interaction, patients’ participation in decision-making (Vowles & Thompson, 2012), patients’ attachment style to providers (Maunder & Hunter, 2016), decision-making, and therapeutic alliance (Arbuthnott & Sharpe, 2009).

Little is known about collaboration with health care providers among patients receiving radiation therapy (RT). The adverse effects associated with RT are often different from other modalities of cancer treatment, which warrant distinct investigations in supporting care and patient self-management (Yarbro, Wujcik & Gobel, 2013). In one study of Thai patients’ experiences in coping with radiation treatment-related fatigue (Lundberg & Rattanasuwan, 2007), patients felt that collaboration with radiation oncologists and nurses helped.

The purpose of our study was to examine the patterns of patient-provider collaboration among patients undergoing RT. Our research questions were: (a) Which health care providers do cancer patients perceive they collaborate with during RT? (b) Are there differences in the perceived levels of collaboration between cancer patients and different groups of health care providers during RT? and, (c) Are there differences in the perceived levels of collaboration between patients with different levels of symptom distress?

METHOD
Design and Setting
A survey was administered between September 2014 and December 2016 at a cancer centre in Ontario, Canada. This study was part of a larger project that examined the association between patient-provider collaboration and self-management.

Participants
We recruited a convenience sample of 130 cancer patients during their RT. The inclusion criteria were (a) ability to provide informed consent in English, (b) age 18 or above at the time of recruitment, (c) undergoing RT for cancer at the time of study and finished at least 50% of the prescribed radiation (to ensure that participants had developed collaborative relationships), and (d) Eastern Cooperative Oncology Group (ECOG) status 0 to 2, indicating reasonably good functioning. There were no exclusion criteria.

Study Variables and Instrumentation
The main study variable was perceived collaboration with providers. Demographic information (e.g., age, gender, diagnosis, treatment regime) and well-being was also collected. For patients’ perception of collaboration, a seven-item...
A relational-coordination survey was used (Gittell, 1999). Participants were asked to rate, for each of the professional groups serving the radiation oncology clinic, the frequency or intensity of interactions and collaborative behaviour on a five-point Likert scale. The response options ranged from “not at all” (which would be coded as a numeric value of “1”, reflecting no collaboration) to “constantly” (which would be coded as a numeric value of “5”, reflecting high collaboration). A response of “N/A” was also provided and was coded to a numeric value of “0”. Sample areas explored included “frequent communication”, “problem-solving communication”, “shared goals”, and “mutual respect.” This instrument has been validated in various health care settings, including outpatient clinics which resemble the current study (Hagigi, 2007).

Participants’ well-being was measured by the Distress Assessment and Response Tool (DART) (Li et al., 2016) and the Edmonton Symptom Assessment Scale (ESAS) (Watanabe et al., 2011). DART comprised the Social Difficulty Inventory (Wright, Smith, Keding, & Velikova, 2011) the Patient Health Questionnaire (PHQ9) (Spitzer, Kroenke, Williams & Löwe, 1999), and the Generalized Anxiety Disorder Scale (GAD 7) (Spitzer, Kroenke, Williams, & Löwe, 2006). A 4-point Likert scale was used for all items. All instruments had been validated previously. Acceptable reliability was noted (Table 1).

**Data Collection and Analysis**

Ethics approval was granted from the research ethics boards at one university (REB#2014-229) and the cancer centre where this research took place (REB#0025-1415). Participants were recruited from the radiation review clinic by the study investigators and trained research personnel (authors CL and JW), and gave informed consent to participate in a one-time survey. Participants were given a paper questionnaire while waiting for their clinic appointments, which they could complete while waiting or at home, returning the questionnaire using a post-age-paid envelope provided by study staff.

Descriptive statistics (e.g., frequencies, means) were calculated to describe patterns of patient-provider collaboration. One-way analysis of variance (ANOVA) was used to examine differences in collaboration with different provider groups (independent variable = professional group; dependent variable = mean of sum for relational coordination). Another ANOVA compared means of collaboration with various provider groups by levels of symptom distress, with a lower level indicating below the mean (ESAS ≤ 11) and a higher level indicating above the mean (ESAS ≥ 12). Analysis with DART was not conducted because ESAS scores were predictive of GAD and PHQ within DART. Because ratings for ESAS were low in our study (Table 1), DART composite scores were also low and therefore not included in the present analysis.

**RESULTS**

Table 2 summarizes the participants’ demographics. A total of 130 cancer patients completed the questionnaire. The mean age was close to 62 years. Most participants received radiation

<table>
<thead>
<tr>
<th>Table 1: Study Variables and Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study variable</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Patient-provider collaboration</td>
</tr>
<tr>
<td>Well-being</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Notes. *Range: 1-5, higher = more collaborative. †Range 0-90, higher = more symptom distress. ‡Range 0-63, higher = more difficulties. §Range 0-27, higher = more depressed. ¶Range 0-21, higher = more anxious. ‡Range 0-10, higher = more difficulties.

