



Delivery of cancer care via an outpatient telephone support line: a cross-sectional study of oncology nursing perspectives on quality and challenges

Hely Shah¹ · Lisa Vandermeer² · Fiona MacDonald³ · Gail Larocque^{1,3} · Shannon Nelson¹ · Mark Clemons^{2,4,5} · Sharon F. McGee^{1,4,5}

Received: 20 February 2022 / Accepted: 9 August 2022 / Published online: 18 August 2022
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Abstract

Rationale Patient support lines (PSLs) assist in triaging clinical problems, addressing patient queries, and navigating a complex multi-disciplinary oncology team. While providing support and training to the nursing staff who operate these lines is key, there is limited data on their experience and feedback.

Methods We conducted a cross-sectional study of oncology nurses' (ONs') perspectives on the provision of care via PSLs at a tertiary referral cancer center via an anonymous, descriptive survey. Measures collected included nursing and patient characteristics, nature of questions addressed, perceived patient and nursing satisfaction with the service, common challenges faced, and initiatives to improve the patient and nursing experience. The survey was delivered online, with electronic data collection, and analysis is reported descriptively.

Results Seventy-one percent (30/42) of eligible ONs responded to the survey. The most common disease site, stage, and symptom addressed by PSLs were breast cancer, metastatic disease, and pain, respectively. The most common reported issue was treatment-related toxicity (96.7%, 29/30). Sixty-seven percent (20/30) of respondents were satisfied with the care provided by the service; however, many areas for potential improvement were identified. Fifty-nine percent (17/29) of respondents recommended redefining PSLs' responsibilities for improved use, with 75% (6/8) ONs identifying high call volumes due to inappropriate questions as a barrier to care. Sixty percent (18/30) of ONs reported having hospital-specific management plans for common issues would improve the care provided by the PSL.

Conclusion Despite high rates of satisfaction with the care provided by the PSL, our study identified several important areas for improvement which we feel warrant further investigation.

Keywords Oncology nursing · Telephone · Healthcare survey · Oncology service hospital

Introduction

Since their establishment in 1975, patient support lines have been a valuable resource in answering and triaging non-urgent patient medical queries and providing emotional support as patients and caregivers navigate life-changing diagnoses and interact with a complex multi-disciplinary oncology team [1]. Patients have reported on the positive impact of access to familiar nursing staff and expedited follow-up with oncologists facilitated by support lines [2]. As such, it is important to provide the nursing staff that operate these lines with ongoing support and training.

Literature examining methods to improve nursing and patient experience on cancer helplines and to ensure appropriate quality control was published as early as the 1980s

✉ Sharon F. McGee
shmgee@toh.ca

¹ The Ottawa Hospital Cancer Center, Ottawa, ON, Canada

² Centre for Cancer Therapeutics, Ottawa Hospital Research Institute, Ottawa, ON, Canada

³ Department of Nursing, The Ottawa Hospital, Ottawa, ON, Canada

⁴ Division of Medical Oncology, Department of Medicine, The Ottawa Hospital, 501 Smyth Road, Ottawa, ON K1H 8L6, Canada

⁵ University of Ottawa, Ottawa, ON, Canada

[3]. This helped guide research on a stress-coping model to emotionally support patients through new cancer diagnoses or complications thereof [3]. Since then, several studies have detailed patient experience on support lines, the psychosocial impact of support lines and most effective communication methods [1, 4, 5]. As such, several guidelines have been developed to standardize nursing management via patient support lines or cancer helplines, including those from the College of Nurses of Ontario (CNO), Canadian Association of Nurses in Oncology (CANO), and Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) project [6–8].

The Ottawa Hospital Cancer Centre (TOHCC) is an academic tertiary center providing access to specialized cancer care and clinical trials. TOHCC serves a population of approximately 1.5 million patients in Eastern Ontario, Canada, with over 25,000 visits per year [9]. The center provides care via two telephone support lines, the TOHCC patient support line (PSL) and the Wellness Beyond Cancer PSL. The TOHCC PSL was established in 2015 to assist patients with questions regarding active cancer care. It operates Monday to Friday, from 9 am to 4 pm, with the recent introduction of an after-hours and weekend service provided through a provincial nursing service (CAREchart@home). The volume of calls received by the PSL increased significantly during the pandemic, from an average of 3600 to 5200 per month. The Wellness Beyond Cancer PSL was established in 2012 to address concerns related to patients who have been discharged from the cancer center following the completion of their cancer treatment. It is available from 8 am to 4 pm, Monday to Friday [9]. Both PSLs are supported by a cohort of oncology nurses (ONs, $n = 42$), clerical staff, and administrative support (clinical care leader and clinical manager). One of the guidelines used by ONs who operate PSLs is the Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) practice guides, which were adapted to The Ottawa Hospital Cancer Centre in 2016 [10].

