A clustered randomized controlled trial of symptom screening and automatic referral for supportive care for patients with GI cancer care needs

by Philippa Hawley, Narsis Afghari, Catherine Courteau

ABSTRACT

Purpose: *To explore the impact of implementation of a symptom screening and supportive/palliative care referral pathway in patients newly referred to a Canadian gastrointestinal medical oncology clinic.*

Methods: *Eighty-eight subjects were recruited in each study arm. Intervention subjects were assessed by a member of the supportive/palliative care team if they had a severity score of >3/10 on the Edmonton Symptom Assessment System. Controls received normal care, including discretionary referral. Symptom severity was assessed over the subsequent five months. Data on survival, care setting of death (home, hospice or hospital) and long-term resource use were also collected.*

Results: *Screening led to 141 specialist supportive/palliative care visits in the intervention arm versus only nine in the control arm. There were, however, no subsequent significant differences in symptom severity or the long-term outcomes measured. Many patients identified by the >3/10 severity threshold did not need/want specialist supportive/palliative care referral, and those with severe distress were either identified by the oncology team already or were too unwell or overwhelmed to participate in the study. The specialist service was not overwhelmed. Important considerations on timing and mode of administration of screening tools were revealed.*

Conclusion: *Routine symptom screening can be burdensome for oncology patients and needs to be as simple as possible. Triaging positive screens is an important role for oncology nurses. Investment in training oncology teams to manage uncomplicated distress in the oncology clinic allows for optimal use of scarce supportive/palliative care specialist resources for patients with complex needs.*

AUTHOR NOTES

Philippa Hawley, B.Med., FRCPC (Pall Med), Provincial Medical Director, Pain & Symptom Management/Palliative Care, BC Cancer, Clinical Professor, Department of Medicine, University of British Columbia

Narsis Afghari, BSc, MSc, Clinical Trials Unit, BC Cancer

Catherine Courteau, MD, CM, CCFP (PC), Division of Palliative Care, University of British Columbia

Corresponding author: Dr. Philippa Hawley, BC Cancer Vancouver Centre, 600W 10th Ave, Vancouver, BC V5Z 4E6

phawley@bccancer.bc.ca

+1-(604) 250-2845

DOI:10.5737/23688076334452

INTRODUCTION

The scope of practice for palliative care now extends well beyond end-of-life care, including supportive care concurrent with potentially curative treatment, as described in the WHO definition of palliative care (WHO, 2018) and illustrated in the Bow Tie Model of 21st Century Palliative Care (Hawley, 2013). Early palliative care in oncology is generally defined as palliative care referral at the time of diagnosis of advanced (stage 4) cancer (Courteau et al., 2018; NCI, 2000). Early palliative care has been shown to have many benefits for patients and families, with no shortening of survival, and reduced costs to the health care system (Bischoff et al., 2013; Zimmermann et al., 2014; Hui et al., 2014, Jang et al., 2015; Ferrell et al., 2015; Vanbutsele et al., 2018; May et al., 2015). Nonetheless, the majority of palliative care referrals are made late, often only days or weeks before death (Wentland et al., 2012; Walling et al., 2013) and physical and emotional distress can be high.

However, cancer patients with stage 1, 2 or 3 disease are often just as physically and/or emotionally distressed as those with advanced disease, but may be reluctant to disclose symptoms to their oncologist (Kim et al., 2016; Barbera et al., 2010). Identifying the need for specialist supportive/palliative care services is challenging in a busy oncology clinic setting (Schenker, Bahary et al., 2018; Schenker, Crowley-Matoka et al., 2014; Blackhall et al., 2016; Xiao et al., 2013). The oncology nurse is in the best position to identify patient distress and is most likely the first healthcare professional to review any distress screening tool results (Fadhlaoui et al., 2022). Due to rapidly evolving new cancer therapies, prognosis is increasingly difficult to predict (Hui & Bruera, 2015). However, physical symptoms and psychosocial distress are criteria that could guide the development of standardized referral pathways (Burt & Kamal, 2018). Systematic use of patient questionnaires is expensive to implement and can be burdensome for patients (Antunes et al., 2014; Etkind et al., 2015).

We explored the implementation of a symptom screening and supportive/palliative care referral pathway in patients newly referred to a Canadian gastrointestinal medical oncology

clinic. This study aimed to compare the effects of a paper symptom assessment process for referral to a combined supportive/palliative care service with the usual care of symptom assessment alone. The standard mechanism for psychosocial specialist and palliative care referral is oncologist discretion, when they feel they need assistance in meeting patient's supportive/palliative care needs. The BC Cancer Pain & Symptom Management/Palliative Care (PSMPC) service provides physician assessment and multidisciplinary management of distress in cancer patients at any stage of illness, in a consultative capacity, including prescribing. The care setting is an oncology centre in a culturally diverse urban location where approximately 30% of patients are non-English-speaking.

METHODS

Study Design

The study population for this randomized trial was patients with all stage gastro-intestinal (GI) cancers who consented to participate in the study at their first or second oncology clinic visit between March 3, 2015, and September 26, 2018. The GI tumour group of oncologists was selected because it was responsible for the most referrals to the PSMPC service.

The screening tool included the revised Edmonton Symptom Assessment Scale (ESASr) (Hui & Bruera, 2016; Chang et al., 2000), modified by having minimum, average and maximum pain scales, and a quality-of-life numerical scale. It also included the Canadian Problem Checklist (CPC) but this was not used for outcome assessment. The combined assessment tool is referred to as the Pain and Symptom Questionnaire (PSQ) and was already in routine use (see attached example). Patients who were not able to communicate in English and who did not have access to a translator were excluded.

The intervention arm was offered referral to the PSMPC team if they reported any ESASr score of >3/10 (Woo et al., 2015). Patients in the control arm would only see the PSMPC team if a referral was requested by the oncologist (usual care). Patients in both study arms had to complete the PSQ, which was not usual care in the GI clinic.

Patients of one oncologist who was trained in both medical oncology and palliative care were excluded. All nine other oncologists participated. The British Columbia Ministry of Health provided data on survival, hospital visits, home care use, and location of death for the 12 months after the last study visit for each patient.

The outcomes for the study were:

- Effect on symptoms and quality of life over five months
- Long-term impact on resource utilization or location of death.

Sample size

The sample size calculation was based on the premise that better symptom control was the primary outcome of interest. This outcome was demonstrated by change in the ESASr total distress score, using a method recommended by Hemming et al. (2011). This outcome meant 152 subjects would be required to demonstrate a difference in mean symptom severity of at least 1/10 (Hui et al., 2015). Adding 15% to account for expected dropouts made our target sample for recruitment 176.

Randomization

Oncologists were assigned by cluster randomization (Torgerson, 2001). Halfway through recruitment, the oncologists were re-randomized to ensure balancing of the study arms. One of the oncologists moved from the intervention arm to the control arm and two from the intervention arm were replaced.

Study Interventions

All patients referred for a first consultation with the GI medical oncology clinic were identified by telephone in advance by a research assistant (RA). The RA approached interested patients in the waiting room or delegated this to the palliative care nurse due to scheduling conflicts. Participants were not made aware that there were two arms to the study. The consent form referred to the intervention as "Supportive Care." Participants completed the PSQ in person before their oncology appointments for up to five months/visits.

Intervention group

The oncology nurse reviewed the PSQ, and any concerns were drawn to the attention of the oncologist. If an ESASr score was >3/10, an RN or physician from the PSMPC team met right away with the patient, or the patient was seen at the PSMPC clinic at the first available opportunity, according to patient's preference.

Control group

Controls were made aware that they were free to raise any concerns with the oncology team, as per usual care.

Statistical analysis

Analysis was by intention to treat, using R version 3.4.3(2017-12-06) (R-3). Sensitivity analyses were done and methods including the last value carried forward and multiple imputation method were used to replace missing values (Rombach et al., 2016).