<table>
<thead>
<tr>
<th>Table 2: Participant Demographics (N = 130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic variable</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Disease site</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Percentage of radiation therapy completed at time of study</td>
</tr>
<tr>
<td>Duration of radiation therapy</td>
</tr>
</tbody>
</table>
treatment for breast cancer and more than half had completed more than 75% of their treatment. Results from the ESAS and DART instruments indicated that participants experienced low levels of physical and emotional distress (see Table 1). Means for the individual ESAS items ranged from 0.91 to 2.48 out of 10.

Responses regarding perceived collaboration with health care providers showed that all the participants collaborated with nurses, radiation oncologists, and radiation therapists at moderate to high levels (means: 21.44 - 29.79 out of 35). Collaboration with social workers, dietitians, and spiritual-support personnel ranged from 2.51 to 4.19 out of 35 (see Table 3).

One-way ANOVA results for differences in patient-provider collaboration by professional group showed significant differences among the ratings [F(5, 760) = 430.42, p < .001]. Post-hoc Scheffe test results showed significantly higher ratings for collaboration with radiation oncologists and radiation therapists than collaboration with nurses, social workers, dietitians, and spiritual-support personnel (p < .001). The ratings for radiation oncologists did not significantly differ from those for radiation therapists. Participants’ collaboration with nurses received the second highest ratings, which were significantly lower than those for collaboration with radiation oncologists and radiation therapists. However, the collaboration-with-nurses’ ratings were significantly higher than those with social workers, dietitians, or spiritual-support personnel (p < .001). The ratings for radiation oncologists did not significantly differ from those for radiation therapists. Participants’ collaboration with nurses received the second highest ratings, which were significantly lower than those for collaboration with radiation oncologists and radiation therapists. However, the collaboration-with-nurses’ ratings were significantly higher than those with social workers, dietitians, or spiritual-support personnel (p < .001).

The much lower sum of ratings for patient collaboration with social workers, dietitians, and spiritual support personnel (ranged 2.60 to 3.16 out of 35) were explored further. Frequency analysis revealed that low ratings were due to a high percentage of respondents (85.4 - 88.9%) reporting “not applicable” (Likert-scale rating of “0”) when they were asked about interactions with these provider groups (Table 3). The means of “not applicable” responses differed from those for “never” or “seldom” responses (ratings of “1” and “2”).

Lastly, the one-way ANOVA for collaboration patterns of patients with different levels of symptom distress showed significant differences. Although patients with lower levels of symptom distress reported lower levels of collaboration (Table 3), this difference was observed only for collaboration with social workers (p < .05) and dietitians (p < .05).

**DISCUSSION**

Results from our study indicate that a) cancer patients collaborated at moderately high levels with their radiation oncologists, radiation therapists, and nurses, and b) the level of patient-provider collaboration with some professionals (i.e., social workers and dietitians) varied by the level of symptom distress.

No known studies examine the nature or magnitude of patient-provider collaboration in RT, and so this study illuminates this important aspect of cancer care. Because of the dearth of literature in this particular area, we compared our results with literature on patient-provider relationships of which collaboration is a key subconcept (see introduction). A handful of studies focus on patient-provider relationships in cancer care (e.g., Sheppard et al., 2013; Torbit et al., 2016; Underhill & Kiviniemi, 2012). Only one study focused on cancer patients receiving RT: Famiglietti and colleagues (2013) surveyed more than 8,000 patients and reported that patient-provider relationship was positively associated with overall satisfaction about care during RT.