Since the onset of the COVID-19 pandemic in December 2019, there has been a rapid shift to virtual care and increased demand for telehealth services, one of which is patient support lines [11–13]. This change, in concurrence to prior literature, has highlighted the importance of providing the nursing staff operating these helplines with adequate knowledge, support, and confidence to assess and triage patients' medical and emotional concerns [14]. However, there is limited, current, data on oncology nurses' experience and feedback on ongoing improvement strategies of patient support lines [15, 16].

In the current study, we surveyed oncology nurses (ONs) who deliver care via TOHCC and WBCP PSLs for their perspective on the quality and efficacy of care delivered via

the support lines, the nature of questions asked, and issues addressed, as well as challenges faced. This data will be used to identify key areas for improvement to optimize patient and nursing experience, and the quality of care delivered by the service.

Methods

Study population

All oncology nurses (ONs) providing care via TOHCC and WBCP PSLs were included in this cross-sectional study, for a sample size of 42, with a target participation rate of 80%.

Study outcomes

The primary outcomes of the study were to learn about nurses' experience on PSLs. In addition, we wanted to identify areas for improvement to optimize the quality of care and patient and nursing satisfaction with the service.

Survey development

The survey was developed by healthcare providers (HCPs) and researchers at the TOHCC with experience in questionnaire development and the provision of care via the PSL. It followed the structure provided by the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) outlined by Eysenbach [17] as reported in Table 1. We conducted preliminary screens within the research group and with oncology nurses to ensure the survey was functional and to eliminate any technical limitations. An introductory section explained the purpose of the survey and indicated that completion implied consent to participate. The first section of the survey consisted of 5 closed questions that confirmed eligibility and collected demographic information including years worked as an ON, years of experience providing care via TOHCC support lines, and number of days per week spent providing care on the PSL. The second section included 4 closed questions that collected data on the most common disease sites and stage encountered, and the nature of questions addressed by the service, including high-level issues and specific symptoms managed. The third section included 12 closed and 4 open questions that sought nurses' perceptions on the quality and efficacy of care provided by TOHCC PSLs and barriers to providing the desired standard of care. Finally, nurses' insights on potential strategies to improve the quality of care provided by the support line were explored. Thus, in total there were 21 closed questions

Table 1 Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [17]

Checklist item	Explanation	Page number
Describe survey design	Describe target population, sample frame. Is the sample a convenience sample? (In “open” surveys this is most likely)	8
IRB approval	Mention whether the study has been approved by an IRB	10
Informed consent	Describe the informed consent process. Where were the participants told the length of time of the survey, which data were stored and where and for how long, who the investigator was, and the purpose of the study?	9
Data protection	If any personal information was collected or stored, describe what mechanisms were used to protect unauthorized access	9, 10
Development and testing	State how the survey was developed, including whether the usability and technical functionality of the electronic questionnaire had been tested before fielding the questionnaire	8, 9
Open survey versus closed survey	An “open survey” is a survey open for each visitor of a site, while a closed survey is only open to a sample which the investigator knows (password-protected survey)	9
Contact mode	Indicate whether or not the initial contact with the potential participants was made on the Internet. (Investigators may also send out questionnaires by mail and allow for Web-based data entry.)	9
Advertising the survey	How/where was the survey announced or advertised? Some examples are offline media (newspapers), or online (mailing lists—If yes, which ones?) or banner ads (Where were these banner ads posted and what did they look like?). It is important to know the wording of the announcement as it will heavily influence who chooses to participate. Ideally the survey announcement should be published as an appendix	9
Web/E-mail	State the type of e-survey (e.g., one posted on a Web site, or one sent out through e-mail). If it is an e-mail survey, were the responses entered manually into a database, or was there an automatic method for capturing responses?	9
Context	Describe the Web site (for mailing list/newsgroup) in which the survey was posted. What is the Web site about, who is visiting it, what are visitors normally looking for? Discuss to what degree the content of the Web site could pre-select the sample or influence the results. For example, a survey about vaccination on an anti-immunization Web site will have different results from a Web survey conducted on a government Web site	9
Mandatory/voluntary	Was it a mandatory survey to be filled in by every visitor who wanted to enter the Web site, or was it a voluntary survey?	9
Incentives	Were any incentives offered (e.g., monetary, prizes, or non-monetary incentives such as an offer to provide the survey results)?	9
Time/Date	In what timeframe were the data collected?	9
Randomization of items or questionnaires	To prevent biases items can be randomized or alternated	Not done
Adaptive questioning	Use adaptive questioning (certain items, or only conditionally displayed based on responses to other items) to reduce number and complexity of the questions	Not done
Number of Items	What was the number of questionnaire items per page? The number of items is an important factor for the completion rate	8, 9

Table 1 (continued)

