

Peer Review File

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Round 1

Reviewer A

Comment 1: This is a very interesting review, with many important data collected. Different types of interventions were observed and mapping the study measures identified onto the Kirkpatrick Training Evaluation Model was a great idea!

Reply 1: Thank you for your comments.

Comment 2: The tables are very informative, but although the authors mentioned that they did not make a synthesis of outcomes, I think this information would be very important to demonstrate the effectiveness of palliative care education in these interventions and should be included in this paper.

Reply 2: In a separate systematic review, currently in press, we synthesized the overall outcomes and reported the effectiveness of the education interventions among published studies. We felt that reporting both on the effectiveness of these interventions and an in-depth analysis of the outcome measures was beyond the reach of a single paper. In addition, we used different search strategies to address these two different objectives. In the current review, we included protocols of studies yet to be completed and therefore have no outcomes reported. We now state in the Introduction section that we reported on the effectiveness of included published studies in a prior review.

Changes in the text: See page 6, lines 94-99. [All Mark-Up/Track Change version with line strike-outs shown]

Reviewer B

Abstract

Comment 1: First sentence – do patients have to be seriously ill to be offered a palliative care approach? I feel this excludes people with chronic progressive terminal conditions such as advanced dementia, who may not be “seriously ill”

Reply 1: We have removed “seriously ill” from this statement and replaced with “progressive and life-limiting”.

Changes in the text: See page 4, line 51. [All Mark-Up/Track Change version with line strike-outs shown]

Background

Comment 2: Page 2 lines 78-81 – I found these statements confusing, and further explanation is needed to highlight how your review was different to the review conducted by Teno et al 2017. Perhaps include an explanation of “specialised palliative care”, did they target specific patient groups, aspects of care or HCP groups?

Reply 2: We have changed the wording to clarify how our review was different from those mentioned, that is, that the Teno review and others focused on palliative care program outcomes, which is different from outcome measures used to evaluate palliative care training interventions. As suggested, we have also added an example of “specialized palliative care” to

provide context.

Changes in the text: See page 7, lines 112-117 and page 6, line 104.

Comment 3: (a) Non-palliative care specialists – was this the target group for the studies you included? If so, I noticed some of the included studies were for palliative care HCPs such as the study by Catania et al. Several included studies are targeted at oncologists – (b) I noticed there are already SR covering this HCP group.

For example:

Fischer, F., Helmer, S., Rogge, A. et al. Outcomes and outcome measures used in evaluation of communication training in oncology – a systematic literature review, an expert workshop, and recommendations for future research. BMC Cancer 19, 808 (2019). <https://doi.org/10.1186/s12885-019-6022-5>

Reply 3: (a) Our review indeed focuses on health care professionals other than palliative care specialists. The Catania protocol states that the staff had prior palliative care education, however, they are not identified as palliative care specialists and the intensity of the education intervention proposed suggests that they are not formally trained in this care, i.e., do not have former medical credentials in this care specialty. **(b)** To our knowledge, there are no other reviews that focus on outcomes for palliative care training interventions. The Fischer review focuses on communication training relevant to all stages of cancer, not just advanced cancer.

Changes in the text: None

Materials and Methods

Comment 4: There is no quality / risk of bias measures used in the systematic review. This will need explanation.

Reply 4: We report the effectiveness of the education interventions for the published studies in a prior review, currently in press, where we do conduct a risk of bias assessment. In the current review, we included *protocols* of studies yet to be completed and therefore have no outcomes reported on which to assess risk of bias. To address your comment, we now state in the Material and Methods – Data Extraction and Analysis section that we reported on the risk of bias of the published studies in a prior review.

Changes in text: Page 11, lines 207-210.

Comment 5: Please label your tables.

Reply 5: For Tables 1a. and 1b., we moved the title to the top of the document for the reader's ease.

Changes in text: See Table 1a. and 1b., row 1.

