# Building Palliative Care Capacity for Generalist Providers in the Community: Results From the Capaciti Pilot Education Program

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## Abstract

**Objective:** Primary care providers play an important role in providing early palliative care, however they often lack practical supports to operationalize this approach in practice. CAPACITI is a virtual training program aimed at providing practical tips, strategies, and action plans to help primary care providers offer an early palliative approach to care. The CAPACITI pilot program consisted of 10 facilitated, monthly training sessions, covering identification and assessment, communication, and engaging caregivers and specialists. We present the findings of an evaluation of the pilot program. **Method:** We conducted a single cohort study of primary care providers who participated in CAPACITI. Study outcomes were the change in the percentage of caseload reported as requiring palliative care and improved confidence in competencies measured on a 20-item, study-created survey. Pre and post survey data were analyzed using paired t-tests. **Results:** Twenty-two teams representing 127 care providers (including 36 physicians and 28 Nurse Practitioners) completed CAPACITI. Paired comparisons showed a moderate improvement in confidence across the competencies covered (.6 to 1.3 mean improvement across items using seven-point scales, all $P < .05$). Pre-CAPACITI, clinician prescribers ($N = 32$) identified a mean of 1.2% of their caseload requiring a palliative approach to care, which increased to 1.6% post-program ($P = .02$). Said differently, the total group of paired clinician prescribers identified 338 patients as requiring palliative care in their caseloads at baseline vs 482 patients following the intervention, for an overall increase of 144 patients in their collective caseloads. **Conclusion:** CAPACITI improved self-assessed palliative care identification and provider confidence in core competencies. The program demonstrated potential for building palliative care capacity in primary care teams.

## Keywords

palliative care, hospice care, education, health personnel, training programs, staff development, professional competence

## Introduction

Systematic reviews show that home- and community-based palliative care teams, comprised of physicians and interprofessional care providers, improve quality-of-life, reduce symptom burden (e.g., pain, dyspnea, etc.), and lower family caregiver distress.[1-6] However, research has shown there are insufficient numbers of specialist palliative care providers, especially in the community, to meet the growing demand for palliative approaches to care in the community.[7-9] Research has also shown that effective home-based palliative care need not be exclusively delivered by specialist palliative care physicians.[10] Home- and community-based palliative care can be effectively delivered by primary care providers including physicians, nurses, social workers and other allied health professionals working within interprofessional primary care

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teams.[11-13] Considering longitudinal relationships and continuity of care, generalist primary care providers are ideally positioned to provide early, upstream interventions to integrate palliative approaches to care.[14] While many primary care providers report a willingness to provide palliative care, they often lack the appropriate training and practical supports to operationalize this approach in practice.[15,16]

There are few examples of large-scale evidence-based programs that build palliative care capacity among primary care teams. One example is the Catalonia World Health Organization's palliative care demonstration project. Started in 1990, this palliative care model, has been shown to increase provider capacity, patient and family satisfaction, and lead to cost savings.[17,18] Another is the UK's Gold Standards Framework, which started in 2003, and was shown to be effective in primary care, long-term care, and hospitals across the country.[19-21] A review of 15 publications evaluating the Gold Standards Framework found that introduction of the program facilitated teams to identify more patients on a palliative care registry and earlier before death; helped teams develop stronger interprofessional coordination; and increased family caregiver satisfaction.[19] In Canada, the Learning Essential Approaches to Palliative care (LEAP) course is a widely implemented training program,[22-24] which has been reported to be highly relevant to interdisciplinary practice and to result in implementation of core palliative care competencies.[25,26] LEAP is a 2-day class-based course, offering evidence-based training on a broad range of topics from palliative care awareness to symptom management in the last days/hours. LEAP pilot studies in cancer and primary care settings have shown that this training program, combined with practice supports, such as an integrated care model, can increase provider confidence and access to primary-level palliative care.[27,28]