Checklist item	Explanation	Page number
Number of screens (pages)	Over how many pages was the questionnaire distributed? The number of items is an important factor for the completion rate	9
Completeness check	It is technically possible to do consistency or completeness checks before the questionnaire is submitted. Was this done, and if “yes”, how (usually JavaScript)? An alternative is to check for completeness after the questionnaire has been submitted (and highlight mandatory items). If this has been done, it should be reported. All items should provide a non-response option such as “not applicable” or “rather not say”, and selection of one response option should be enforced	Not done
Review step	State whether respondents were able to review and change their answers (e.g., through a Back button or a Review step which displays a summary of the responses and asks the respondents if they are correct)	Not applicable
Unique site visitor	If you provide view rates or participation rates, you need to define how you determined a unique visitor. There are different techniques available, based on IP addresses or cookies or both	10
View rate (ratio of unique survey visitors/unique site visitors)	Requires counting unique visitors to the first page of the survey, divided by the number of unique site visitors (not page views!). It is not unusual to have view rates of less than 0.1% if the survey is voluntary	10
Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	Count the unique number of people who filled in the first survey page (or agreed to participate, for example by checking a checkbox), divided by visitors who visit the first page of the survey (or the informed consents page, if present). This can also be called “recruitment” rate	10
Completion rate (Ratio of users who finished the survey/users who agreed to participate)	The number of people submitting the last questionnaire page, divided by the number of people who agreed to participate (or submitted the first survey page). This is only relevant if there is a separate “informed consent” page or if the survey goes over several pages. This is a measure for attrition. Note that “completion” can involve leaving questionnaire items blank. This is not a measure for how completely questionnaires were filled in. (If you need a measure for this, use the word “completeness rate”)	10
Cookies used	Indicate whether cookies were used to assign a unique user identifier to each client computer. If so, mention the page on which the cookie was set and read, and how long the cookie was valid. Were duplicate entries avoided by preventing users’ access to the survey twice; or were duplicate database entries having the same user ID eliminated before analysis? In the latter case, which entries were kept for analysis (e.g., the first entry or the most recent)?	No cookies assigned
IP check	Indicate whether the IP address of the client computer was used to identify potential duplicate entries from the same user. If so, mention the period of time for which no two entries from the same IP address were allowed (e.g., 24 h). Were duplicate entries avoided by preventing users with the same IP address access to the survey twice; or were duplicate database entries having the same IP address within a given period of time eliminated before analysis? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?	No IP check
Log file analysis	Indicate whether other techniques to analyze the log file for identification of multiple entries were used. If so, please describe	Not done

Table 1 (continued)

Checklist item	Explanation	Page number
Registration	In “closed” (non-open) surveys, users need to login first and it is easier to prevent duplicate entries from the same user. Describe how this was done. For example, was the survey never displayed a second time once the user had filled it in, or was the username stored together with the survey results and later eliminated? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?	Not done
Handling of incomplete questionnaires	Were only completed questionnaires analyzed? Were questionnaires which terminated early (where, for example, users did not go through all questionnaire pages) also analyzed?	10
Questionnaires submitted with an atypical timestamp	Some investigators may measure the time people needed to fill in a questionnaire and exclude questionnaires that were submitted too soon. Specify the timeframe that was used as a cut-off point, and describe how this point was determined	Not done
Statistical correction	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for the non-representative sample; if so, please describe the methods	Not done

and 4 open questions. The entire survey was presented on one screen.

Survey implementation

This was a closed descriptive survey where nurses providing care via PSLs were invited to voluntarily participate in an online survey via an email from the clinical manager of the TOHCC Clinics and Wellness Beyond Cancer Program (SN). No incentives were offered for completion of survey. The email contained a hyperlink to the electronic survey on Microsoft® Forms and an information sheet regarding the study. The Microsoft® Forms software collected, stored, and aggregated the data into a Microsoft® Excel sheet that was used for analysis. Both software programs were accessed from the hospital’s Microsoft® OneDrive to ensure data was collected and stored securely. A reminder email with the electronic survey link was sent 4 weeks later to increase participation [18, 19]. The survey was conducted between September 9, 2021, and October 8, 2021, with the reminder email sent on October 4, 2021. The survey was completed anonymously, and no personal identifiers were collected. Completion of survey was indicative of consent for analysis and publication. We did not offer completeness checks, non-response options for some of the questions, or a review step as a part of the survey. As we required completion of survey to indicate consent, we cannot offer participation or completion rates. The

study and survey were approved by the Ottawa Hospital Science Network Research Ethics Board (OHSN-REB) on August 17, 2021.

Data collection and analysis

Responses were stored in a password-protected database accessible to the study team only. Data was further managed on an Excel spreadsheet and saved to a secure server at the Ottawa Hospital. Statistical analysis was completed by study staff and data will be reported descriptively. Planned analysis for open-ended questions was to present data ad verbatim as shown in the “Supplementary information” and summarized descriptively in the manuscript. No statistical correction was performed. We included all surveys that were submitted, even if respondents did not complete all questions.

