Refining a checklist for reporting patient populations and service characteristics in palliative care research

David C. Currow BMed, MPH, FRACP[1]
Jennifer J. Tieman BSc, MBA[1]
Aine Greene FRCNA[1]
S. Yousuf Zafar MD, MHS[2]
Jane L. Wheeler MSPH [2]
Amy P. Abernethy MD[1,2]

Affiliations

[1]Discipline, Palliative and Supportive Services, Flinders University, Adelaide, Australia

[2]Division of Medical Oncology, Department of Medicine, Duke University Medical Centre, Durham, North Carolina, USA

Corresponding Author:

David C. Currow
Discipline, Palliative and Supportive Services
Flinders University, Bedford Park
South Australia. Australia. 5042
p - +61 8 7221 8235
f - +61 8 7221 8208
david.currow@flinders.edu.au

Word count (including references, excluding abstract, tables and figure) 2590
References 22
Tables 5

Abstract

Context and Objective
Diagnoses and prognoses vary widely across sub-populations of people referred to specialist palliative care services; variations also exist in the way these services are configured. These variations create substantial heterogeneity in palliative care populations enrolled in research studies which, in turn, limits the generalizability of study results. This paper reports on the refinement of a checklist of patient/research participant and service/research site descriptors; the checklist can be completed for any palliative care research study. Its purposes are to: (1) facilitate the design and reporting of rigorous palliative care research, and thereby, (2) aid clinicians in appropriately applying research evidence in clinical practice.

Methods
A previously published framework (five domains; 13 core sub-domains and 25 non-core sub-domains) was used to code all research articles (n=189) published over a 12-month period in the three leading palliative care journals internationally.

Results
In descending order, the most frequently reported sub-domains were: *patient age*, *patient gender* and *patient diagnosis*; *model of service delivery and patient performance status*. Data in certain sub-domains, such as *time from referral to death*, *socio-economic indices* and *ethnicity,* were rarely reported; none of the included studies reported *whole-of-service* or *whole-of-population* data. With a total of 2,457 core sub-domains that could have been reported (189x13), the included studies provided data on 30% (746/2457).

A simplified list of sub-domains is proposed. Different domains are now identified for different study populations in palliative care.

Conclusion
Checklists such as CONSORT focus mainly on internal validity. The proposed checklist adds a checklist specific to the content of palliative care, focusing on external validity and the study population.

Key words: study characteristics; reporting guidelines; publishing/standards; quality controls; checklists; applicability; generalisability

Running Title: Reporting palliative care trials

Introduction

A central task of evidence-based practice is to apply research-generated evidence to a patient.[1,2] A central responsibility of researchers, therefore, is to describe the generalizability of their research in a way that helps clinicians determine whether, and under what circumstances, the findings can be applied to their patients.

Generalizability of a research study's findings (also termed external validity) defines whether or not the findings will hold for all settings beyond that of the study itself. Applicability refers to whether or not the results will hold if applied in a particular setting. Generalizability is therefore a property of the study, whereas applicability is determined by the way in which a clinician uses its results. In disciplines where research populations or the services from which patients are recruited differ widely, generalizability may be limited. Palliative care is one such discipline; two palliative care services, even in the same health system, can vary widely in their patient populations and in their models of service provision. These divergences can create very different sub-populations of study participants, even in rigorously designed and executed randomised controlled trials, [3,4] and can limit the generalizability of reported evidence.[5]

Palliative care is not unique in struggling to report key elements of study design, so as to facilitate the application of research findings in practice. In oncology, a recent review of randomized, controlled trials of best supportive care interventions found that only 11% of such studies published from 2005 to 2008 reported all data elements essential to translation of oncology clinical trial data into clinical practice.[6] These elements included drug name, dose, route, cycle length, patient monitoring parameters, and dosing adjustments for toxicity. Reporting is even less rigorous for trials where patients are randomized to either cancer treatment or "best supportive care."[7,8]

Lack of standardized reporting of study design elements can give rise to situations in which data derived from the study of one sub-population are used erroneously to inform decisions about a different sub-population. In a meta-analysis of 141 trials, Dhruva and Redberg found that participants in cardiovascular studies used by the Centers for Medicare and Medicaid Services (CMS) for coverage determinations differed substantially from the Medicare population to which those coverage decisions would apply.[9] Another study of publications in high-impact general medical journals found that exclusion criteria defining the populations of randomized controlled trials are often not clearly reported or justified, impairing the applicability of the results more broadly.[10] Such differences between the study population and a population in which results are applied will likely be more pronounced in palliative care due to the heterogeneity of its sub-populations and settings.