The ESASr total distress score over time was compared within and between groups. Bivariate analysis, including t-tests, and paired t-tests were used to compare the mean and median scores within and between groups. The type-1 error level and power of the study were pre-specified as 5% and 80%, respectively.

Quality of life was assessed via a single item with a 0-10 response scale, where 10 is the best overall quality of life and 0 the worst (see PSQ in appendix). The linear mixed model method was used to address differences in patients' homogeneity between oncologists. Results were adjusted for age at the time of enrolment, gender, oncologist, baseline symptom scores and adjusted for other symptoms (Azizabadi & Assari, 2010). The best regression model was chosen based on the lower Akaike Information Criterion.

It was expected that there would be attrition of participants, as some would not be receiving chemotherapy, and some would be followed for treatment in Community Oncology sites. To handle the expected missing values Multivariate Imputation by Chained Equations and the Last Observation Carried Forward methods were used to account for missing

data (Myers, 2000). The number of imputations needed for good statistical purposes was chosen based on Graham et al., 2007).

The survival analysis method compared the survival rates between groups, and a Kaplan Meier survival plot was completed (Goel et al., 2010). The linear regression model was used to evaluate the number of hospital visits and home care use (Schneider et al., 2010). The linear regression model was used to evaluate if the intervention affects the number of hospital visits (including urgent and elective), ER visits, and the frequency of using homecare service). The multinomial regression method was used to test the effect of the intervention on the care setting of death. All results were adjusted for baseline characteristics (Sperandei, 2014).

RESULTS

Demographic data and baseline symptoms scores

We screened 1,008 patients, of which 242 were approached for participation. The most common reasons for ineligibility were lack of ability to speak English and not being expected to be offered systemic therapy. Some were unable to be contacted prior to their appointment. Recruitment was stopped when 88 patients had consented in each arm (Figure 1). Dropouts were expected, but there was more attrition than we had planned for, less often due to death (15%) than for other reasons (59%) (Table 1). Most of these reasons were beyond our control (e.g., being transferred to a community oncology clinic or declining offered systemic therapy. Some patients missed appointments). Many withdrew because of not having time or not being well enough to complete the PSQ. From the first to last visit, the dropout numbers increased from 3/54 subjects (5%), to 6/50, 10/38, 11/30, 10/24 and 12/16 (75%). A small number of appointments was missed by the study team.

There was a male preponderance and average age was 64 years (Table 2). Three-quarters of the participants in each group had advanced cancer. The mean baseline ESASr score was higher among control group (23.41 versus 17.75) ($P<0.05$) overall and for tiredness, lack of appetite, anxiety, and wellbeing (Table 2).

Pain and symptom management / palliative care clinic (PSMPC) visits

Looking across the total of 227 visits by intervention participants, the threshold for referral was met by 61% at their baseline visit, and then between 71% and 83% for the first to fifth follow-up visits. However, screen-positive patients were seen by at least one member of the PSMPC team at only 100 (44%) of these visits. Forty-five patients were seen by the full PSMPC team and 55 by the PSMPC nurse alone, either because the nurse was able to meet their needs without physician support,

Figure 1

Recruitment and loss to follow-up

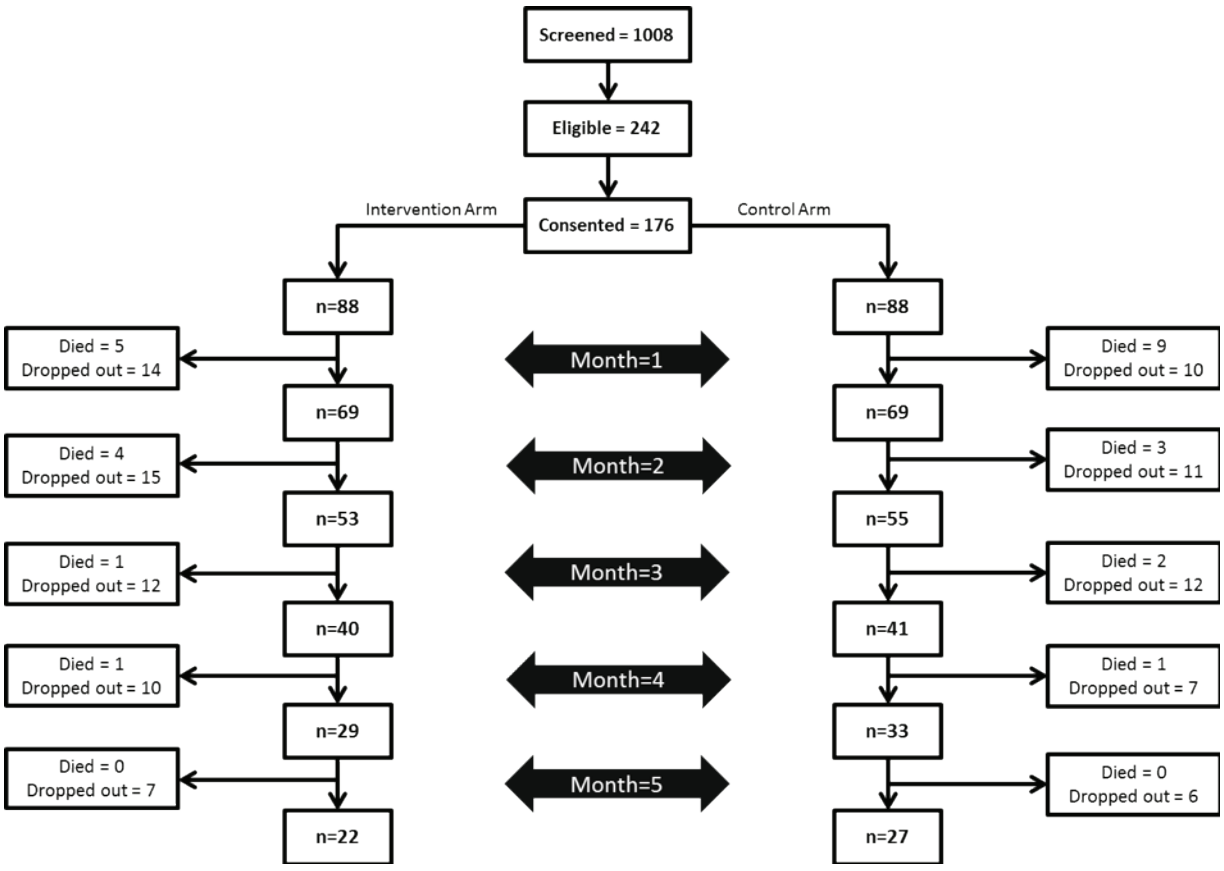


Table 1

Reasons for loss to follow-up

Reasons for Loss to follow-up	Intervention	Control	Total
After 1 month			
Died	5	9	14
Withdrew	0	2	
Missed	4	2	
Discharged	10	6	
Total	**14**	**10**	**24**
After 2 months			
Died	4	3	7
Withdrew	0	1	
Missed	3	8	
Discharged	9	2	
Total	**15**	**11**	**26**
After 3 months			
Died	1	2	3
Withdrew	0	1	
Missed	5	8	
Discharged	7	3	
Total	**12**	**12**	**24**
After 4 months			
Died	1	1	2
Withdrew	0	0	
Missed	9	6	
Discharged	1	1	
Total	**10**	**7**	**17**
After 5 months			
Died	0	0	0
Drop Out	1	1	
Missed	5	4	
Discharged	1	1	
Total	**7**	**6**	**13**