Results

Participant demographics

The response rate was 71.4%, with 30 of the 42 eligible nursing staff completing the survey. Sixty-three percent (19/30) of nurses had worked as an oncology nurse for greater than 10 years. Forty-three percent (13/30) of nurses had provided care on TOHCC PSLs for less than 5 years, 37% (11/30) for

Table 2 Demographic information of nursing respondents

Survey questions	Number of responses	Choice (number, percentage)
Number of years worked as an oncology nurse	30	1. < 5 years (2, 6.7%) 2. 5–10 years (9, 30.0%) 3. > 10 years (19, 63.3%)
Number of years providing care via TOHCC patient support lines	30	1. < 5 years (13, 43.3%) 2. 5–10 years (11, 36.7%) 3. > 10 years (6, 20.0%)
Number of days per week spent providing care on TOHCC patient support lines	30	1. 1 day (25, 83.3%) 2. 2 days (4, 13.3%) 3. 3 days (0, 0.0%) 4. 4 days (0, 0.0%) 5. 5 days (1, 3.3%)

5–10 years, and 20% (6/30) for greater than 10 years. The majority (83%, 25/30) provided care via the PSL at least one day per week (Table 2).

Characteristics of support line users and calls

From nurses' experience, the most common disease sites contacting the TOHCC PSLs are breast (60%, 18/30) and gastrointestinal cancers (40%, 12/30). When asked to rank the most common disease stage of patients using the service, 70.8% (17/24) ranked metastatic disease as the most common, followed by patients receiving adjuvant treatment for early-stage disease. Participants identified the 5 most common issues dealt with by the support line as toxicities of chemotherapy (96.7%, 29/30), requests for prescription refills or questions about drug coverage (83.3%, 25/30), cancer symptoms (66.7%, 20/30), abnormal test results (60%, 18/30), and questions about booking information (43.3%, 13/30). The 5 most common cancer- and treatment-related symptoms addressed by the PSL were identified as pain (96.7%, 29/30), nausea/vomiting (90%, 27/30), constipation/diarrhea (86.7%, 26/30), shortness of breath (70%, 21/30), and fever (30%, 9/30). Further details on questions and symptoms addressed on TOHCC PSL are detailed in Table 3.

Nursing experience on the support line

Results showed that 67% of nurses were satisfied (agree 15/30, strongly agree 5/30) with the quality and efficacy of the care they provided via TOHCC PSLs. However, 33.3% were either neutral (5/30) or expressed dissatisfaction (disagree 5/30, strongly disagree 0/30) with care provided. Patients were perceived to be satisfied with the care they received via TOHCC PSLs by 70% of nurses (agree 17/30, strongly agree 4/30), with 23.3% (7/30) being neutral and only 6.7% of nurses feeling patients were dissatisfied with the care provided (Table 4). Of the

8 nurses detailing the reason for patients' and/or nursing dissatisfaction, high call volumes were reported to be a leading cause by 6 nurses, as it decreased the time allocated for providing support to patients and their caregivers, appropriately answering patient queries, and preventing emergency department visits. A lack of support from either management of physicians was cited by 3 nurses as a factor reducing nursing ability to answer patient queries. The frequent closure of an outpatient unit where patients could be quickly assessed by a physician was identified as a barrier to providing satisfactory care by 2 nurses, as patients then needed to be referred to the emergency department for minor issues. Finally, 1 nurse recommended that nursing staff scheduled to operate the support line on a given day have experience across different disease sites, to ensure a broader range of expertise was available to address patient needs.

While majority of nurses agreed that the PSL was appropriately used by physicians (73%, agree 19/30, strongly agree 3/30), fewer felt that patients used the service appropriately (39.7%, agree 11/30, strongly agree 1/30) (Table 4). The top 5 appropriate uses of TOHCC PSL as per respondents were management of urgent treatment-related toxicity (96.7%, 29/30), management of cancer-related symptoms (96.7%, 29/30), and management of urgent test results, or those guiding cancer treatment (70%, 21/30), provision of emotional support (43% 13/30) and addressing medication queries (30%, 9/30). Additional responses are detailed in Table 4.