<table>
<thead>
<tr>
<th>Instrument item</th>
<th>Physicians</th>
<th>Nurses</th>
<th>Radiation therapists</th>
<th>Social workers</th>
<th>Dietitians</th>
<th>Spiritual support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent Comm.</td>
<td>3.92 (0.74)</td>
<td>2.96 (1.48)</td>
<td>4.41 (0.98)</td>
<td>0.88 (0.91)</td>
<td>0.88 (0.80)</td>
<td>0.81 (0.75)</td>
</tr>
<tr>
<td>Timely Comm.</td>
<td>4.67 (0.69)</td>
<td>3.07 (2.03)</td>
<td>4.44 (1.17)</td>
<td>0.57 (1.18)</td>
<td>0.44 (0.94)</td>
<td>0.31 (0.73)</td>
</tr>
<tr>
<td>Accurate Comm.</td>
<td>4.76 (0.60)</td>
<td>3.10 (2.15)</td>
<td>4.59 (1.04)</td>
<td>0.51 (1.24)</td>
<td>0.53 (1.23)</td>
<td>0.23 (0.80)</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>3.55 (2.10)</td>
<td>2.36 (2.25)</td>
<td>3.44 (2.10)</td>
<td>0.39 (1.12)</td>
<td>0.40 (1.12)</td>
<td>0.18 (0.64)</td>
</tr>
<tr>
<td>Shared Knowledge</td>
<td>3.34 (1.10)</td>
<td>2.54 (1.47)</td>
<td>3.14 (1.23)</td>
<td>0.84 (1.24)</td>
<td>0.82 (1.22)</td>
<td>0.56 (1.00)</td>
</tr>
<tr>
<td>Mutual Respect</td>
<td>4.82 (0.56)</td>
<td>3.64 (2.08)</td>
<td>4.67 (1.05)</td>
<td>0.54 (1.46)</td>
<td>0.50 (1.39)</td>
<td>0.20 (0.85)</td>
</tr>
<tr>
<td>Shared Goals</td>
<td>4.44 (1.17)</td>
<td>3.37 (2.13)</td>
<td>4.32 (1.38)</td>
<td>0.43 (1.28)</td>
<td>0.47 (1.32)</td>
<td>0.25 (0.96)</td>
</tr>
<tr>
<td>Sum of items</td>
<td>29.79 (3.74)</td>
<td>21.44 (10.92)</td>
<td>29.15 (6.56)</td>
<td>4.19 (7.21)</td>
<td>4.06 (7.13)</td>
<td>2.51 (4.54)</td>
</tr>
<tr>
<td>Sum of items</td>
<td>29.73 (4.02)</td>
<td>21.82 (10.73)</td>
<td>28.65 (7.88)</td>
<td>3.16 (6.31)</td>
<td>3.01 (6.43)</td>
<td>2.60 (5.35)</td>
</tr>
<tr>
<td>Sum of items</td>
<td>29.89 (3.23)</td>
<td>20.77 (11.35)</td>
<td>30.02 (2.93)</td>
<td>6.09 (8.86)</td>
<td>5.93 (7.97)</td>
<td>2.36 (2.58)</td>
</tr>
</tbody>
</table>

Notes. *Range 1-5, higher = more collaborative. ’Mean. **Standard deviation. †Range 0-35, higher = more collaboration. ’p < .001. ’p < .05.
Although the authors did not collect specific information about patient-provider relationships by professional group, in their study perceived experiences with nursing staff, radiation therapists, and radiation oncologists correlated positively with overall satisfaction about care ($r$ ranged from .60 to .70). Their results coincided well with ours in that these three professional groups received the highest ratings from patients for being collaborative. The two studies’ similar magnitude of association reflects the importance of these three professional roles during RT.

Although our results showed moderate to high levels of collaboration with three groups of professionals, our results did not provide specific information on how patients collaborated with them. In examining the literature on supportive-care needs associated with cancer, we identified several categories of need: information, spiritual, emotional, and financial (Smith, Hyde, & Stanford, 2015). It appears that these needs are closely connected with self-management of (a) medical aspects of illness, (b) life roles or changes in roles brought on by illness, and (c) psychological consequences of chronic illness (Lorig & Holman, 2003). In our study, higher collaboration reported with radiation oncologists, therapists, and nurses suggests that these professionals engaged RT patients in tackling the aforementioned issues.

We postulated that certain professional groups are more involved in addressing relevant patient needs. This led to our next key result: the low levels of collaboration with social workers, dietitians, and spiritual-support personnel. We felt that the low levels of collaboration might relate to low self-management needs of patients who are well. Indeed, we noted significantly lower levels of collaboration among participants with extremely low ESAS scores (sum ≤ 11), but only with social workers and dietitians (Table 3), which had close to seven times lower scores than physicians, radiation therapists and nurses (Table 3). We confirmed this result through frequency analysis, which showed that many participants did not interact with three groups of professionals during RT. We postulated that this lack of interaction related to the disease sites and related symptoms within our sample; for example, breast and prostate irradiation are less likely to cause severe radiotoxicities (Haas, 2010). Thus, patients with mild symptoms may be less likely to seek social and spiritual support. Also, without difficulty with food intake or maintaining desirable weights, patients may not interact with nutritionists (Piderman et al., 2014). In our study, patients receiving treatment in the prostate or breasts were unlikely to have dysphagia, which is the key reason for inserting feeding tubes during RT. Therefore, in our study, since most participants were being treated for breast or prostate cancer, they would have less need to collaborate with dietitians. Conversely, among patients with higher needs, particularly those with high levels of symptom distress, collaboration with dietitians, social workers and spiritual-support personnel may be more important. This issue is worthy of further exploration.