Table 2

Baseline Characteristics

Characteristics	Intervention (*n* = 88)	Control (*n* = 88)	*p*-value
Mean Age (year)	64.7	63.5	>0.05
Female (n)	34	30	>0.05
Patients with advanced cancer[1] (n)	63	63	>0.05
Mean Quality of Life [CI] (higher is better)	7.16 [6.69,7.63]	6.89 [6.39,7.39]	>0.05
Mean Maximum Pain [CI] (higher is worse)	3.27 [2.58,3.96]	3.43 [2.72,4.14]	>0.05
Mean ESASr score for 8 following symptoms [CI] (higher is worse)	17.75 [14.63,20.87]	23.41 [20.06,26.75]	**<0.05**
Tiredness [CI]	3.08 [2.51,3.65]	3.93 [3.35,4.51]	**<0.05**
Drowsiness [CI]	2.14 [1.63,2.65]	2.84 [2.14,3.54]	>0.05
Nausea [CI]	0.80 [0.48,1.12]	1.18 [0.73,1.63]	>0.05
Lack of Appetite [CI]	1.65 [1.13,2.17]	3.07 [2.38,3.76]	**<0.05**
Shortness of Breath [CI]	1.16 [0.73,1.59]	1.28 [0.85,1.71]	>0.05
Depression [CI]	1.19 [0.81,1.57]	1.61 [1.14,2.08]	>0.05
Anxiety [CI]	1.78 [1.33,2.23]	2.51 [1.99,3.03]	**<0.05**
Wellbeing [CI]	2.75 [2.26,3.24]	3.78 [3.25,4.31]	**<0.05**

[1] Advanced cancer: Stages III and IV including any sub-categories. Note: locally advanced but not resectable was considered as advanced.

or the patient did not want to pursue a full assessment, which would have necessitated waiting or returning at a different time. The threshold for PSMPC referral was met by 76% of the control participants at baseline, but only nine PSMPC referrals were made (Table 3).

For 127 visits in the intervention arm the patient screened positive, but did not go on to have a PSMPC consultation as a result. In 33 of these cases, the oncology nurse/physician was able to address the symptom(s) and a nutritionist in five. For 15 eligible visits (6.6%), there was no research assistant available to arrange the referral, though only eight had a symptom severity over 5/10. At 52 of the screen-positive visits, the patient declined referral to PSMPC, more commonly in the later visits during the patient's course of care: 5.5% declined at the baseline visit and then 12%, 26%, 37%, 42% and 75% from the first to fifth screen-positive follow-up visits, though the numbers at the later follow ups were small.

Quality of life, maximum pain and symptom severity

Though there were some trends in quality of life and symptom severity scores, which favoured the intervention group, over the first four months of follow-up, no trend was statistically significant (Figure 2). Specifically, we found no statistically significant change in the ESASr total distress score over time between the two groups (Figure 3).

Survival

Multivariable analysis showed there was no significant difference in survival time between the intervention and control groups (Figure 4). At a given instance of time, a participant in the intervention group was 0.99 times less likely to die than someone in the control group, adjusted for gender, age, ESASr score of 4 or more at the baseline, the total number of study visits, and the ESASr total score at the baseline [95% CI = 0.56, 1.78] ($p > 0.05$).

Table 3

Pain and symptom management / palliative care (PSMPC) visits

Time frame	Intervention Arm			Control Arm			P-Value
	Number of patients with ESASr score ≥4 out of 88	Number of PSMPC visits	%	Number of patients with ESASr score ≥4 out of 88	Number of PSMPC visits	%	
First visit	54	45	83%	67	3	4%	<0.05
Month 1	50	37	74%	57	2	4%	<0.05
Month 2	38	26	68%	42	2	5%	<0.05
Month 3	30	18	60%	31	1	3%	<0.05
Month 4	24	11	46%	24	1	4%	<0.05
Month 5	16	4	25%	22	0	0%	<0.05

Figure 2

Average Quality of Life Scores Over Time

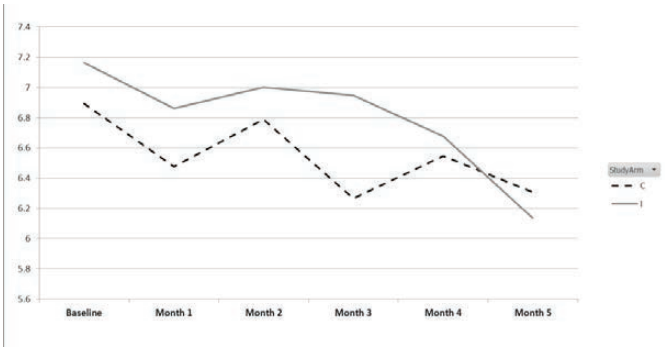


Figure 3

Total Symptom Distress Scores Over Time

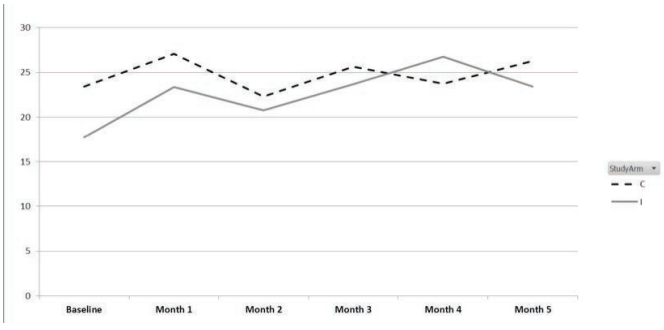
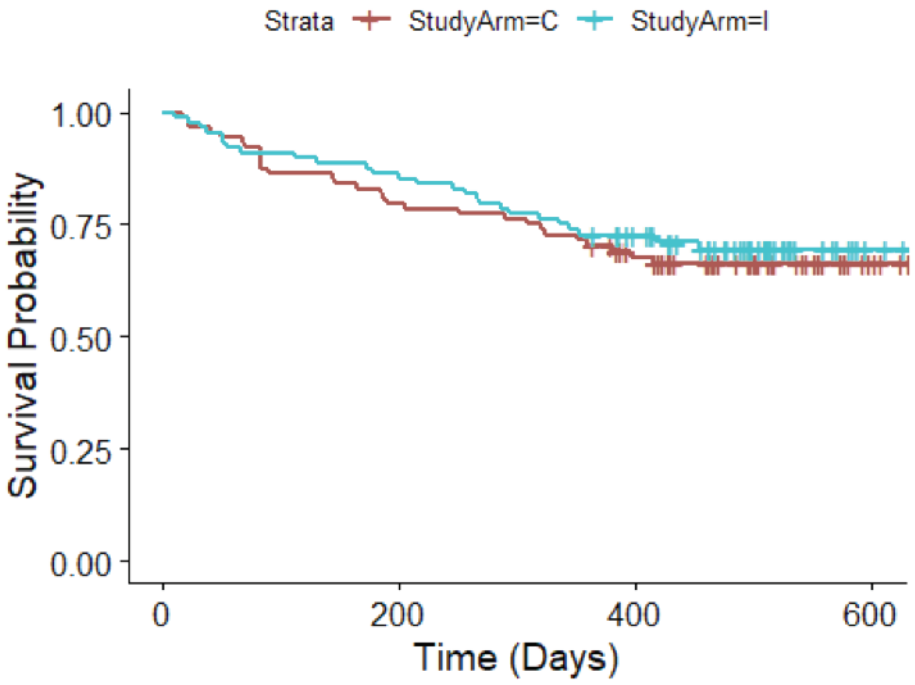


Figure 4

Survival over time for participants in the two groups



Resource use

Of the total 176 participants, 144 had a total of 379 hospital visits, including 236 elective visits and 143 urgent visits. The mean number of hospital visits per person was 2.15, consisting of 2.22/participant in the intervention group and 2.09/participant in the control group (Figure 5a).

Multivariable analysis showed a negative but statistically non-significant association between the study intervention and the average number of hospital visits. Results showed that on average the number of hospital visits (both urgent and elective) was 0.06 points lower among the intervention group in comparison with the control group [95% CI = -1.09, 0.97] (Figure 5b).