The survey found that 80% (24/30) of nurses did not feel that there was a decreased volume of calls to the PSL when patients were provided with greater access to their electronic medical record (EMR), including immediate release of test results (Table 4). Of note, all respondents noted increased anxiety and stress related to test results that were often viewed prior to appointment times leading to increased volume of calls requesting explanation of results, earlier appointments, or to speak with their

Table 3 Characteristics of support line calls as reported by nursing respondents

Survey questions	Number of responses	Rank list (number, percentage)
“From your experience, please rank the disease stage that contacts the support line most frequently”	24	<p>As first choice:</p> <ol style="list-style-type: none"> 1. Metastatic patients (17, 70.8%) 2. Adjuvant patients (6, 25%) 3. Wellness/discharge patients (1, 4.2%) <p>As second choice:</p> <ol style="list-style-type: none"> 1. Metastatic patients (5, 20.8%) 2. Adjuvant patients (17, 70.8%) 3. Wellness/discharge patients (2, 8.3%) <p>As last choice:</p> <ol style="list-style-type: none"> 1. Metastatic patients (2, 8.3%) 2. Adjuvant patients (1, 4.2%) 3. Wellness/discharge patients (21, 87.5%)
“From your experience, please rank the disease sites that contact the support line most frequently”	30	<p>As first choice:</p> <ol style="list-style-type: none"> 1. Breast (18, 60.0%) 2. Gastrointestinal (12, 40.0%) <p>As second choice:</p> <ol style="list-style-type: none"> 1. Gastrointestinal (16, 53.3%) 2. Breast (8, 26.7%) 3. Lung (3, 10.0%) 4. Genitourinary (3, 10.0%) <p>As third choice:</p> <ol style="list-style-type: none"> 1. Lung (15, 50.0%) 2. Genitourinary (9, 30.0%) 3. Breast (4, 13.3%) 4. Gastrointestinal (2, 6.7%) <p>As last choice:</p> <ol style="list-style-type: none"> 1. Genitourinary (18, 60.0%) 2. Lung (12, 40.0%)
“Please select the 5 most common types of calls dealt with on the support line.”	30	<ol style="list-style-type: none"> 1. Toxicities of chemotherapy (29, 96.7%) 2. Requests for prescription refills or questions about drug coverage (25, 83.3%) 3. Poorly controlled or new cancer symptoms (20, 66.7%) 4. Treatment or cancer related abnormal test result (18, 60.0%) 5. Questions about booking information (13, 43.3%) 6. Toxicities of immunotherapy (12, 40.0%) 7. Emotional/ psychological support (9, 30.0%) 8. Questions about what MD discussed (8, 26.7%) 9. Toxicities of endocrine therapy (6, 20%) 10. Inadequate social/home supports (6, 20.0%) 11. Other (4, 13.3%) 12. Problems following discharge through the Wellness Program (1, 3.3%)
“From your experience, please select the 5 most common symptoms dealt with by the support line.”	30	<ol style="list-style-type: none"> 1. Pain (29, 96.7%) 2. Nausea/Vomiting (27, 90.0%) 3. Constipation/Diarrhea (26, 86.7%) 4. Shortness of breath (21, 70.0%) 5. Fever (9, 30.0%) 6. Rash (9, 30.0%) 7. Swollen extremity (8, 26.7%) 8. Mucositis (7, 23.3%) 9. New lump/skin lesion (5, 16.7%) 10. Other (3, 10.0%) 11. Chemotherapy-related neuropathy (1, 3.3%) 12. PICC/PORT problems (0, 0.0%)

Table 4 Respondents experience on PSL including quality of care and appropriate use

Survey questions	Number of responses	Rank list (number, percentage)
“I feel that overall patients are happy with the service provided by the support line”	30	<ol style="list-style-type: none"> 1. Strongly agree (4, 13.3%) 2. Agree (17, 56.7%) 3. Neutral (7, 23.3%) 4. Disagree (2, 6.7%) 5. Strongly disagree (0, 0.0%)
“I am satisfied with the quality and efficacy of the care I am able to provide patients via the support line”	30	<ol style="list-style-type: none"> 1. Strongly agree (5, 16.7%) 2. Agree (15, 50.0%) 3. Neutral (5, 16.7%) 4. Disagree (5, 16.7%) 5. Strongly disagree (0, 0.0%)
Reasons for dissatisfaction with care provided via the support line	8	<ol style="list-style-type: none"> 1. Limited psychosocial support (2, 25.0%) 2. Time constraints/ high call volumes (5, 62.5%) 3. Inappropriate questions asked (2, 25.0%) 4. Having emergency room as the only triage/assessment option (3, 37.5%) 5. Not having patient designated nurses or varied disease site nurses at a given time (1, 12.5%)
“The service provided by the support line is appropriately used by patients”	30	<ol style="list-style-type: none"> 1. Strongly agree (1, 3.3%) 2. Agree (11, 36.7%) 3. Neutral (10, 33.3%) 4. Disagree (7, 23.3%) 5. Strongly disagree (1, 3.3%)
“The service provided by the support line is appropriately used by physicians”	30	<ol style="list-style-type: none"> 1. Strongly agree (3, 10.0%) 2. Agree (19, 63.3%) 3. Neutral (5, 16.7%) 4. Disagree (2, 6.7%) 5. Strongly disagree (1, 3.3%)
“Please select up to 5 [most appropriate uses of support line]”	30	<ol style="list-style-type: none"> 1. Management of urgent treatment related toxicity (29, 96.7%) 2. Management of cancer related symptoms (29, 96.7%) 3. Management of urgent/ critical test results (21, 70.0%) 4. Provision of emotional/psychological support (13, 43.3%) 5. Addressing medication related queries (9, 30.0%) 6. Answering general questions about non-urgent test results, appointment times, things discussed by MD in clinic (9, 30.0%) 7. Any patient issue is appropriate for management by the support line (2, 6.7%) 8. Addressing issues of patients who have been discharged from the cancer center, e.g., Wellness patients (1, 3.3%) 9. Other (1, 3.3%)
“Patients having greater/quicker access to their personal health information (clinic notes, test results) via MyChart will reduce the demands on the support line”	30	<ol style="list-style-type: none"> 1. Yes (2, 6.7%) 2. No (24, 80.0%) 3. I don't know (4, 13.3%)