In Canada and other countries, where financial incentives, electronic registries, and other facilitators for scaling palliative care are absent, encouraging the application of these skills among community-based providers remains a challenge. Knowledge translation science highlights how critical it is to adapt interventions, including skills and tools, to the local context and resources.[29-31] An effective educational program should deepen foundational knowledge on a palliative approach to care for primary care providers that could be used regardless of how health care systems are structured.[32] However, research on effective training strategies using facilitation to optimize the adaptation of knowledge into local practice, especially those using virtual strategies so they can be scaled widely, remains a gap in palliative care education.[33]

To complement programs such as LEAP and further build interdisciplinary palliative care competency and practice change through a tailored training approach using strictly virtual methods, our study team developed an education intervention called CAPACITI, which stands for Community Access to PAlliative Care via Interprofessional Teams Intervention. The program was created from primary care and palliative care experts across Canada. CAPACITI is a virtual training program aimed at providing practical tips, strategies, and action plans to help primary care teams operationalize and offer an early palliative approach to care. The aim of this paper is to report on the evaluation of the pilot of CAPACITI, designed to improve the health care providers' ability to identify patients who could benefit from a palliative approach to care and providers' competencies in providing this approach.

## Methods

### Study design and Participants

This was a quasi-experimental, cohort study. Primary care teams from Ontario, Canada were invited to enroll in CAPACITI through advertising across provincial primary care and palliative care organizations and networks. CAPACITI was designed for generalist clinicians, e.g., primary care physicians and nurses, wanting to embed a palliative approach to care into their team practice. Participants in CAPACITI had to have an established role in providing palliative care to their patients, defined as managing symptoms, addressing psychosocial needs, educating patients and families, and coordinating care; and could include physicians, nurses, social workers, office assistants, patient coordinators, etc. Prior to enrollment in CAPACITI, participants were encouraged to have completed a standardized, evidence-based, clinical education program, namely Pallium Canada's LEAP course. LEAP is a national palliative care education program for health care providers in Canada,[34,35] covering topics such as complex management for common symptoms such as pain, delirium, constipation, depression, grief, etc.

### Intervention

CAPACITI is an educational program consisting of 10 facilitated modules, each covering a critical topic to initiating earlier palliative care. Topics include building a strong team, identification and assessment, communication, and engaging caregivers and specialists. The specific topic, objective, tools, and activities for each module are shown in Table 1. CAPACITI was developed based on an extensive review of existing palliative care training programs and input from national experts. We integrated training materials and clinical tools from effective and relevant palliative care education programs, such as the Gold Standards Framework in the United Kingdom,[19] the Palliative Care Program Development Framework,[36] and the Practice Support Program in British Columbia.[37]

Each CAPACITI module comprised three components: practice support education in the form of expert advice and tips; evidence-based tools; and high-facilitation and expert coaching for adaptation to local context (see Figure 1 for CAPACITI education components). Each module of