Figure 5a

Total number of hospital visits in the two groups

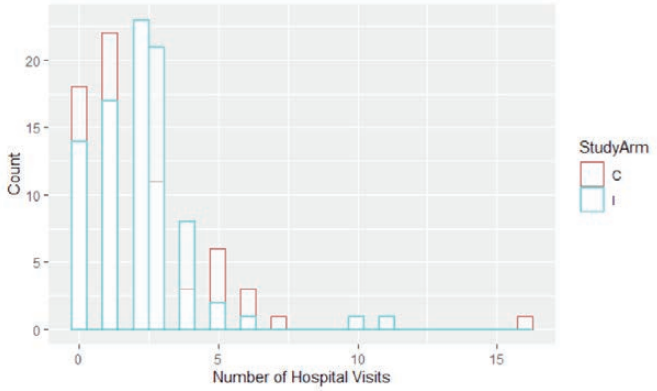
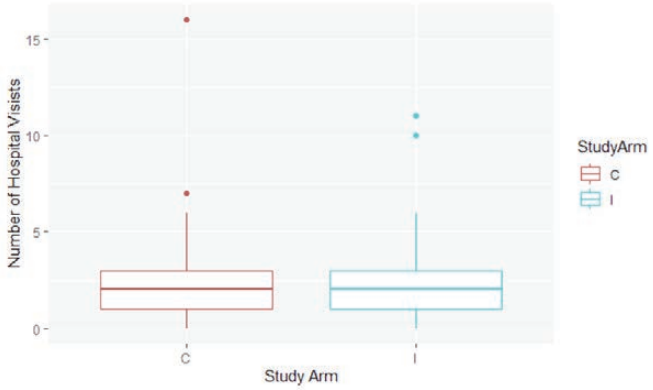


Figure 5b

Number of hospital visits – Comparing two groups



Also, multivariable analysis showed a positive but statistically non-significant association between the study intervention and the average number of urgent hospital visits. On average, the number of urgent hospital visits was 0.31 higher in the intervention group than the control group [95% CI = -0.32, 0.94].

There was a negative, but statistically non-significant association between the study intervention and the average number of elective hospital visits. On average, the number of elective hospital visits was 0.36 points lower among the intervention group in comparison with the control group [95% CI = -1.11, 0.38]. Results for all three of these analyses were adjusted for baseline characteristics, including age, gender, physician, and ESASr score.

Similarly, there was a small reduction in the average number of ER visits in the intervention group (-0.36, 95% CI -1.05, 0.36). The mean number of ER visits was 1.76, made up of 1.51 per participant in the intervention group and 2.01 in the control group (Figures 6a and 6b). None of these differences were statistically significant.

The only statistically significant difference we found between the groups, other than the specialist referral rate, was in the use of homecare support (Figure 7a). Home support services, as provided, were determined by an array of healthcare professionals caring for the patients, which may have had been influenced to some extent by the availability of services. A homecare service was used by 25 individuals in the intervention group and 37 individuals in the control group. The comparison between groups showed no significant association between using the homecare service and the study intervention. The odds of enrolling into a homecare service was 0.55 for someone in the intervention group compared to someone in the control group [95% CI= 0.28, 1.06]. (Figure 7b)

For the participants who were enrolled in a homecare service, the mean number of homecare service visits per participant was 7.03, made up of 7.16 visits in the intervention group and 6.94 visits in the control group (-1.98, 95% CI -3.91, -0.05).

Figure 6a

Total number of Emergency Department visits

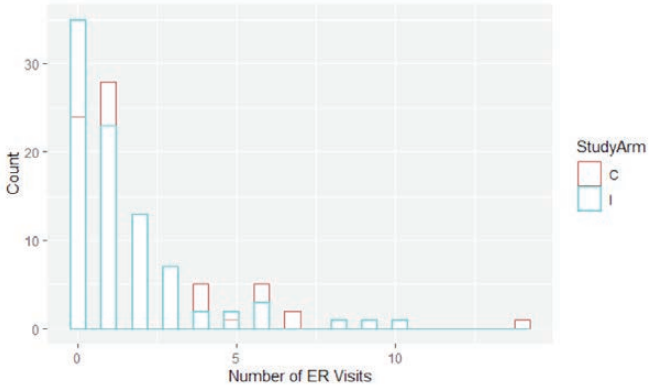


Figure 6b

Number of Emergency Department visits – Comparing two groups

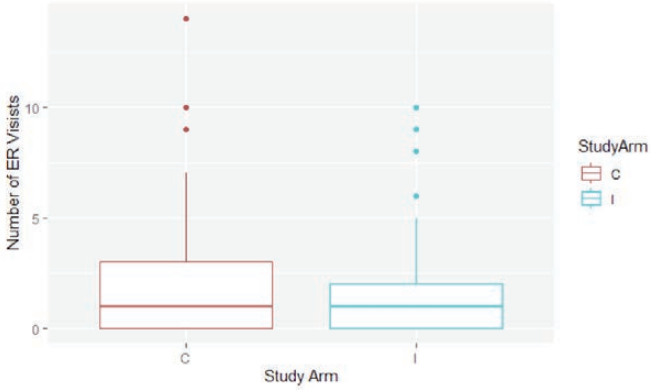


Figure 7a

Use of home care services by study groups

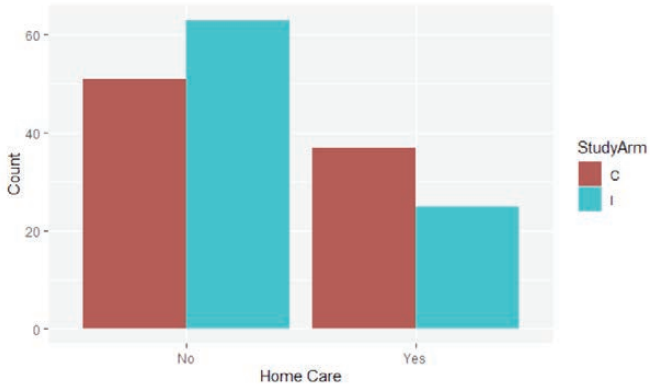
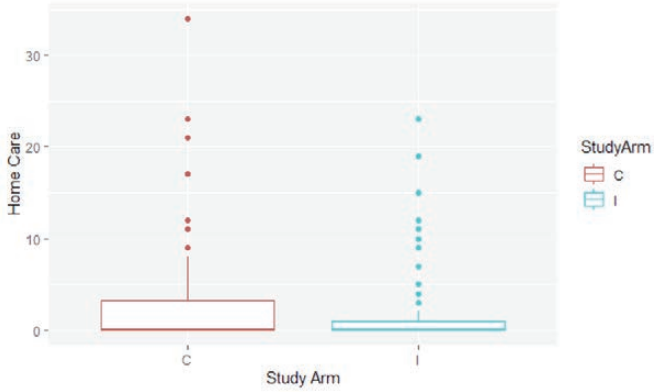


Figure 7b

Use of home care services – Comparing two groups



Location of death

Comparison of death location among the intervention and control groups showed there was no significant association between the death location and being in the intervention group (Table 4). The odds of dying at a private home versus dying in a hospital would decrease by 0.06 for someone in the intervention group in comparison to someone in the control group [95% CI = 0.001, 2.92].