Comment 6: Line 92-93: The aim is missing the term palliative care – worth adding for completeness.

Reply 6: We have added the term palliative care to this statement.

Changes in the text: See page 8, line 133.

Comment 7: Please specify the month of the search for international audience.

Reply 7: We have added the month of the search.

Changes in the text: See page 8, line 145.

Comment 8: Line 113: I couldn't find the full search strategy referred to.

Reply 8: We have now added the search strategy as a supplemental document (as was intended).

Changes in the text: None

Comment 9: Lines 125-130: Please add references for the sentences where you define palliative care and training.

Reply 9: We added references to these definitions.

Changes in the text: See page 9, lines 172-174.

Comment 10: Line 140: Could the training be provided online or only in-person?

Reply 10: Training could be provided online or in-person, so long as it included at least one interactive component. We have added this to the manuscript for clarity.

Changes in the text: See page 9, lines 173.

Comment 11: Line 155: I would suggest you remove "in duplicate" as this is inferred by independently reviewed by two reviewers.

Reply 11: We have deleted "in duplicate" from this statement.

Changes in the text: See page 11, line 202.

Comment 12: Line 158: By "prevalent" theme do you mean identified theme? Why not use the components described by Jacobsen et al.?

Reply 12: The components described by Jacobsen et al. are elements of palliative care provision, such as symptom management and assistance with decision making. We grouped the measures based on the outcomes that the palliative care training intervention were measuring, such as quality of communication, palliative care knowledge/confidence, and health care costs and/or use. These measures are not necessarily encompassed in the components described by Jacobsen et al. and so we felt it necessary to group measures based on the phenomena being examined.

Changes in the text: We removed "prevalent". See page 11, line 204.

Comment 13: It is not clear if the data extraction included information about each component of PICO – sample size, target group, intervention characteristics etc.?

Reply 13: The data extraction from our previous systematic review includes the components of PICO. In particular, details on the education interventions, sample size, and groups of comparisons for the completed studies are provided in our prior review – this is now indicated in the text in the Results – Description of Studies and Interventions section.

Changes in the text: Page 13, lines 255-256.

Results

Comment 14: Line 193: Ensure reporting is consistent. Time commitment is the 4 hours held in one session/over x days to x hours held over x sessions over 20 months.

Reply 14: We now frame this information in term of education program duration, as opposed to time commitment, to make reporting more consistent. In general, programs of a longer duration did not specify a total time commitment.

Changes in the text: Page 13, lines 251-254.

Comment 15: Summary tables: I found the summary tables tricky to follow and compare studies. I would suggest you have a table that summarises each study (PICO) and just lists type of outcome, and then have a second table that details the outcomes and measures used (similar to Table 3 in article by Fischer, F., Helmer, S., Rogge, A. et al. 2019)

Reply 15: The objective of our review was to explore the measures used by the studies identified. As stated, and now clarified in the paper, we examined the effectiveness of these studies and the PICO elements in a prior review that will be published soon. In our current review, Table 2 shows the number of studies in each outcome category.

Changes in the text: None

Comment 16: Line 234: might be clearer if you give a level 1 example and a level 2 example – I first read it as self-reported competency being a level 1 measure whereas it is a Level 2 measure.

Reply 16: We now provide examples of level 1 and level 2 measures.

Changes in the text: Page 15, lines 310-312.

Comment 17: Line 235: I am not familiar with the term “medical interaction analysis” – would it be simpler to use assessed observations in practice or something commonly used in the training literature. This would also cover non-medical HCPs.

Reply 17: We have changed the term “medical interaction analysis” to “assessed observations in practice/simulation” throughout the manuscript.

Changes in the text: See page 15, line 312; page 19, line 383; page 19, line 396.

Discussion

Comment 18: The discussion lacks a comparison to other studies.

Present the key findings, compare your findings with other studies, discuss limitations of the evidence included in your review and then the limitations of the review process.

Finally, end with implications of your results for practice, policy, and future research.