We were unable to locate other studies of interactions between RT patients and social workers, dietitians, spiritual-support personnel. Among the few relevant studies Piderman et al. (2014) reported positive impact of a longitudinal, quality-of-life intervention on spiritual quality of life, but did not provide information about the prevalence of interaction between cancer patients and spiritual-support staff. Hazzard et al. (2018) systematically reviewed studies of nutrition-related hospital visits by RT outpatients and reported difficulties in determining the prevalence of unplanned contacts. Similarly, we could not locate literature that documents the prevalence of collaboration between social workers and RT patients, despite recent guidelines on the topic (Pirl et al., 2014). While it seems intuitive that patients will not interact with all allied health professionals unless pertinent issues arise, there are important preventive interventions performed by allied health professionals that lead to superior cancer treatment outcomes. For instance, diet and weight loss counselling facilitated by dietitians led to favourable inflammatory marker level in a group of breast cancer patients undergoing cancer treatment (Harrigan et al., 2016). Smoking cessation intervention (which can be done by nurses, physicians and social workers) was associated with improved outcomes in patients with prostate cancer who received radiation therapy (Hamdy et al., 2016).

**LIMITATIONS**

Our study has a few limitations. First, the use of a convenience sample comprising well-functioning patients with mainly breast and prostate cancer at one cancer centre may
limit the applicability of our results to patients with other cancers. Second, the use of self-report measures in assessing collaboration confounded our understanding to only the patient perspective. Collaborative behaviour could be assessed more comprehensively through direct observation. Third, our survey did not provide information on phenomena that cannot be meaningfully expressed by numbers, such as patients’ emotions associated with interacting with providers and hierarchies within health care organizations. However, our quantitative approach reached more patients and provided information about collaboration pattern that can facilitate comparison with future studies.

**FUTURE DIRECTIONS**

The present study is the first that we know of to provide information regarding patients’ perceptions of their collaboration with all professionals in a radiation oncology department. Our results support the key roles played during RT by radiation oncologists, radiation therapists, and nurses. In contrast to existing studies that focused on indirect measures of collaboration, such as perceived trust, satisfaction, and accessibility (Mattingly, Tom, Stuart, & Onukwugha, 2017; Sheppard et al., 2013; Vowles & Thompson, 2012), our measure of relational coordination directly assessed behaviours and attitudes that indicated collaboration. Because cancer treatment has become increasingly nuanced, modality-specific information obtained from the instrument developed for this study will be used to guide future research.

There are a number of possible future directions. Based on the paucity of literature and inconsistent methods for measuring patient-provider collaboration, it is important to continue investigating patient-provider collaboration during RT with a theoretically informed approach, which allows for consistency and precision in assessing the concept. An appropriate starting point would be qualitative research to map out the attributes, antecedents, and outcomes of patient-provider collaboration in RT. One potential outcome of patient-provider collaboration is improved quality of care (Lee & Doran, 2017) and empirical support for this important outcome has yet to be confirmed.

**REFERENCES**


Hazzard, E., Walton, K., McMahon, A.T., Milosavljevic, M., & Tapsell, L.C. (2018). Nutrition-related hospital presentations results from our study also suggest that radiation oncologists, radiation therapists, and nurses may have provided more relevant support to patients during RT. Yet, to achieve synergy, collaboration with patients should be promoted by the entire patient-care team. Literature on interprofessional practice spells out clear domains of collaboration among providers, but guidelines have yet to be published for patient-provider collaboration in interprofessional settings. For instance, patient education in an interprofessional model of care may take into account the three areas of self-management described above. Such integration would provide structure and consistency to patient-provider collaboration throughout the cancer trajectory.

Another way to enhance patient-provider collaboration in interprofessional settings would be to increase the consistent use of supportive-care resources by professionals from different disciplines. For instance, the Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) guideline is currently being tested for use by radiation therapists (Stacey & Jolicoeur, 2017). Further research should evaluate the impact of a consistent symptom-support approach on facilitating patient collaboration with all clinicians. As treatment modality advances and becomes more distinct in its individual mechanism of action, there needs to be further inquiries to address modality-specific challenges to be tackled by the interprofessional cancer care team.

**CONCLUSION**

Our study sheds light on patterns of patient-provider collaboration in radiation oncology and will guide future research in supporting patient-provider alliances. Based on the study results, we conclude that patient-provider collaboration is context specific; that is, the extent in which patients work with their health care providers may depend on their specific symptoms and self-care needs. Future investigations and applications, such as on the topic of team-based adoption of knowledge-informed practice to ensure consistency in approach, will build collaborative relationships between patients and clinicians.