**Table 1.** Topics and Content of the Capaciti Program.

| Topic | Session objectives | Tools and resources[a] | 30 day assignments |
|---|---|---|---|
| S1<br>How to get started: Building a strong team | Describe evidence related to building strong teams<br>Assess your team's readiness to get started | Sentinel event analysis tool | Discuss a sentinel event and reflect on patients who'd benefit from an early palliative care approach. |
| S2<br>Identification and monitoring of patients at end of life | Describe tools to identify those who'd benefit from a palliative care approach–start with those at end of life | Supportive and palliative care indicators tool (SPICT) | Identify patients that could benefit from a palliative care approach. |
| | Describe strategies to track and monitor identified patients | Prognostic indicator guidance (PIG) tool (Ontario adaption)<br>Palliative Care registry examples | Create a registry |
| S3<br>Identification and monitoring of patients at early/transitional stages | Describe tools/processes to identify (and track) patients who are in a transitional stage and could benefit from a palliative care approach | Same as S2 | Identify early and transitional patients in your practice requiring a palliative care approach and adjust strategy for monitoring them in a registry or list |
| S4 | Describe the value of and how to initiate open, early conversations with patients and families about serious illness communicating with patients and families about serious illness: Part 1 | Model of person-centered conversation<br>Goals of care model video<br>Speak up ontario guide to advance care planning<br>Serious illness conversation guide (Ariadne Labs) | Watch the goals of care model conversation video |
| S5<br>Communicating with patients and families into practice about serious illness: Part 2 | Describe a process to incorporate having conversations about serious illness | Same as S4 | Have an "open" conversation with a few patients with a serious illness and create a strategy in your practice for having these conversations |
| S6 | Describe clinical practices that support assessment of transitional and EOL patients | Palliative Performance Scale (PPS) tool | Assess the holistic needs of a few patients you identified |
| Assessing Patient Needs | Describe a process for on-going assessment | Clinical frailty scale<br>Distress thermometer<br>Edmonton symptom assessment system (ESAS)<br>Canadian problem checklist | |
| S7 | Describe everyday clinical practices that support proactive care planning for Care Planning with the Patient transitional and EOL patients | Research paper describing triggers for upstream identification, proactive practices, and broadened care team | Create a plan to shift to proactive care planning strategies |
| S8<br>Care planning with the broader care team | Describe ways to use the broader network of local resources and customize strategies for after-hours care with broader team | Examples of contact lists of external partners | Create a community resource list with contact information<br>Create an afterhours/urgent care plan |
| S9<br>Engaging the Family | Recognize the role of the family caregiver<br>Caregiver Describe ways to activate the patient's informal care team (e.g., caregiver) | Carer support needs assessment tool (CSNAT) UK<br>Virtualhospice.ca discussion forums for caregivers | Assess the needs of a few caregivers and explore how the caregiver can be part of the care team |
| S10<br>Engaging with specialists and sustaining | Determine how/when to interact with: (i) disease specialists; (ii) local palliative | Who, When, and How to ask for help primer to engaging specialists | Consult with disease/palliative care specialist |

[a]A summary sheet is provided for each session as a quick reference guide to assist with the monthly assignment and implement the process in practice, in general.
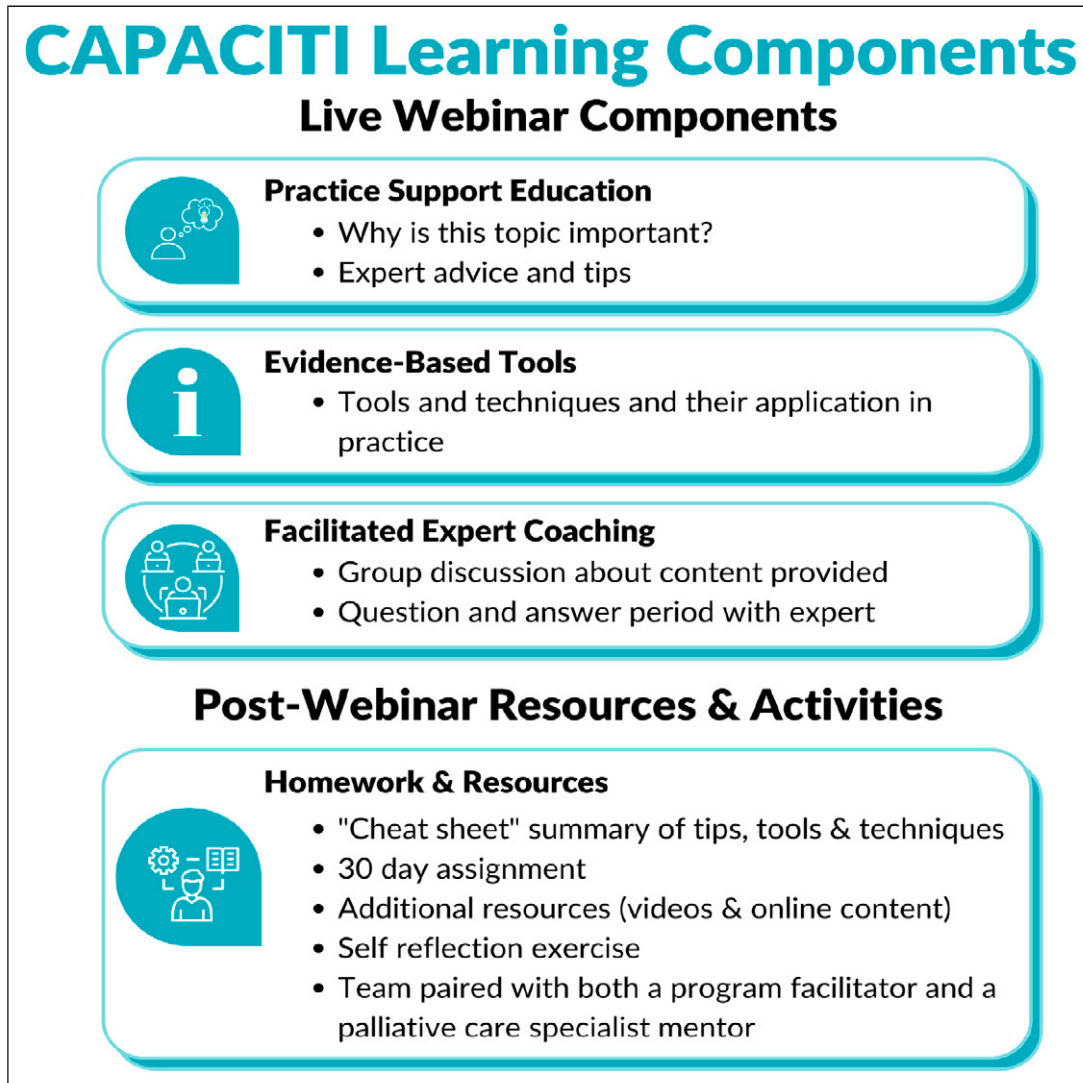
# CAPACITI Learning Components
## Live Webinar Components