Table 4

Location of death in each of the study groups

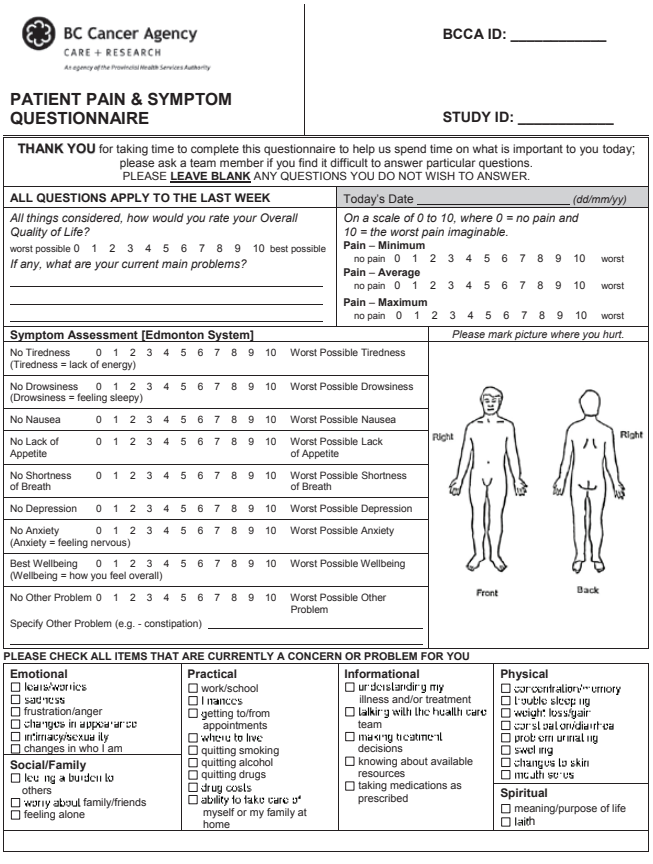
Location of Death	Study Arm		Total (*n* =55)
	Control (*n* = 29)	Intervention (*n* = 26)	
Hospital (% of arm)	15 (45.5%)	18 (54.5%)	33 (60.0%)
Other Health Care Facility (not a hospital) (% of arm)	6 (46.2%)	7 (53.8%)	13 (23.6%)
Other Specified Location	1	0	1 (1.8%)
Private Home	7 (87.5%)	1 (12.5%)	8 (14.5%)

DISCUSSION

We demonstrated that an ESASr threshold of 4/10 was a sensitive identifier of patients who might benefit from specialist supportive/palliative care. However, slightly less than half who met the threshold for referral actually required PSMPC team consultation, the remainder being able to have their needs met by their oncology team or another supportive care service, such as nutrition or counselling. Of those accepting PSMPC services, less than half required a full multidisciplinary consultation.

This is useful information on which to plan resource allocation for those contemplating similar distress screening. Supportive care services being overwhelmed when symptom and distress screening is implemented is unlikely to be a concern, providing that other healthcare providers involved have the resources within their own teams to respond. Triaging of screen-positive patients by oncology nurses will allow the most appropriate service to be involved.

The impact of screening on the commonly used long-term palliative care outcome measures we selected was disappointing. The intervention group had significantly higher mean ESASr scores for symptoms other than pain at baseline, but the two arms were otherwise well-matched and statistical analysis corrected for that small difference. Recruitment was challenging, and levels of distress were relatively low in those that consented to participate. Though there were some minor trends to early benefit for the intervention group, these were not sustained at five months. The only long-term outcome with a statistically



BC Cancer Agency
CARE + RESEARCH
An agency of the Provincial Health Services Authority

PATIENT PAIN & SYMPTOM QUESTIONNAIRE

BCCA ID: _____

STUDY ID: _____

THANK YOU for taking time to complete this questionnaire to help us spend time on what is important to you today; please ask a team member if you find it difficult to answer particular questions.
PLEASE **LEAVE BLANK** ANY QUESTIONS YOU DO NOT WISH TO ANSWER.

ALL QUESTIONS APPLY TO THE LAST WEEK — Today's Date _____ *(dd/mm/yy)*

All things considered, how would you rate your Overall Quality of Life?
worst possible 0 1 2 3 4 5 6 7 8 9 10 best possible

If any, what are your current main problems?
_____
_____
_____

On a scale of 0 to 10, where 0 = no pain and 10 = the worst pain imaginable.
Pain – Minimum no pain 0 1 2 3 4 5 6 7 8 9 10 worst
Pain – Average no pain 0 1 2 3 4 5 6 7 8 9 10 worst
Pain – Maximum no pain 0 1 2 3 4 5 6 7 8 9 10 worst

Symptom Assessment [Edmonton System] — *Please mark picture where you hurt.*

No Tiredness (Tiredness = lack of energy)	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Tiredness
No Drowsiness (Drowsiness = feeling sleepy)	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Drowsiness
No Nausea	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Nausea
No Lack of Appetite	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Lack of Appetite
No Shortness of Breath	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Shortness of Breath
No Depression	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Depression
No Anxiety (Anxiety = feeling nervous)	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Anxiety
Best Wellbeing (Wellbeing = how you feel overall)	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Wellbeing
No Other Problem	0 1 2 3 4 5 6 7 8 9 10	Worst Possible Other Problem

Specify Other Problem (e.g. - constipation) _____

Right Right Front Back

PLEASE CHECK ALL ITEMS THAT ARE CURRENTLY A CONCERN OR PROBLEM FOR YOU

Emotional
☐ fears/worries
☐ sadness
☐ frustration/anger
☐ changes in appearance
☐ intimacy/sexuality
☐ changes in who I am

Social/Family
☐ feeling a burden to others
☐ worry about family/friends
☐ feeling alone

Practical
☐ work/school
☐ finances
☐ getting to/from appointments
☐ where to live
☐ quitting smoking
☐ quitting alcohol
☐ quitting drugs
☐ drug costs
☐ ability to take care of myself or my family at home

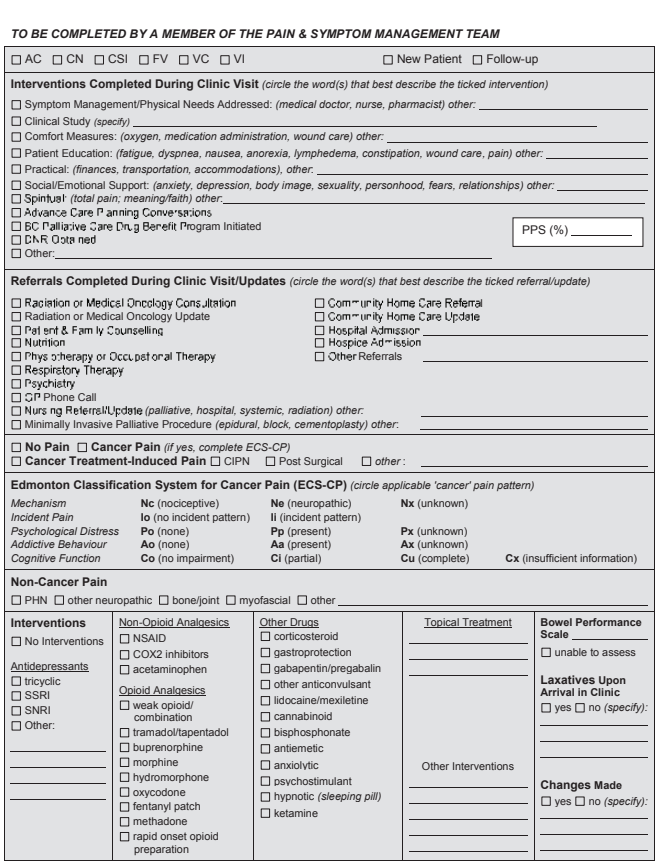
Informational
☐ understanding my illness and/or treatment
☐ talking with the health care team
☐ making treatment decisions
☐ knowing about available resources
☐ taking medications as prescribed

Physical
☐ concentration/memory
☐ trouble sleeping
☐ weight loss/gain
☐ constipation/diarrhea
☐ problem urinating
☐ swelling
☐ changes to skin
☐ mouth sores

Spiritual
☐ meaning/purpose of life
☐ faith

Supportive Care Study
Version: Dec. 17, 2014

Page 1 of 2



TO BE COMPLETED BY A MEMBER OF THE PAIN & SYMPTOM MANAGEMENT TEAM

☐ AC ☐ CN ☐ CSI ☐ FV ☐ VC ☐ VI ☐ New Patient ☐ Follow-up

Interventions Completed During Clinic Visit *(circle the word(s) that best describe the ticked intervention)*
☐ Symptom Management/Physical Needs Addressed: *(medical doctor, nurse, pharmacist) other:* _____
☐ Clinical Study *(specify)* _____
☐ Comfort Measures: *(oxygen, medication administration, wound care) other:* _____
☐ Patient Education: *(fatigue, dyspnea, nausea, anorexia, lymphedema, constipation, wound care, pain) other:* _____
☐ Practical: *(finances, transportation, accommodations), other:* _____
☐ Social/Emotional Support: *(anxiety, depression, body image, sexuality, personhood, fears, relationships) other:* _____
☐ Spiritual *(total pain; meaning/faith) other:* _____
☐ Advance Care Planning Conversations
☐ BC Palliative Care Drug Benefit Program Initiated
☐ DNR Obtained
☐ Other: _____
PPS (%) _____