Method- or design-specific checklists have been developed to explore the internal validity of studies. Examples include: CONSORT (Consolidated Standards of Reporting Trials) for randomized clinical trials; [11] STROBE (STrengthening the Reporting of OBservational Studies in Epidemiology), which pertains to case-control, cohort, and cross-sectional studies; [12] AGREE (Appraisal of Guidelines for Research and Evaluation), for assessing the quality of observational studies; [13] QUORUM (Quality of Reporting of Meta-Analyses);[14] MOOSE (Meta-Analysis of

Observational Studies in Epidemiology); [15] and STARD (Standards for Reporting of Diagnostic Accuracy) for diagnostic studies.[16]

To complement the checklists above, given the variations in its populations and service models, palliative care research needs a discipline-specific checklist to evaluate external validity. This research group previously proposed a supportive and palliative care discipline-specific checklist; [5] the checklist comprises a small number of easily documented and understood measures, selected to reflect key variation between service delivery models and the populations referred to those clinical services. By assessing applicability based on service and patient population descriptors, use of this checklist should help in describing and comparing supportive and palliative care studies in the future, and should allow more rapid and appropriate uptake of new evidence into practice.

The aim of this paper is to: (1) quantify the reporting of study populations and health services in the supportive and palliative care-specific literature; and (2) refine the descriptors in the checklist based on these data.

Methods

A literature search was conducted using a previously validated Ovid Medline filter for palliative care. All articles indexed in the *Journal of Pain and Symptom Management*, *Palliative Medicine* and *Journal of Palliative Medicine* were included; these three leading palliative care scientific journals were chosen because they have the highest annual clinical trial publication rates in the discipline.[17,18]

Journals were searched for 2007 to accommodate any time lag in electronic bibliographic indexing. Inclusion criteria were; published articles reporting all empirically-based studies, including controlled trials, cohort studies, cross-sectional studies and qualitative studies. A letter was eligible for inclusion if it reported new results. Articles were excluded if they were: other letters to the editor, editorials, commentaries, comments, fast facts, patient hand-outs, case reviews, case discussions, descriptive studies, consensus statements and systematic reviews.

Each search comprised the palliative care filter (Ovid Medline syntax) limited to the journal and the year 2007.[18] Searches were conducted on November 12 and 13, 2008. Retrieved articles were downloaded into an Endnote Library (Thomson Reuters Endnote X1 for Windows. New York, USA. 2007). Citations and abstracts were placed into a Microsoft Excel spreadsheet. (Office Windows 97. Microsoft Corporation. Seattle, USA. 1997). The order of these entries was randomized to ensure that papers from each journal were not reviewed consecutively.

Eligibility of identified papers was confirmed through abstract review. All papers were coded by one investigator (AG) using the framework. [5] One in ten papers was coded independently by a second investigator (DC). Any discrepancies were settled by consensus.

The framework comprises five domains divided into 38 sub-domains. Sub-domains were categorised as core (essential for generalisability; n=13) and non-core (may aid

generalisability by supporting a better understanding of the population/setting in which the study was conducted; n=25).

Data are reported by: number of fields available compared to number of fields into which data could be coded; rates of reporting core and non-core data items; most frequently and least frequently coded data items; and whether papers were published in their country of origin.

Results

The search identified 409 citations: of these, 189 papers (47%) were included (Table 1). The proportion of identified papers included for each journal was: *Journal of Pain and Symptom Management,* 47% (51/113); *Palliative Medicine*, 58% (66/115); and *Journal of Palliative Medicine,* 40% (72/181).

In the *patients and caregivers* domain, articles provided data only for people participating in the study; no article provided data for people referred to the service, nor for the total population of people with life-limiting illnesses from whom the service population was drawn. Hence all data subsequently reported herein refer only to study participants.