**Practice Support Education**
- Why is this topic important?
- Expert advice and tips

**Evidence-Based Tools**
- Tools and techniques and their application in practice

**Facilitated Expert Coaching**
- Group discussion about content provided
- Question and answer period with expert

## Post-Webinar Resources & Activities

**Homework & Resources**
- "Cheat sheet" summary of tips, tools & techniques
- 30 day assignment
- Additional resources (videos & online content)
- Self reflection exercise
- Team paired with both a program facilitator and a palliative care specialist mentor

**Figure 1.** Learning Components of the CAPACITI Program.

CAPACITI featured a monthly webinar (1-hour each). The sessions were virtual, with a didactic component with slides and videos, followed by an interactive component with an expert, where the expert offered relevant practical tips from their experiences and participants could ask questions, as well as share their own experiences. Typically, a case example was presented followed by prompts, such as "What would you say/do next?" or "How can you apply this into your practice?" to initiate an open discussion.

Practice supports focused on how to operationalize the clinical knowledge, guideline or pathways into their clinical practice. Generally these supports focused on strategies for system coordination (e.g., palliative care registry, after-hours access, resource contact lists, etc.) and strategies for team collaboration (e.g., weekly team rounds, integrating with disease-specific providers, engaging caregivers, role clarification exercises, etc.).[38]

Evidence-based tools for symptom management and care pathways were incorporated into CAPACITI materials to support processes for health care providers to provide community-based palliative care. For example, health care providers learned to use prognostic tools for early identification of patients in need of palliative care (e.g., GSF-PIG), that have been validated in primary care settings.[39-42] All program materials, including recordings of the virtual sessions, slide decks, tools, "cheat sheets", etc., could be viewed and downloaded by participants until 2 months after the final session.

Each CAPACITI session had a facilitator to guide the discussion and introduce the 30-day assignment to apply the content into practice. The 30-day assignments are listed in Table 1, for example, "Create a registry of patients identified as requiring palliative care." The completion of these assignments was voluntary but strongly encouraged, with time

designated in the following virtual session for participants to share their work. Additionally, a program facilitator was assigned to each health care provider team to respond to questions regarding CAPACITI content, materials, or activities for the duration of the program. A local palliative care specialist was also paired with each team to provide them with mentorship. The nature and duration of this relationship was at the discretion of the respective team.

## Data Collection and Questionnaire

Participants completed the study questionnaire prior to CAPACITI intervention (baseline), at the midpoint, and upon completion of the intervention (post). The data collection tool was a questionnaire that contained 3 sections: basic health care provider/team characteristics, CAPACITI Competencies survey, and Patient Palliative Care Identification. The latter was defined as the proportion of case load identified as requiring a palliative approach to care. Health care providers/team characteristics collected were profession/role, years at current site or practice, team model, and LEAP completion (Y/N). Health care providers were emailed the link to the online questionnaire (SurveyMonkey) at each survey time point. We followed the Dillman Tailored Design Method to administer the questionnaire with up to five follow-up emails to non-responders.[43] We recorded attendance at the virtual sessions according to those logged into the on-line conference and verification of attendee lists with each team after the session.