Referrals Completed During Clinic Visit/Updates *(circle the word(s) that best describe the ticked referral/update)*
☐ Radiation or Medical Oncology Consultation
☐ Radiation or Medical Oncology Update
☐ Patient & Family Counselling
☐ Nutrition
☐ Physiotherapy or Occupational Therapy
☐ Respiratory Therapy
☐ Psychiatry
☐ GP Phone Call
☐ Nursing Referral/Update *(palliative, hospital, systemic, radiation) other:*
☐ Minimally Invasive Palliative Procedure *(epidural, block, cementoplasty) other:*
☐ Community Home Care Referral
☐ Community Home Care Update
☐ Hospital Admission _____
☐ Hospice Admission
☐ Other Referrals _____

☐ **No Pain** ☐ **Cancer Pain** *(if yes, complete ECS-CP)*
☐ **Cancer Treatment-Induced Pain** ☐ CIPN ☐ Post Surgical ☐ *other:* _____

Edmonton Classification System for Cancer Pain (ECS-CP) *(circle applicable 'cancer' pain pattern)*

Mechanism	**Nc** (nociceptive)	**Ne** (neuropathic)	**Nx** (unknown)	
Incident Pain	**Io** (no incident pattern)	**Ii** (incident pattern)		
Psychological Distress	**Po** (none)	**Pp** (present)	**Px** (unknown)	
Addictive Behaviour	**Ao** (none)	**Aa** (present)	**Ax** (unknown)	
Cognitive Function	**Co** (no impairment)	**Ci** (partial)	**Cu** (complete)	**Cx** (insufficient information)

Non-Cancer Pain
☐ PHN ☐ other neuropathic ☐ bone/joint ☐ myofascial ☐ other _____

Interventions
☐ No Interventions

Antidepressants
☐ tricyclic
☐ SSRI
☐ SNRI
☐ Other:
_____
_____
_____
_____

Non-Opioid Analgesics
☐ NSAID
☐ COX2 inhibitors
☐ acetaminophen

Opioid Analgesics
☐ weak opioid/ combination
☐ tramadol/tapentadol
☐ buprenorphine
☐ morphine
☐ hydromorphone
☐ oxycodone
☐ fentanyl patch
☐ methadone
☐ rapid onset opioid preparation

Other Drugs
☐ corticosteroid
☐ gastroprotection
☐ gabapentin/pregabalin
☐ other anticonvulsant
☐ lidocaine/mexiletine
☐ cannabinoid
☐ bisphosphonate
☐ antiemetic
☐ anxiolytic
☐ psychostimulant
☐ hypnotic *(sleeping pill)*
☐ ketamine

Topical Treatment
_____
_____
_____

Other Interventions
_____
_____
_____
_____
_____

Bowel Performance Scale _____
☐ unable to assess

Laxatives Upon Arrival in Clinic
☐ yes ☐ no *(specify):*
_____
_____
_____

Changes Made
☐ yes ☐ no *(specify):*
_____
_____
_____

DO NOT FILE IN CHART Revised: 29 July 2014

Page 2 of 2

significant difference between groups was a small reduction in the number of homecare service visits received by those who received home hospice support, of minimal clinical relevance.

Other studies have shown that documenting symptom severity does not lead to improvement in outcomes unless positive screens lead to change in management, preferably from a multidisciplinary team (Slama et al., 2020; Yount et al., 2014). A full multidisciplinary assessment followed by an ongoing relationship with an additional service takes time and energy. Embedding as much care as possible into the oncology clinics would seem easier for patients, but distressed patients may not have the capacity to get the full benefit of a referral if they are already overwhelmed. For these patients, a separate time for consultation may be preferred.

It is also possible that we did not measure the most relevant outcomes. Numerical scales do not identify individual goals for comfort, and people tend to prefer rating effects of symptoms on their ability to function in specific tasks (Gibbins et al., 2014). Minimal clinically important differences (MCID) in pain severity criteria result in over-estimation of response in groups with high pain intensity, and under-estimation of response in those with low pain intensity (Hui & Bruera, 2016). What may be acceptable to one person may be entirely unacceptable to another, and arbitrary triggers may not optimally capture needs for specialist support.

Our participants may also have been less likely to benefit than those in advanced cancer studies because of lower intensity of symptoms. A review of 644 screens from mixed cancer patients accrued from a group of US cancer centres (Funk et al., 2016) found that 23% reported a symptom score of 8/10 or higher, but 18% declined referral to supportive care, and only 61% of the remainder actually received a consultation. Of those seen once, only 19% completed one or more follow-up appointments. Similarly, a study of mixed Japanese cancer patients using a threshold for any one symptom of 5/10 or overall distress score of 6/10 resulted in half of the completed questionnaires meeting referral criteria. After oncologist review, only half of these were actually referred, a fifth of which the palliative care team was already involved in caring for (Morita et al., 2008; Morita et al., 2013). Symptom severity and complexity are not the same thing; complexity being much more difficult to identify. Bruera and colleagues recommend the ESASr to triage symptomatic patients but suggest review by the oncologist and further symptom assessment before referral (Bruera & Yennurajalingam, 2012). Though this adds more burden of assessment and management on the oncology teams, it allows for most efficient use of limited supportive care resources. Our study is consistent with these, in that participants in the intervention arm sometimes declined PSMPC referral, mostly because they did not feel they needed it. Eligible patients' most frequent reason for declining to participate in the study was being overwhelmed already, so the study may have effectively excluded those most likely to benefit. Potential benefits such as better understanding of the disease, coping, advance care planning, lower caregiver depression and stress were not assessed.

Patients with GI cancers may be less likely to be highly symptomatic as compared with other cancers previously demonstrated to benefit from integrated supportive/palliative care, such as advanced lung cancer. Progression of different cancers may also affect ability of interventions to effect change in outcomes over similar time periods, and follow-up may need to be longer to identify differences in outcomes in patients with less aggressive tumour types. Temel and colleagues (2017) compared early palliative care in patients with lung cancer and with GI cancer. The lung cohort had a significant benefit in terms of quality of life from the study intervention, but the GI cohort did not (Temel 2017) whereas those who received usual care consulted a PC clinician upon request. The primary end point was change in quality of life (QOL).

Study limitations

Limitations of the study include high attrition, missing data, and crossovers. Due to resource constraints, patients who were unable to speak English and did not have an available family member to translate were also excluded. High dropout rates have challenged other researchers in the same way as this study. Temel and colleagues (2020) reported failure to complete a well-funded, large multicentre study focused on early integration in advanced GI cancer patients. A similar study in advanced pancreatic cancer also did not reach its feasibility goals (Schenker et al., 2018). Completing trials in symptomatic cancer patient groups is challenging because of the rapidly changing medical status and a high burden of non-study treatments and investigations. Completing just a single-page form in the waiting room was overwhelming for many of our patients. Other ways to capture data are needed, such as online surveys completed at home, or telephone surveys conducted by skilled assessors.

In addition to some of the control group patients receiving a PSMPC referral, we were also not able to exclude cross-over effects, which could have further reduced our power to detect differences between the groups. Completing the PSMQ may have validated patients' or caregivers' concerns and made them more comfortable raising the concerns with the oncology team. Participating oncologists would have been aware that the quality of their palliative care practice was indirectly being assessed, and this may have increased their efforts to address patients' palliative care needs themselves. It is also noteworthy that palliative care knowledge and skills have been included, to at least a minimal extent, in most undergraduate and postgraduate medical curricula, and almost universally in oncology training programs. The participating oncologists in this study were a generally "palliative care-aware" team, with considerable skills in this area. Standard cancer care now includes at least primary level palliative care delivered by cancer care teams and family physicians.