Reply 18: We recast the opening sentence to the second paragraph in the Discussion to tie in other relevant reviews (3+), mentioned initially in the Introduction. In the discussion we also provided insights and recommendations for practice and further research based on our findings. We were not able to find any reviews on palliative care training outcomes to which we could draw comparisons. As is now more fully explained, outcomes relevant to palliative care program evaluation are different to those for training interventions, and are worthy of two distinct papers.

Changes in the text: Page 17, lines 344-346.

Comment 19: Line 267: I would suggest using “such as assessment of observations with

simulated or real patient encounters”. These are just two ways you can measure behaviour change, other examples could be through clinical audit, medical record review.

Reply 19: We have inserted this statement into the manuscript as recommended.

Changes in the text: See page 17, lines 352-353.

Comment 20: Line 272: This would be strengthened if you compared this previous review’s findings with your review findings – it is not clear how they differed or were similar

Reply 20: We conducted a prior systematic review that looked at the effectiveness of palliative care education programs. This is now described in the Introduction. Otherwise, we were not able to find any similar reviews to which we could make comparisons.

Changes in text: page 6, lines 94-102.

Comment 21: Line 286: See my earlier comment about medical interaction analysis

Reply 21: We have changed the term “medical interaction analysis” to “assessed observations in practice/simulation” throughout the manuscript.

Changes in the text: See page 15, line 312; page 17, line 352; page 19, line 383; page 19, line 396.

Comment 22: Line 331: I don’t understand this sentence – consistent approaches for what exactly?

Reply 22: We have removed the word consistent from this statement for clarity.

Changes in the text: See page 21, line 441.

Comment 23: Line 340: Only 11 validated measures were used in 2 or more studies. Why isn’t the exact number used here?

Reply 23: We state it this way because our cut off for “common measures” was use in a minimum of 2 studies.

Changes in the text: None.

Reviewer C

Comment 1: I found the topic really interesting and commend the authors on such a large systematic review. From my understanding, this systematic review seeks to examine the outcome measures used in studies of palliative care training interventions for HCPs who are not specialised in palliative care. I offer my feedback for consideration to help clarify this for the reader and to raise the authors awareness about issues that I would find fascinating to consider within this work.

Reply 1: Thank you for your comments.

ABSTRACT

Comment 2: I applaud the authors for the synthesis in the background to set the scene for this work.

The research methods were clear.

I do not have clarity as to why there was separation of studies that focused on palliative care communication skills in the presentation of results. I am wondering if this is something the authors could re-consider or address in their presentation of results.

Conclusions were appropriate.

Reply 2: Nearly half (44%) of all studies focused on communication. We felt it suitable to separate the studies focusing on communication skills for comparison of measures used across like studies. We have added a statement to reflect this reasoning.

Changes in the text: See page 12, lines 239-240. [All Mark-Up/Track Change version with line strike-outs shown]

INTRODUCTION

Comment 3: I did not find the same clarity of argument in this section as compared to the abstract. In lines 78-80, the authors make note that measures focused on improving patient care are "fundamentally different" to evaluation of the impact of education interventions, however, this is not explained to the reader. Given that the Kirkpatrick model level IV identifies the impact of change and how this is drawn upon in the discussion, I wonder whether the authors could consider integrating some of this into the introduction to help clarify the rationale for this work. Similarly, the authors should consider addressing why the outcome measures used in reviews of specialist palliative care education initiatives are not applicable to interventions for non-specialists. This was clear to me, and as such, the potential impact of this work was affected.

Reply 3: We edited the introduction to clarify the difference between measures for program evaluation and those to assess the impact of education interventions. We revised "are fundamentally different" to state "are different and downstream".

Changes in the text: Page 7, lines 113-114.

MATERIALS/METHODS

The search strategies appeared rigorous.