## Practice Caseload and Palliative Care Identification (Primary Outcome)

We collected caseload data from health care providers who indicated that they were a prescriber (physician or nurse practitioner) with a defined patient practice caseload. These prescribers were asked to estimate: (A) the number of patients in their own unique practice, and (B) how many of these patients they have currently identified as requiring a palliative approach to care. The percentage identified was calculated as B/A*100. The analysis was based upon individual paired differences in these calculated percentages between baseline and post-program responses.

## Capaciti Competencies Survey (Secondary Outcome)

We developed the CAPACITI Competencies Survey based on the CanMEDS framework for improving patient care by enhancing physician training and the topics covered in the CAPACITI program. CanMEDS, developed by the Royal College of Physicians in Canada, delineates critical competencies to effectively meeting the health care needs of patients, including communication, expertise, collaboration, advocacy,

and commitment.[44] Each item on the CAPACITI Competencies Survey is scored on a 7-point Likert scale ranging from 1 (lowest level of confidence) to 7 (greatest level of confidence). The survey was only completed by health care providers who indicated that they provide direct care. We pilot tested the survey with 33 multidisciplinary health care providers prior to its use to study the CAPACITI training intervention. No modifications were deemed necessary based on the pilot test results.

## Data Analysis and Sample Size

The unit of analysis for this study was the individual participant and the primary analyses focused only on those that reported providing care to patients. The analysis was based upon individual paired differences in scores between baseline and post-program responses. Data were analyzed using SPSS software version 28 using descriptive and inferential statistics (paired t-tests and ANOVA). The significance level was set at .05. We confirmed the normal distribution of the data by Kolmogorov-Smirnov (KS) test (P > .05) prior to the paired analysis. The sample size calculation was based on CAPACITI Competencies Survey mean scores having a 1-point standard deviation, from the pilot data. Ethical approval for this study was obtained from the Hamilton Integrated Research Ethics Board (#7054).

## Results

The CAPACITI sessions ran monthly from January 2020 to March 2021. The program was paused for 6 months from April to August 2020 due to the COVID-19 pandemic. Of the 26 teams that started CAPACITI, 4 dropped out after Session 3 (27 participants) because of COVID-related redeployment of their team members. This resulted in a total of 159 participants across 22 teams that completed the CAPACITI intervention, representing a diversity on rural and urban setting across Ontario. Participants per team ranged from 2 to 15 health care providers (median = 7). Most (75%) participants reported having completed LEAP training prior to CAPACITI. All 22 teams attended the 10 virtual sessions, except for 1 team that missed Sessions 9 and 10 and another team that missed Session 10. Among the teams, the number of individual participants that attended each virtual session ranged from 87 to 104.

Of the 159 total participants, 27 were care coordinators, administrators, or managers, who did not provide direct care to patients. Our analysis focuses on the 127 health care providers who indicated that they provide direct care and therefore could respond to care competency items on the questionnaire. The characteristics of these health care providers are presented in Table 2. Half of these respondents reported being at their current site or practice for over five years.

**Table 2.** Charactistics of Capaciti Program Health Care Provider Participants.

| Chararteristics | All direct care health care providers (n = 127) | Direct care health care providers paired pre/post (n = 77) |
|---|---|---|
| | n (%) | n (%) |
| Profession/role | | |
| Physician | 36 (28.3) | 19 (24.7) |
| Nurse practitioner | 28 (22.0) | 18 (23.4) |
| Registered Nurse | 27 (21.3) | 19 (24.7) |
| Social worker | 15 (11.8) | 8 (10.4) |
| Pharmacist | 7 (5.5) | 4 (5.2) |
| Registered practical nurse | 6 (4.7) | 2 (2.6) |
| Dietitian | 4 (3.1) | 3 (3.9) |
| Other allied health | 4 (3.1) | 4 (5.2) |
| Years at current site or practice | | |
| Less than 1 year | 23 (18.1) | 14 (18.2) |
| One year to less than 2 years | 17 (13.4) | 8 (10.4) |
| 2 years to less than five years | 23 (18.1) | 14 (18.2) |
| More than 5 years | 64 (50.4) | 41 (53.2) |