CONCLUSION

Routine symptom screening is a promising means of identifying cancer patients with palliative care needs, but completion of symptom screening tools can be burdensome to patients at a time when they are already overwhelmed. Remote direct data entry by patients may be a better option than screening in busy oncology clinics. The details of what happens after a screening tool is administered needs to be carefully considered before implementation. Triaging by the oncology nurse is necessary to direct patients to the most appropriate supportive care service, or to deal with it themselves.

Though having symptom screening data is helpful for oncology teams to identify distressed patients, symptom-triggered specialist consultation is unlikely to make a substantially better impact on patient outcomes than management by a good oncology team with easy access to specialist palliative care support when needed.

DECLARATIONS

Funding statement

We would like to thank donors to the BC Cancer Foundation who enabled the Foundation to provide salary support for a research assistant to work on this study. No other funding was received.

Author Disclosure Statement

None of the authors have any conflicts of interest or competing interests related to this manuscript.

Availability of data and material

All original data is available on request.

Code availability

Not applicable

Author Contribution statement

Philippa Hawley conceived the study, wrote the protocol, supervised the research assistants, reviewed the results, and was the major contributor to writing the manuscript. Narsis Afghari carried out the statistical analysis, prepared the tables and figures, and assisted with editing the manuscript. Catherine Courteau reviewed the results and assisted with writing the manuscript.

Ethics approval

The trial was approved by the University of British Columbia Research Ethics Board and registered online with ClinicalTrials.gov [NCT02335619].

Consent for participation

All oncologists and patients consented to participate in the study.

Consent for publication

All authors consent to the publication of this paper.

Acknowledgments

Thanks to Lib Cooper RN, Zahra Lalani RN, and Mara Long for their work on this study, and to all the participating oncologists. Thanks also to Ms. Isabella Ghement for her statistical support.

REFERENCES

Antunes, B., Harding, R., & Higginson, I. J. (2014). Implementing patient-reported outcome measures in palliative care clinical practice: A systematic review of facilitators and barriers. *Palliat Med., 28*, 158–75. https://pubmed.ncbi.nlm.nih.gov/23801463/

Azizabadi, F. M., & Assari, S. (2010). Relationship between pain and auality of life. *Handbook of Disease Burdens and Quality of Life Measures*. Springer. 3933–53. http://dx.doi.org/10.1007/978-0-387-78665-0_229

Barbera, L., Seow, H., Howell, D., Sutradhar, R., Earle, C., Liu, Y., et al. (2010). Symptom burden and performance status in a population-based cohort of ambulatory cancer patients. *Cancer, 116*(24), 5767–76. https://pubmed.ncbi.nlm.nih.gov/21136579/

Bischoff, K., Weinberg, V., & Rabow, M. W. (2013). Palliative and oncologic co-management: Symptom management for outpatients with cancer. *Support Care Cancer,* (11), 3031–7. https://pubmed.ncbi.nlm.nih.gov/23794100/

Blackhall, L. J., Read, P., Stukenborg, G., Dillon, P., Barclay, J., Romano, A., et al. (2016). CARE track for advanced cancer: Impact and timing of an outpatient palliative care clinic. *J Palliat Med. 19*(1), 57–63. https://pubmed.ncbi.nlm.nih.gov/26624851/

Bruera, E., & Yennurajalingam, S. (2012). Palliative care in advanced cancer patients: how and when? *Oncologist, 17*(2), 267–73. https://pubmed.ncbi.nlm.nih.gov/22252934

Burt, M., & Kamal, A. H. (2018). Practical strategies for optimizing and integrating palliative care in cancer. *Current Oncology Reports,* Vol. 20. Current Medicine Group LLC 1. https://pubmed.ncbi.nlm.nih.gov/30421161/

Chang, V. T., Hwang, S. S., & Feuerman. M. (2000), Validation of the Edmonton Symptom Assessment Scale. *Cancer, 88*(9), 2164–71. http://dx.doi.org/10.1002/(sici)1097-0142(20000501)88:9%3C2164::aid-cncr24%3E3.0.co

Courteau, C., Chaput, G., Musgrave, L., & Khadoury, A. (2018). Patients with advanced cancer: When, why, and how to refer to palliative care services. *Curr Oncol, 25*(6), 403–8. https://pubmed.ncbi.nlm.nih.gov/30607115

Etkind, S. N., Daveson, B. A., Kwok, W., Witt, J., Bausewein, C., Higginson, I. J. et al. (2015). Capture, transfer, and feedback of patient-centered outcomes data in palliative care populations: Does it make a difference? A systematic review. *Journal of Pain and Symptom, 49*, 611–24. https://pubmed.ncbi.nlm.nih.gov/25135657/

Fadhlaoui, A., Mrad, H., Vinette, B., & Bilodeau, K. (2022). The early integration of palliative care into oncology care: A rapid review. *Canadian Oncology Nursing Journal, 32*(4), 2368–8076. https://doi.org/10.5737/23688076324505

Ferrell, B., Sun, V., Hurria, A., Cristea, M., Raz, D. J., Kim, J. Y., et al. (2015). Interdisciplinary palliative care for patients with lung cancer. *J Pain Symptom Manage, 50*(6), 758–67. https://pubmed.ncbi.nlm.nih.gov/26296261/

Funk, R., Cisneros, C., Williams, R. C., Kendall, J., & Hamann, H. A. (2016). What happens after distress screening? Patterns of supportive care service utilization among oncology patients identified through a systematic screening protocol. *Support Care Cancer, 24*(7), 2861–8. https://pubmed.ncbi.nlm.nih.gov/26838023/

Gibbins, J., Bhatia, R., Forbes, K., & Reid, C. M. (2014). What do patients with advanced incurable cancer want from the management of their pain? A qualitative study. *Palliat Med, 28*(1), 71–8. https://pubmed.ncbi.nlm.nih.gov/23670721/

Goel, M. K., Khanna, P., & Kishore, J. (2010). Understanding survival analysis: Kaplan-Meier estimate. *Int J Ayurveda Res, 1*(4), 274–8. https://pubmed.ncbi.nlm.nih.gov/21455458

Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of Multiple Imputation Theory. *Prev Sci, 8*(3), 206–13. http://dx.doi.org/10.1007/s11121-007-0070-9

Hawley, P. H. (2014). The bow tie model of 21st Century palliative care. *J Pain Symptom Manage, 47*(1), e2–5. http://dx.doi.org/10.1016/j.jpainsymman.2013.10.009

Hemming, K., Girling, A. J., Sitch, A. J., Marsh, J., & Lilford, R. J. (2011). Sample size calculations for cluster randomised controlled trials with a fixed number of clusters. *BMC Med Res Methodol, 11*, 102. https://pubmed.ncbi.nlm.nih.gov/21718530

Hui, D., & Bruera, E. (2015). Models of integration of oncology and palliative care. *Ann Palliat Med, 4*, 89–98. https://pubmed.ncbi.nlm.nih.gov/26231806/

Hui, D., & Bruera, E. (2016). The Edmonton Symptom Assessment System 25 years later: Past, present, and future developments. *J Pain Symptom Manage, 53*(3), 630–43. https://pubmed.ncbi.nlm.nih.gov/28042071

Hui, D., Kim, S. H., Roquemore, J., Dev, R., Chisholm, G., & Bruera, E. (2014). Impact of timing and setting of palliative care referral on quality of end-of-life care in cancer patients. *Cancer, 120*(11), 1743–9. /pmc/articles/PMC4073257/?report=abstract