oncologist sooner. Only 2 nurses felt that increased patient access to their EMR had improved the volume of calls due to patients learning the treatment plan from physician progress notes or answering their questions via chart review.

Insights on strategies to improve care

The barriers to care identified by TOHCC PSL nurses are detailed in Table 4, with the primary reason cited as high volume of inappropriate/non-urgent calls making it challenging to deal with acute issues (80%, 24/30). As such,

58.6% (17/29) nurses reported a need to redefine the goals and responsibilities of the support line to ensure appropriate use of the PSL by patients and physicians.

An alternative strategy to improve care investigated in the survey was the utility of consensus guidelines in addressing patient queries on the PSL. The majority of nurses agreed that TOHCC specific, consensus guidelines, for the management of common patient issues and symptoms such as treatment related toxicity and pain, respectively, would improve the efficacy and quality of care provided (60%, 18/30), and nursing experience (56.7%, 17/30) on the PSL. However,

36.7% nurses were unsure of their utility. To help develop these guidelines, nurses reported experience with similar established guidelines from the Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) project, (33.3%, 10/30), Cancer Care Ontario (CCO) (20%, 6/30), and Cancer Association of Nurses in Ontario (CANO) (3.3%, 1/30) [7, 8, 20].

Nurses were asked to rank 4 other potential interventions to improve the delivery of care via TOHCC PSLs. The intervention ranked first by majority of respondents was, “identifying issues that do not need nursing input that could be delegated to another service for management” (33%, 8/24). Of 24 respondents, 6 ONs identified the “introduction of medical directives to give nurses greater power/autonomy in patient care as appropriate” as their most important initiative. Finally, “having a TOHCC Frequently Asked Questions webpage/document to refer patients to for simple/common issues” and “having a single contact number for the cancer center to reduce duplication of calls/work” were

each identified by 20% of respondents (5/24) respectively, as the most important initiative to improve care via the PSL. Details of second and later choices are reported in Table 5.

Alternative potential improvement strategies proposed by nursing respondents were increased training for clerks operating PSLs, physician consensus, and patient education in appropriate use of the PSL, increased staff on high volume days, improved quality of TOHCC website, and the introduction of nurse-led clinics to further support patients. The recommendations from nurses are detailed in Table 6.

Discussion

Cancer support lines provide a critical service to patients and caregivers, helping them to navigate complex diagnoses, treatment plans, and healthcare systems, while providing important psychosocial support [1, 21–23]. The TOHCC and WBC PSLs were created with the aim to address these

Table 5 Nurses’ perspectives and recommendations to improve the care provided by the support line

Survey questions	Number of responses	Rank list (number, percentage)
Nurses who recommend redefining the goals/responsibilities of the PSL for more appropriate use of PSL	29	1. Yes (17, 58.6%) 2. No (6, 20.7%) 3. Unsure (6, 20.7%)
“Please choose up to 5 factors that can make providing patient care via the support line challenging”	30	1. High volume of inappropriate/non-urgent calls making it challenging to deal with acute issues (24, 80.0%) 2. Not being able to physically see, and objectively assess, the patient (17, 56.7%) 3. Unclear documentation regarding patient history or care plan (15, 50.0%) 4. Patients contacting multiple sites/numbers for a single issue resulting in duplication of work (15, 50.0%) 5. Lack of clarity/consensus from MDs on how to address common patient issues for all patients (14, 46.7%) 6. Not knowing the patient or clinical situation (14, 46.7%) 7. Inability of nursing to initiate steps in the management of patients in the current system (11, 36.7%) 8. Insufficient training or experience with management of a given disease site or problem (11, 36.7%) 9. Other (7, 23.3%)
“Having a standard/consensus TOHCC approach for the management of common patient issues/symptoms would improve the efficacy and quality of care”	30	1. Yes (18, 60.0%) 2. No (1, 3.3%) 3. Unsure (11, 36.7%)
“Having a standard/consensus TOHCC approach for the management of common patient issues/symptoms would improve [nursing] experience”	30	1. Yes (17, 56.7%) 2. No (2, 6.7%) 3. Unsure (11, 36.7%)
“Guidelines for managing common patient issues/symptoms that [nurses] have used... help develop a standard approach to [patient] care”	30	1. Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) (10, 33.3%) 2. Cancer Care Ontario (CCO) (6, 20.0%) 3. Canadian Association of Nurses in Oncology (CANO) (1, 3.3%) 4. American Society of Clinical Oncology (ASCO) (0, 0.0%) 5. European Society of Medical Oncology (ESMO) (0, 0.0%) 6. I don’t know (5, 16.7%) 7. Other (8, 26.7%)