## Palliative Care Identification

A total of 58 physicians and nurse practitioners identified themselves as a prescriber on the baseline questionnaire; and 38 (65.5%) prescribers provided their individual caseload and palliative care estimates at both baseline and post intervention. We excluded 6 prescribers who indicated their caseloads were primarily a palliative care focus (i.e., majority of patients requiring palliative care), and thus their caseloads did not represent generalist practices intended for CAPACITI. The pre/post identification data estimates of the remaining 32 prescribers were used for the paired analysis.

These prescribers reported caseload sizes at baseline ranging from 150 to 1800 patients (mean=898). In total, the paired clinician prescribers reported identifying 338 patients as requiring palliative care in their caseload at baseline and 482 of their patients requiring palliative care following the intervention, for an overall increase of 144 patients (post caseload mean = 936). At baseline, the number of patients identified as requiring palliative care ranged from 0 to 30 patients (mean of 1.2% (SD = 1.1)). After CAPACITI, this overall mean percentage increased to 1.6% (SD=1.5) for a significant paired mean difference increase of .43 (SD = 1.0) (95% CI .06-.79, $t = 2.39$, $P = .02$) or a 36% increase from baseline. Thus, following CAPACITI, on average, prescribers identified one additional patient requiring palliative care for every 233 patients in their practice.

## Health Care Provider Competencies in Palliative Care

All 127 health care providers completed the CAPACITI Competencies survey at baseline, where higher scores indicate greater confidence (seven-point scale). At baseline, the survey summary mean was 4.2 (SD = 1.1), ranging from the item "Care planning with the patient during a "crisis" (mean = 3.8) to "Making a home visit to the patient when needed" (mean = 5.0). Health care providers reported slightly greater confidence in "Identifying all patients requiring palliative care at end of life" (mean = 4.6) than those "Following diagnosis of a progressive life-limiting disease" (mean = 4.4). The data were normally distributed [summary mean, KS = .048, $P = .2$]. An analysis of the baseline data demonstrated a strong internal consistency (alpha = .96) among the Competency survey items.

Over the year and half span of the program, about a quarter of the health care providers participating in CAPACITI left their team at some point and were lost to follow-up. We were able to pair the survey scores of 77 (60.1%) health care providers from baseline to post-program. Paired comparisons of the individual survey items and summary total are presented in Table 3. The survey paired mean summary score was 4.2 (SD = 1.1) at baseline and 5.2 (SD = .9) post CAPACITI, which equates to a significant mean improvement of .96 (SD = .9) overall (95% CI .8-1.2, $t = 9.2$, $P < .001$). The paired differences of all survey items individually showed significant improvements, with mean increases from .6 to 1.3; none decreased over time. Specifically, "Confidence in identifying all patients requiring palliative care" improved an average of 1.1 points (SD 1.2). The item with the highest change in score was "Applying evidence-based tools to implement a palliative approach to care into practice" (paired mean change = 1.3, SD = 1.2), and the item with the least improvement in score was "making a home visit to the patient when needed" with a mean change in paired score of .6 (SD = 1.6).

## Discussion

In our pre-post evaluation of the CAPACITI education program, this intervention showed potential for building palliative care capacity in interprofessional primary care teams.