Comment 4: (a) Did the search only involved education initiatives provided in English or other languages? (b) I was interested in why the exclusion criteria were selected, particularly interventions associated with paediatric palliative care and those without in-person interaction. Are the authors suggesting that the palliative care skills required for different patient populations based on age are inherently different? I cannot imagine that the number of interventional evaluations focusing on pediatric palliative care educational initiatives are large, and given that the focus of work is largely on generalist physicians, I would like some comment about choice of this exclusion. (c) Similarly with no in-person interaction, I am interested in some comment in the paper as to why this was chosen (especially in the advent of numerous virtual educational packages, in light of COVID-19).

Reply 4: (a) Our search only included studies published in English, though the training could occur in different languages. We have added a statement to the manuscript to reflect this. **(b)** A priori, one of our exclusion criteria was "pediatric focus only" because the palliative care needs of children and infants, and their parents tend to be persistently complex and often require involvement of specialized palliative care teams with unique training. The peds/ adult

palliative care differences in approaches to training are outlined in the following paper: J Clin Oncol 2018 Mar 10;36(8):801-807. doi: 10.1200/JCO.2017.75.6312. That said, when we went back to provide more detail in our CONSORT diagram, we did not end up excluding any articles based on this reason of “pediatric focus only”. That is, none of the “pediatric focus only” articles retrieved met our other inclusion criteria, e.g., a trial, health care professional training, etc. We added a sentence to Results to report this finding. (c) We have clarified in the Materials and Methods that training could be offered in person or online, so long as there was an interactive component.

Changes in the text: (a) See page 8, lines 149-150. (b) See page 12, lines 231. (c) See page 10, lines 187.

RESULTS

1. Study Selection

Comment 5(a): I found the presentation in this section challenging to follow. I wonder whether greater clarity for the reader may be achieved by not moving between "original studies" and "original papers", and "review studies" and "review papers", but listing the "original papers" as that and "review studies" consistently. Then on line 175-6 (if I have interpreted correctly), this could be revised as "Following preliminary screening of all original papers, 55 full-text articles and 27 published protocols were examined; 36 were eligible for inclusion, 28 with published results and 8 with published protocols only". (b) I was unclear whether the five included studies identified from published protocols but not found in the bibliographic database search (described in lines 77-79), were already part of the 36 included studies or in addition these. (c) The PRISMA flow chart was different to one that I am used to, and which I honestly think makes the study selection more transparent (see Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71). (d) As mentioned in the abstract comments, I am unclear why the authors chose to separate "General Palliative Care" and "Communication studies". If it is to improve clarity, then please include that as the reasoning was not apparent to me throughout the entire manuscript.

Reply 5(a): We revised the Study Selection section to ensure we are consistent in saying “original papers” and “review studies.” Thank you for your revision suggestion; we have made this change. (b) There are no duplicate studies represented – the five protocols are not counted twice. We have clarified this in the text. (c) We replaced the PRISMA flow chart with the PRISMA 2020 version. (d) Nearly half (44%) of all studies focused on communication. We felt it suitable to separate the studies focusing on communication skills for comparison of measures used across like studies. We have added a statement to reflect this reasoning.

Changes in the text: (a) See page 12, lines 225. (b) See page 12, lines 234. (c) See Figure 1. (d) See page 12, lines 239-240.

2. Description of Studies and Interventions

Comment 6: (a) In the sentence (lines 192-194), consider adding the word 'training' before interventions to reorient the reader to the intervention type.

(b) I am interested in how many of the studies focused on oncology versus non-oncology care providers. As the authors are aware, there is a focus within the palliative care community on the differences in the distribution of resources. Many palliative care services (and hence, educational providers) have emerged from oncology services, and as a result, the focus in palliative care literature has been traditionally weighted towards patients with malignant conditions. I wonder whether this trend is echoed in educational initiatives, and the availability of standardised measures of outcomes.