There were a total of 7,182 fields (189x38) into which data could be coded for the population and services in the studies. Data were available for only 1129 of these fields (15.7%). For 13 core items across 189 papers (189x13=2,457 fields), this percentage rose to 30.4% (746/2,457; Table 2).

The percentage of possible fields that could have a response coded for each core and non-core sub-domain was tabulated. Articles were 3.5 times more likely to provide data for core sub-domains than for non-core sub-domains. Only 11 papers failed to report any core data items; none of these reported studies of patients.

Three domains (*patient and caregiver factors*; *research factors*; and *service factors*) accounted for the 10 most frequently reported sub-domains. All sub-domains were able to be coded from sub-sets of papers. In descending order, the most frequently reported sub-domains were: *patient age*, *patient gender* and *patient diagnosis*; *model of service delivery*; and *patient performance status*. (Table 3) Rarely reported sub-domains included *socio-economic indices*, *ethnicity*, and *time from referral to death*.

The pattern of data provision in the most and least frequently reported sub-domains was examined in relation to whether the checklist [5] labelled them “core” or ”non-core.” Only one non-core item (*primary data source*) appeared in the 10 sub-domains that were most frequently reported. No core items appeared in the 10 least frequently reported sub-domains. The poorest performing core sub-domain was in the domain, *research factors*: “primary outcome measure validated for use in palliative care populations.”

In reviewing the research reported in the palliative care literature, it also became apparent that more emphasis should be placed on the participant population. Participant populations included patients, caregivers, health professionals, healthy

volunteers and the community more broadly. Each of these groups warrants a tailored version of the checklist. A proposed set of the core domains relating to different study populations was also developed. (Table 4)

In response to these findings, the core sub-domains were simplified. (Table 5) The only sub-domain that deals with internal validity (*Has the primary outcome measure been validated in a palliative care population?*) was retained.

Discussion

In a representative cross-section of the palliative and supportive care literature, patterns of reporting factors relevant to generalizability were examined. Results suggest that it is feasible to report standard study descriptors which can aid with evaluation of generalizability in supportive and palliative care, but that reporting these factors is incomplete.

Results of the literature search showed significant under-reporting of information that is necessary in order for clinicians and health planners to assess the applicability of palliative care study findings to their patients or services. No paper covered all core sub-domains: in the best case, nine out of 13 were included. Reporting of *patient factors* was better than that of other domains, but even basic patient demographic factors such as participants' ages and genders were not reported universally. Given wide local differences in the people referred to, and the structure of, palliative care services, the poor reporting of basic descriptive factors can be expected to impede the application of newly found knowledge in this field. [4]

Representing an intersection between oncology and palliative care practice, best supportive care studies can be viewed as a subset of palliative care research. Best supportive care trials should include a coherent description of the care offered including assessments undertaken, their schedule and the supports offered. *Ad hoc* provision of supportive care, without meticulous documentation of what that care actually entails, is likely to introduce systematic bias into the interpretation of trial results; there is potential for inflation of the apparent benefit of the oncological intervention.[8] The checklist proposed in this paper may help in the design and reporting of oncology trials where best supportive care is used as a comparator.

The proposed model bears a structural resemblance to the Center to Advance Palliative Care (CAPC) Consensus Recommendations, Operational Features for Hospital Palliative Care Programs, which was developed to define specific features necessary for program sustainability and growth and to help guide hospitals as they start new or strengthen existing palliative care programs.[19] The CAPC framework divides 12 operational domains into "must have" and "should have" recommendations, similar to the "core" and "non-core" items in this checklist. The operational factors in the CAPC recommendations overlap with some of the items in this framework's *service factors* domain. These independently developed frameworks can both contribute to the better application of evidence into practice and policy.

Ideally, to aid readers in interpreting study results and evaluating study generalizability, each journal article reporting new palliative care research would provide a checklist of the core sub-domains relevant to the study population. Routine use of this checklist might also: facilitate systematic comparison between those people with advanced disease who are and who are not referred to specialised palliative care services; build a better understanding of when findings from one population (e.g., palliative cancer care) can or cannot be extrapolated to another population (e.g., palliative care in end-stage respiratory failure); encourage more rigorous study design, which in turn might increase the clinical applicability of studies and expedite synthesis of data into systematic reviews and meta-analyses.