**Table 3.** Capaciti Competencies survey item scores and pre/post paired differences (n = 77).

| Capaciti competencies survey item | Baseline Mean | Baseline SD | Post Mean | Post SD | Baseline to post[a] Mean paired difference | Baseline to post[a] Standard deviation of paired differences |
|---|---|---|---|---|---|---|
| Identifying all patients requiring palliative care at end of life | 4.6 | 1.5 | 5.6 | 1.3 | 1.1 | 1.2 |
| Identifying all patients requiring palliative care following diagnosis of a progressive life-limiting disease | 4.4 | 1.6 | 5.3 | 1.2 | 0.9 | 1.5 |
| Having an open, honest conversation with patients about their illness trajectory | 4.3 | 1.4 | 5.2 | 1.1 | 1.0 | 1.3 |
| Ongoing assessment of patients' palliative care needs | 4.2 | 1.4 | 5.4 | 1.0 | 1.2 | 1.3 |
| Ongoing management of patients' palliative care needs | 4.1 | 1.4 | 5.1 | 1.1 | 0.9 | 1.3 |
| Care planning with the patient following diagnosis of a progressive life-limiting disease | 4.1 | 1.4 | 5.2 | 1.1 | 1.1 | 1.2 |
| Care planning with the family caregiver following diagnosis of a progressive life-limiting disease | 4.1 | 1.4 | 5.2 | 1.1 | 1.1 | 1.4 |
| Care planning with the patient during a "crisis" (e.g., rapid exacerbation of symptoms) | 3.8 | 1.5 | 4.9 | 1.3 | 1.1 | 1.4 |
| Care planning with the family caregiver during a "crisis" | 3.8 | 1.4 | 4.9 | 1.2 | 1.1 | 1.5 |
| Care planning with the patient during the end of life stage | 4.2 | 1.5 | 5.2 | 1.2 | 1.0 | 1.3 |
| Care planning with the family caregiver during the end of life stage | 4.1 | 1.5 | 5.3 | 1.1 | 1.1 | 1.3 |
| Making a home visit to the patient when needed | 5.0 | 1.7 | 5.5 | 1.5 | 0.6 | 1.6 |
| Coordinating care planning with the patient's providers (e.g., pharmacist, home care nurse) who are outside of your team | 4.7 | 1.4 | 5.5 | 1.1 | 0.8 | 1.3 |
| Engaging with a Palliative Care Specialist regarding the patient's care | 4.5 | 1.6 | 5.2 | 1.4 | 0.7 | 1.6 |
| Connecting directly with Disease Specialists regarding the patient's care | 4.2 | 1.5 | 4.8 | 1.4 | 0.6 | 1.5 |
| Keeping abreast of all local community support services relevant to palliative care | 4.1 | 1.5 | 4.9 | 1.3 | 0.9 | 1.4 |
| Ongoing reflection and strategizing on ways to strengthen how your team works with each other | 4.3 | 1.4 | 5.2 | 1.1 | 0.9 | 1.4 |
| Ongoing reflection and strategizing on ways to strengthen how your team works with external providers | 4.1 | 1.3 | 4.9 | 1.1 | 0.9 | 1.5 |
| Applying evidence based tools to implement a palliative care approach in your practice (e.g., tools to identify/monitor/assess patients) | 4.0 | 1.4 | 5.4 | 1.1 | 1.3 | 1.2 |
| Using data from your health information system (e.g., EMR or paper) to optimize a palliative care approach | 3.9 | 1.5 | 5.2 | 1.0 | 1.2 | 1.5 |
| Summary score | 4.2 | 1.1 | 5.2 | 0.9 | 1.0 | 0.9 |

Scale ranges from 1 = "lowest level of confidence" to 7 = "greatest level of confidence"
[a]This includes 18 health care providers whose final data point (Post) was the midpoint survey.

Prescribers in the pilot program identified a mean of 1.2% of their caseload requiring a palliative approach to care, which by the end of the program increased to 1.6% (representing a one-third increase from baseline). Our survey among all HCP participants examining competencies showed improvements in self-reported confidence in all the palliative care skill domains, despite most HCP participants scoring mid to high confidence prior to CAPACITI.

Palliative care identification is a critical first step to patients accessing these services. Our percentage increase of patients who would benefit from a palliative approach to care is comparable to the GSF studies in UK primary care practices.