Table 6 Respondents perspectives on other initiatives to improve patient care and nursing experience on the PSL

Initiatives to improve patient care and nursing experience on patient support line	Number of responses	Rank list (number, percentage)
Introduction of medical directives to give nursing greater power/autonomy in patient care as appropriate, e.g., order basic labs/tests for patients on EPIC, order basic medications, change patient follow up appointments	24	First choice: 6, 25.0% Second choice: 8, 33.3% Third choice: 6, 25.0% Last choice: 4, 16.7%
Having a TOHCC Frequently Asked Questions webpage/document to refer patients to for simple/common issues		First choice: 5, 20.8% Second choice: 3, 12.5% Third choice: 5, 20.8% Last choice: 11, 45.8%
Identifying issues that do not need nursing input that could be delegated to another service for management, e.g., clerical team, psychosocial oncology, drug reimbursement, etc	24	First choice: 8, 33.3% Second choice: 5, 20.8% Third choice: 8, 33.3% Last choice: 3, 12.5%
Having single contact number for the cancer center for all patient issues with subsequent triage to appropriate area (e.g., nursing, booking, reimbursement, PSOP) to reduce duplication of work	24	First choice: 5, 20.8% Second choice: 8, 33.3% Third choice: 5, 20.8% Last choice: 6, 25.0%
Alternative improvement strategies identified	14	1. Avoid redundant services, e.g., voice mail and Carechart@home, two PSL line numbers (3, 21.4%) 2. Discussion of MyChart queries at scheduled appointments (1, 7.1%) 3. Increased training for clerical staff (4, 28.6%) 4. Nurse-led clinics (1, 7.1%) 5. Patient education on PSL indications and not using it as switchboard (4, 28.6%) 6. Functional cancer center website (1, 7.1%) 7. Physician education PSL use and indications (2, 14.3%) 8. Increased nursing staff on high volume days (2, 14.3%) 9. Distinct palliative care support line (1, 7.1%)

areas of patient care. The ongoing COVID-19 pandemic has led to an increased demand for the service, which served as an important way to help immunocompromised cancer patients maintain social distancing and reduce their contact with high-risk clinical environments [24].

There has been much research to date on nursing directed care via PSLs and other telehealth initiatives to manage symptoms in cancer patients. Despite their widespread use, a recent Cochrane systematic review of randomized studies of nursing-led telephone interventions for symptom control in cancer patients could not confirm the effectiveness of these interventions due to a lack of high quality, standardized data, with additional research in the field highlighted as a priority [25]. However, other studies have reported on the benefits of PSLs [26, 27], with additional areas of study including characteristics of calls received [28, 29], best practices for training of care providers [30–32], and patient perspectives on services provided [33, 34]. There is, however, limited data on nursing feedback on their experience and initiatives to improve the service. Furthermore, most of the research was conducted

before the ongoing COVID-19 pandemic, which has seen a significant increase in demand for remote/virtual health-care including PSLs. Our study adds to data on nursing-led PSLs by providing ON perspectives on the delivery of care, particularly during the COVID-19 pandemic.

Overall, nursing and perceived patient satisfaction with TOHCC and WBC PSLs was high. However, several areas for improvement were reported, such as high volume of inappropriate calls and time constraints with each call, with recommendations to consider redefining the responsibilities of the PSL to patients and physicians, identify issues that could be delegated to non-nursing staff and develop TOHCC-specific PSL management guidelines. The knowledge gained from this survey will be used to develop initiatives to improve the care provided by our service and may be applied to cancer support lines in other institutions.

Firstly, it identified the most common disease site, stage, and symptoms addressed by the PSL which would be important areas for ongoing nursing training and education. Interestingly, despite the availability of numerous cancer symptom management guidelines [8, 18,

35, 36], which nurses were familiar with, and the existing integration of COSTaRs in the EPIC EMR system at TOHCC, there was still keen interest in developing hospital specific guides for the management of common issues, to incorporate local practices and needs. Given the significant research directed toward the development of the aforementioned standardized guidelines, we feel this is an important finding warranting further investigation to determine what specific needs nurses feel are not addressed by existing guidelines.