Limitations of this study

The development of a framework for generalizability/applicability of best supportive and palliative care is evolving work. The model was refined based on results of the current study. Similarly, CONSORT and other reporting frameworks have been works in progress over many years with the models evolving as new data are analysed. [20]

The dataset for this study did not include systematic reviews. It is likely that systematic reviews need to reflect the designs of studies they include, and hence an aggregated field such as service or health system descriptors may be difficult to report. If studies are reported using the suggested checklist, this approach may simplify the task of authors of future systematic reviews, allowing them to more easily synthesise and present the myriad data which they aggregate.

Applying this checklist

Using the checklist in designing and reporting study results – researchers

1. Identify the study question.
2. Choose a reporting framework for that methodology. (see *Introduction*, paragraph 5)
3. Identify the participant population. (Table 4)
4. Ensure that the core sub-domains (Table 5) for that patient population are reported in the *Results* section of the paper.

Using the checklist in reading study results – clinicians and policy-makers

1. Read the *Introduction* of the research publication, and frame the study question in your own words.
2. Identify the best methodology to answer the question. Have the researchers used this methodology? Have they reported their methodology against a standard reporting framework? (e.g., CONSORT; see Introduction, paragraph 5)
3. Identify the population of participants in the study and hence the core sub-domains that need to be reported. (Table 5)
4. Look for each of the core sub-domains in the *Methods* and *Results* section of the paper.
5. Define the same core sub-domains for your own clinical practice.

6. Compare the characteristics of the study's core sub-domains with those of the service in which you work. If there are major differences in any of the reported parameters between the study and your practice, consider how best to adapt the research findings, or decide that they cannot be applied in your practice because the differences are too significant.

Future research

The data presented cannot answer the question of whether this framework will result in a timelier uptake of new and emerging evidence into practice.

Further study would be required to;
1) quantify the impact of poor study reporting on applying research findings in palliative care i.e. define the current evidence/practice gap;
2) do a feasibility/acceptability study of use of the checklist (to determine whether, in its current state, people would use it);
3) assess its validity;
4) do a rigorous study on whether the use of this checklist helps in transfer of knowledge

Future work – implications for policy and practice

This checklist has two audiences, both of whom need basic appraisal skills to optimise its use – researchers generating new knowledge, and end-users (clinicians and policy makers) seeking to apply that new knowledge. This checklist provides a pragmatic tool that can aid interpretation of studies; it may be especially useful to the large number of practitioners whose training pre-dates the routine teaching of critical appraisal of the medical literature. Its routine use could help provide structure to study parameters, allow readers to more rapidly evaluate new knowledge, and thereby facilitate the appropriate application of research evidence in clinical practice.

Disclosures: All authors declare that they have no competing interests

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Table 1: Included and excluded papers in the study The three international palliative care journals with the highest number of palliative care research studies 2007.

		Journals				
		Palliative Medicine	**Journal of Pain and Symptom Management**	**Journal of Palliative Medicine**	***Sub-total***	**Total**
Papers initially identified		**115**	**113**	**181**		**409**
Reason papers excluded	Duplicate from search strategy	10	2	3	***15***	
	Letter to the editor	23	11	11	***45***	
	Editorials, commentaries	5	7	28	***40***	
	Systematic reviews	4	3	2	***9***	
	Descriptive papers	7	33	50	***90***	
	Chart audit	0	2	0	***2***	
	Fast facts, patient information sheets	0	0	12	***12***	
	Consensus statements	0	4	3	***7***	
	Sub-total papers excluded	***49***	***62***	***109***		***220***
Papers included in final analysis		**66**	**51**	**72**		**189**

Table 2: Reporting of generalizability data items in original research in the three top ranked palliative care journals in 2007