Clifford and colleagues (18)[19-21] reported on the impact of the GSF curriculum on identification of patients requiring end-of-life care in ten large practices (2400 to 33 000 patient caseload), where general practitioners identified between .3% to 1.1% of their caseload, post GSF. Pre/post GSF data on the practices showed an average increase of .4 in the percentage of patients identified requiring palliative care. A randomized trial by Thoonsen and colleagues[45] also found that a training session in early identification and proactive palliative care planning increased palliative care identification a year later; the intervention physicians identified a median of 3 patients (mean caseload = 1579) compared to 2 patients in the

non-intervention arm (mean caseload = 1389). These programs endorsed the use of a tool with a list of indicators of patients requiring early palliative care, which may help operationalize screening for this need as a routine practice. However, a systematic review of palliative care screening tools in primary care cautioned that most tools are based on predicting mortality and deterioration, but do not help anticipate palliative care needs, especially early on in the disease trajectory.[46] CAPACITI is intended to complement existing programs that teach clinical skills in palliative care by using strictly virtual education; it appears to improve identification rates and other competencies, even among providers with prior palliative care training.

CAPACITI also differs from many previous training interventions in the comprehensiveness of the topics covered. A recent systematic review of trials of palliative care education interventions for health care providers found that many of these initiatives focus on illness communication or symptom management rather than a wider array of skills to implement a holistic palliative approach to care.[33] Less than half (45%) of the 22 training interventions reviewed contained 4 or more the 6 components considered to comprise comprehensive palliative care, based on the National Consensus Project for Quality Palliative Care domains.[47] In that review, almost half (10) of the trials measured self-reported competency in the aspects of palliative care taught. Similar to our results, 70% (7) of the studies reported a significant positive effect on that outcome.[33] Other reviews[13,48-53] have concluded that interactive education inventions for health care providers show promise for building capacity in palliative care; however, further high-level evidence is required of comprehensive training programs, examining more objective measures of behavior change in practice.

CAPACITI is an interdisciplinary, practical, and virtual program for generalist health care providers. Prior palliative care training interventions studied often focused on teaching one provider type, such as nurses or physicians.[33,49-51] Health care provider collaboration is critical to ensuring access to and providing, holistic palliative care.[54,55] CAPACITI complements other educational interventions by focusing on enhancing practical processes and change strategies to enable application of these core palliative care skills in clinical practice. Lastly, CAPACITI being offered on-line, as opposed to in a classroom setting, improves the feasibility of health care providers attending the educational sessions. This remote access also increases the potential of the program to scale widely.

## Limitations

The are several limitations to our findings. Our pre-post study did not include a comparison group without CAPACITI. Single arm studies are more prone to bias due to participants intentionally scoring higher following the intervention, based on expectation of improved performance. This effect may be mitigated by the fact that most health care providers scored relatively high in competence at baseline, and that over 16 months passed between the survey timepoints, making recall and deliberate inflation of these scores more difficult and less likely. Our findings may not be generalizable to other health care systems, particularly those where standardized processes, universal electronic medical records, or financial incentives to promote palliative care delivery are more commonplace. In the absence of these facilitating factors, CAPACITI nonetheless was associated with positive practice outcomes. The use of self-reported measures presents another limitation as these do not necessarily imply behaviour change, especially over the long term. More objective measures of practice change, such as patient outcomes and documented changes in practice, need to be considered in assessing health care provider educational interventions.[33] Incorporating role play with simulated or real patients in palliative care training and evaluation show promise for improving knowledge translation and capturing behaviour change, warranting consideration and further research.[56-58] Finally, the COVID-19 pandemic struck early during the intervention and the introduction of COVID measures became a priority for the teams, which contributed to health care provider dropout in the study and less time for participants to spend on CAPACITI activities. Though the intervention was placed on hold for 6 months and was completed during the pandemic, we still observed a positive effect to the program on all competency measures.

## Conclusion

CAPACITI represents a comprehensive program that builds palliative care capacity within existing primary care teams, without adding new front-line human resources. Our pilot evaluation of CAPACITI showed that it increased the identification of patients for a palliative approach to care, improved confidence in palliative care identification and in other competencies to deliver an early palliative approach to care among interdisciplinary health care providers, including nurses, physicians, and allied health providers. To contextualize findings, health care providers' perception of the impact of CAPACITI will be presented in subsequent publications. A randomized controlled trial of this intervention is required to ascertain rigorously CAPACITI's potential for strengthening palliative care in the primary care system and increasing access to the care earlier in the illness trajectory.

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