The study also identified other potential parties for education, namely, physicians, patients, and administration, to ensure PSL services are used appropriately and to their maximum potential. Indeed, many nurses supported redefining the goals and responsibilities of the PSL to ensure nurses were dealing with appropriate clinical, rather than clerical or administrative issues. On review of the literature, this has not been commonly addressed as an area for optimization, with previous reviews instead focusing on variability in patient access and comfort with technology to support remote/virtual healthcare, limited telemedicine modalities used, few nursing training opportunities, and funding, as potential areas of optimization [37, 38]. As such, we believe this as an area requiring further research to ensure PSLs have clearly defined goals, with optimal administrative and managerial support and setup.

The COVID-19 pandemic resulted in a rapid shift to remote/virtual care, including telehealth, by all healthcare providers including nurses, directed by clinical practice guidelines, such as ASCO's guide to cancer care delivery during the COVID-19 pandemic [39]. Paterson et al. conducted a literature review examining the role of telehealth during the pandemic across disciplines, reporting increased use of telehealth, support lines, and EMR systems during the pandemic with limitations including lack of physical assessments, poor electronic literacy, and access to smart devices, amongst others [11]. Margolius et al. supported this and reported increased use of PSLs for COVID-19-related concerns, and their importance in providing ongoing rapid and efficient care despite pandemic restrictions [13]. Similarly, Nath et al. reported increased use of inbox messaging and EMRs to contact physicians across different specialties in an ambulatory clinic setting in the context of the pandemic [12]. Interestingly, our nursing respondents did not feel that patients having increased access to their EMR reduced calls to the support line. Rather, it was perceived by nurses as a source of increased calls due to patient stress and anxiety related to the information provided, which often required medical expertise in understanding or interpreting. A review of literature does not however support this claim. While several studies note HCPs' perception of increased patient anxiety and call volumes due to difficulty with data interpretation with increased EMR access among patients, most studies

did not find this to be the case and the call volumes did not change significantly [40–43]. This highlights the need for better education amongst healthcare providers on the benefits of patient EMR access and the development of initiatives to better use medical record systems to support, guide and communicate with patients. This will be increasingly important as the role of virtual care develops and expands during, and beyond the COVID-19 pandemic.

There are however limitations to our data. It is a single-center study, and despite the overall high response rate, there were some incomplete responses that may have limited the perspectives gained. However, in this case, we do not think it would have changed the results, and we have reviewed the questions to help inform future surveys to ensure questions and design are clear to minimize any potential barriers to response. Similarly, some of the questions with "other" as an option could have been followed with an open-ended question or comment section to capture more information. Our question on quality or efficacy did not delineate between the two, but given a broad consistency across responses, we suspect that the ONs interpreted the question accurately. Additionally, we are lacking feedback from patients and physicians regarding their experience of, and expectations for PSLs, which would offer a more comprehensive assessment of the service, and initiatives to improve the care provided. Furthermore, we did not collect data points on age, sex, oncology nursing certification, or level of nursing education, which may have provided additional information on demographics and diversity. Finally, our study would benefit from analyzing our data in combination with variance in call volumes to identify innovative solutions for times when the demand for the service is high, e.g., post weekends or holidays. These areas will however be the focus of future research efforts, as we strive to optimize the potential of this critical patient service.

Conclusion

Despite high rates of ON, and perceived patient satisfaction with the care provided by the PSL, there was a clear need for improvement in several areas, such as high call volumes and time constraints. Our study also identified TOHCC-specific algorithms adapted from international and Canadian guidelines to guide management of common issues addressed by the PSL as a potential strategy to improve care. Furthermore, there is ongoing need for improved strategies to better incorporate EMRs in patient care. These findings will inform future initiatives to improve the delivery of care via TOHCC support lines and may be applicable to cancer support lines at other centers.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s00520-022-07327-5>.

Author contribution HS, LV, FM, GL, MC, and SMG designed the survey. LV created the online version of survey. HS, LV, MC, and SMG prepared the protocol. SN e-mailed the survey to participants. HS did the statistical analysis and wrote the manuscript. All authors had full access to the data and take responsibility for the integrity of the data and accuracy of data analysis. All authors were involved in the critical review of the manuscript and approved the final version.

Funding This work was supported by the Rethinking Clinical Trials (REaCT) program at the Ottawa Hospital, which is supported by The Ottawa Hospital Foundation and its donors.

Data availability The dataset generated during and/or analyzed during the current study are available from the corresponding author on request with approval of the Ottawa Hospital Science Network Research Ethics Board.

Declarations

Consent to participate Participation and completion of the survey implied consent to participate.

Consent for publication Participation and completion of the survey implied consent to publication of aggregate survey findings.

Conflict of interest The authors declare no competing interests.

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