Hui, D., Shamieh, O., Paiva, C. E., Khamash, O., Perez-Cruz, P. E., Kwon, J. H., et al. (2016). Minimal clinically important difference in the physical, emotional, and total symptom distress scores of the Edmonton Symptom Assessment System. *J Pain Symptom Manage, 51*(2), 262–9. https://pubmed.ncbi.nlm.nih.gov/26482223

Hui, D., Shamieh, O., Paiva, C. E., Perez-Cruz, P. E., Kwon, J. H., Muckaden, M. A. et al. (2015). Minimal clinically important differences in the Edmonton Symptom Assessment Scale in cancer patients: A prospective, multicenter study. *Cancer, 121*(17), 3027–35. https://pubmed.ncbi.nlm.nih.gov/26059846/

Jang, R. W., Krzyzanowska, M. K., Zimmermann, C., Taback, N., & Alibhai, S. M. H. (2015). Palliative care and the aggressiveness of end-of-life care in patients with advanced pancreatic cancer. In: *Journal of the National Cancer Institute*. Oxford University Press. https://pubmed.ncbi.nlm.nih.gov/25609233/

Kim, Y., Yen, I. H., & Rabow, M. W. (2016). Comparing symptom burden in patients with metastatic and nonmetastatic cancer. *J Palliat Med, 19*(1), 64–8. https://pubmed.ncbi.nlm.nih.gov/22663083/

May, P., Garrido, M. M., Cassel, J. B., Kelley, A. S., Meier, D. E., Normand, C., et al. (2015). Prospective cohort study of hospital palliative care teams for in-patients with advanced cancer: Earlier consultation is associated with larger cost-saving effect. *J Clin Oncol, 33*(25), 2745–52. https://pubmed.ncbi.nlm.nih.gov/26056178/

Morita, T., Fujimoto, K., Namba, M., Sasaki, N., Ito, T., Yamada, C., et al. (2008). Palliative care needs of cancer outpatients receiving chemotherapy: An audit of a clinical screening project. *Support Care Cancer, 16*(1), 101–7. https://pubmed.ncbi.nlm.nih.gov/17611783/

Morita, T., Sato, K., Miyashita, M., Akiyama, M., Kato, M., Kawagoe, S., Kinoshita, H., et al. (2013). Exploring the perceived changes and the reasons why expected outcomes were not obtained in individual levels in a successful regional palliative care intervention trial: An analysis for interpretation. *Support Care Cancer, 21*, 3393–3402.

Myers, W. R. (2000). Handling missing data in clinical trials: An overview. *Drug Inf J., 34*(2), 525–33. http://dx.doi.org/10.1177/009286150003400221

National Cancer Institute. (2000). *NCI Dictionary of Cancer Terms* - National Cancer Institute. https://www.cancer.gov/publications/dictionaries/cancer-terms/expand/A [cited 2000, Dec 21]

R-3.4.3 for Windows (32/64 bit) (2017). https://cran.r-project.org/bin/windows/base/old/3.4.3/

Rombach, I., Rivero-Arias, O., Gray, A. M., Jenkinson, C., & Burke, Ó. (2016). The current practice of handling and reporting missing outcome data in eight widely used PROMs in RCT publications: A review of the current literature. *Qual Life Res, 25*(7), 1613–23. https://pubmed.ncbi.nlm.nih.gov/26821918

Schenker, Y., Bahary, N., Claxton, R., Childers, J., Chu, E., Kavalieratos, D., et al. (2018). A pilot trial of early specialty palliative care for patients with advanced pancreatic cancer: Challenges encountered and lessons learned. *J Palliat Med, 21*(1), 28–36. https://pubmed.ncbi.nlm.nih.gov/28772092/

Schenker, Y., Crowley-Matoka, M., Dohan, D., Rabow, M. W., Smith, C. B., White, D. B. et al. (2014). Oncologist factors that influence referrals to subspecialty palliative care clinics. *J Oncol Pract, 10*(2). https://pubmed.ncbi.nlm.nih.gov/24301842/

Schneider, A., Hommel, G., & Blettner, M. (2010). Linear regression analysis: Part 14 of a series on evaluation of scientific publications. *Dtsch Arztebl Int, 107*(44), 776–82. https://pubmed.ncbi.nlm.nih.gov/21116397

Slama, O., Pochop, L., Sedo, J., Svancara, J., Sedova, P., Svetlakova, L. et al. (2020). Effects of early and systematic integration of specialist palliative care in patients with advanced cancer: Randomized controlled Trial PALINT. *J Palliat Med, 12*; 1586–1593. https://pubmed.ncbi.nlm.nih.gov/32391740/

Sperandei, S. (2014). Understanding logistic regression analysis. *Biochem medica, 24*(1), 12–8. https://pubmed.ncbi.nlm.nih.gov/24627710

Temel, J. S., Greer, J. A., El-Jawahri, A., Pirl, W. F., Park, E. R., Jackson, V. A., et al. (2017). Effects of early integrated palliative care in patients with lung and GI cancer: A randomized clinical trial. *J Clin Oncol, 35*(8), 834–41. https://pubmed.ncbi.nlm.nih.gov/28029308/

Temel, J. S., Sloan, J., Zemla, T., Greer, J. A., Jackson, V. A., El-Jawahri, A. et al. (2020). Multisite, randomized trial of early integrated palliative and oncology care in patients with advanced lung and gastrointestinal cancer: Alliance A221303. *J Palliat Med, 23*(7), 922–9. https://pubmed.ncbi.nlm.nih.gov/32031887/

Torgerson, D. J. (2001). Contamination in trials: Is cluster randomisation the answer? *BMJ, 322*(7282), 355–7. https://pubmed.ncbi.nlm.nih.gov/11159665

Vanbutsele, G., Van Belle, S., Surmont, V., De Laat, M., Colman, R., Eecloo, K., et al. (2018). Effect of early and systematic integration of palliative care in patients with advanced cancer: A randomised controlled trial. *Lancet Oncol, S1470-2045*(18), 30060-3.

Walling, A. M., Tiznado, D., Asch, S., Malin, J., Pantoja, P., Sydney, M., et al. (2013). The quality of supportive cancer care in the Veterans Affairs Health System and targets for improvement. *JAMA Intern Med, 173*(22), 2071–9. https://doi.org/10.1001/jamainternmed.2013.10797

Wentlandt, K., Krzyzanowska, M. K., Swami, N., Rodin, G. M., Le, L. W., & Zimmermann, C. (2012). Referral practices of oncologists to specialized palliative care. *J Clin Oncol, 30*(35), 4380–6. https://pubmed.ncbi.nlm.nih.gov/23109708/

Woo, A., Lechner, B., Fu, T., Wong, C. S., Chiu, N., Lam, H., et al. (2015). Cut points for mild, moderate, and severe pain among cancer and non-cancer patients: A literature review. *Ann Palliat Med, 4*(4), 176–83. http://apm.amegroups.com/article/view/7959/8893

World Health Organization. *2018 Working Definition of Palliative Care*. https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/Government-Relations/Palliative-Care-Agenda-and-Minutes/2018-Working-Def-of-Palliative-Care.pdf

Xiao, C., Polomano, R., & Bruner, D. W. (2013). Comparison between patient-reported and clinician-observed symptoms in oncology. *Cancer Nurs., 36*(6), E1–E16. https://doi.org/10.1097/NCC.0b013e318269040f. PMID: 23047799.19

Yount, S. E., Rothrock, N., Bass, M., Beaumont, J. L., Pach, D., Lad, T., et al. (2014). A randomized trial of weekly symptom telemonitoring in advanced lung cancer. *J Pain Symptom Manage, 47*(6), 973–89. https://pubmed.ncbi.nlm.nih.gov/24210705/

Zimmermann, C., Swami, N., Krzyzanowska, M., Hannon, B., Leighl, N., Oza, A., et al. (2014). Early palliative care for patients with advanced cancer: A cluster-randomised controlled trial. *Lancet, 383*(9930), 1721–30. http://dx.doi.org/10.1016/s0140-6736(13)62416-2