Core / non-core data items	Domains	Potential number of fields captured	Mean number of responses by article for the domain (SD)	Median (range)	Percentage of possible fields with response
	ALL CORE	13	3.96 (2.01)	4 (0-9)	30.4
Core	Patient and caregiver characteristics*	8	3.85 (1.51)	4 (0-8)	48.1
	Professional issues	1	0.12(0.32)	0 (0-1)	11.5
	Best supportive and palliative care service descriptors	2	0.43(0.52)	0 (0-2)	21.5
	Health and social service descriptors**	1	0.15 (0.36)	0 (0-1)	15.2
	Characteristics of the research	1	0.05 (0.21)	0 (0-1)	4.7
Non-core	Patient and caregiver characteristics*	9	0.15 (0.36)	0 (0-1)	8.4
	Professional issues	3	0.13 (0.42)	0 (0-3)	4.3
	Best supportive and palliative care service descriptors	8	0.09 (0.39)	0 (0-3)	1.1
	Health and social service descriptors**	2	0.05 (0.21)	0 (0-1)	2.4
	Characteristics of the research	3	1.12 (0.57)	1 (0-3)	37.2
	ALL NON-CORE	25	2.05 (1.43)	2 (0-7)	25.1

*Using the denominator of 108 studies that directly studied patients.

* *Excludes 94 studies published in the country of origin where such a description is arguably superfluous. (n=97)

Table 3: The performance of all 13 core data items in original research in the three top ranked palliative care journals in 2007

Domain		Sub-domain	Classification examples	Percentage of studies reporting these data
Patient and caregiver	Patient – demographic	Age		**91.7***
		Gender		**88.9***
		Socio-economic indices		**32.4***
		Ethnicity		**25.9***
	Patient – clinical	Life-limiting illness		**73.1***
		Performance status		**39.8***
		Time from referral until death		**21.3***
	Caregiver	Percentage of people with no identifiable caregiver		**11.1***
Professional		Recognised specialty in the country where the study was done		**7.4**
Best supportive and palliative care service issues		Model of service delivery	Inpatient care, community care, consultative care, all of these	**41.7**
		Basis for referral	Diagnosis, prognosis, needs-based care	**0.9**
Health and social policy		Funding mechanisms for health care	User pays, universal insurance, combination	**14.1****
Research		Outcome measures used in the study validated in the palliative care population		**6.5***

*Using the denominator of 108 studies that directly studied patients

* *Excludes 94 studies published in the country of origin where such a description is arguably superfluous. (n=97)

Table 4: Delineation of fields that is pivotal to applying findings from different types of research in best supportive care and hospice research to the local environment. This accounts for the intent of the study and the intent of the potential application.

		Domain				
		Individual participant's demographics*	Caregiver*	Service		
				Clinical population referred	Descriptors	Funding
Study type	Healthy volunteer	X				
	Efficacy randomised controlled trial (RCT)	X		X		
	Other clinical intervention trials including effectiveness RCTs	X		X	X	X
	Health services research (including intervention trials)	X	X	X	X	X
	Cohort studies	X	+/-	X	X	X
	Qualitative	X		X	+/-	+/-
	Best supportive care as a comparator arm	X	X	X	X	X

* Should include a comparison between potential referrals to the service, those referred to the service and, as outlined in this table, those included in the study.

Table 5: Revised core checklist to improve the ability of clinicians and service planners to apply best supportive care or hospice research to their setting.

	Domain	Sub-domain		Measure	Population...	
					reported in this study	in my service
Generalizability - external validity / internal validity	Individual participant's demographics	Age		Mean (standard deviation SD)		
		Gender		Percentage		
		Socio-economic indices		A nationally accepted index		
		Ethnicity		Country-specific percentage highlighting groups with known poorer access and poorer outcomes		
	Caregiver#	Caregiver availability		Percentage of people with life limiting illnesses without an identified caregiver		
	Service	Clinical population referred	Life-limiting illness	Cancer / non-cancer		
			Performance status	AKPS* or ECOG**		
			Time from referral until death	Mean (SD), median (range)		
		Descriptors	Setting of study	Inpatient, community, outpatient, combination		
			Basis for referral	Prognosis +/- diagnosis +/- needs		
	Health and social policy	Health care funding mechanisms		Universal coverage, user pays etc		
	Research	Primary outcome measure in study		Outcome measures validated in palliative care populations	**Yes / No**	

Only applicable in studies of caregivers or in health service delivery trials
*Australian Modified Karnofsky Performance Status [21]
** Eastern Cooperative Oncology Group functional status [22]