Reply 6: (a) We have added the word “training” to this statement. **(b)** As shown in Table 1a/b, six “studies” included oncology care providers (including 3 with nurses), however two of these studies were research protocols with no results. It would appear as these clinicians have not been extensively targeted for palliative care training interventions, with the caveat that our review is limited in only considering trial-based research. We have added a statement to the Results section to address the number of studies focusing on oncology care providers. **Changes in the text: (a)** See page 13, line 253. **(b)** See page 13, lines 248-250.

3. Description of Measures Used

Comment 7: (a) I am wondering if any studies only measured patient or family reported outcomes. I think it would be helpful to describe this in text. As the sentence (lines 198-199) currently reads, it implies that it is either/or and the numbers don't equal 100%. I wonder whether the three sentences starting "Half of all trials" (lines 201-207) should come next, and then detail data specific to communication-focused studies. This suggestion is based on discussing the dataset as a whole, and then specific results. (b) I also wonder whether the inclusion of data related to "common measures" (lines 225-229) would fit better under this subsection rather than the next subsection.

Reply 7: (a) None of the included studies only measured patient or family reported outcomes. We have clarified this in the text. Thank you for your suggestion to revise this section; we have made changes in the text accordingly. **(b)** We have moved the section of data related to “common measures” and renamed the subsection “Description of Measures Used and Common Measures”.

Changes in the text: (a) See page 13, lines 262-263 and page 13, lines 263-69. **(b)** See page 14, lines 279-284.

4. Study Outcome Categories and Common Measures

Comment 8: I did not understand the data presented (lines 227-228): "Based on administrative data, 12 studies examined health care costs (3 studies)" - is it 12 studies or 3 studies?

Reply 8: The sentence has been edited for clarity.

Changes in the text: See page 14, lines 282-284.

DISCUSSION

Comment 9: After summarising the results of the study, the authors highlight in the second paragraph (lines 264-270) that a combination of measures (addressing the levels of the Kirkpatrick model) are useful. They then focus on drawing on literature related to objective behaviour change and the challenges associated with this, and then

progressed discussion from here. I think the clarity of this progression could be clearer with some relevantly simple revisions (largely reorganisation of current discussion). For example, the sentence (lines 266-270) could be revised to "While participant satisfaction with the program and the perception of skill acquisition are formative to knowledge uptake and application in practice, objective measures of behaviour change - indicated either through simulation or real patient encounters - are necessary to empirically demonstrate the effectiveness of an education intervention". Then include a sentence about how patient/family reported outcomes are an empirical measure of HCP behaviour change (such as lines 298-302), followed by the results of the study, integration of the prior systematic review of specialist palliative care providers, and challenge of this in relation to time of measurement. I would then include an overt linking comment that health care system outcomes could also be considered a measure of behaviour change prior to lines 280-285.

The next paragraph could then start with "medical interaction analysis used by many of the studies included in this review shows promise for..." The role of this paragraph is to provide an avenue to address the challenge in objectively measuring behaviour change, with the caveat that this was included more in communication-focused competencies. I am uncertain what the authors were trying to convey with lines 290-292 "Assessing the multidimensional effect of a comprehensive palliative care education program through patient simulation is more methodologically challenging than using more pointed intervention focused on communication skills" - could the authors please consider on why they have made this statement? Given the emergence of simulation-based educational programs drawing on relevant educational theory, I am interested in how the authors came to this and am interested in their justification for this statement in relation to where they are trying to progress the reader to.

The following paragraph could then focus on using medical interaction analysis in combination with standardised patient reported outcome measures show promise (lines 313-316) and then draw on the results that illustrate the use of few standardised measures in the data to progress the idea that there is a need to move towards consistency and standardisation of measurements for all reasons listed in the text currently.

By doing this, I think the authors will progress discussion in a more logical and impactful manner using the results of this review to inform the discussion.

Reply 9: a) We have made all these suggested changes to the Discussion and revised the areas for clarity. Thank you for your suggestions. b) We revised the section mentioned above about the use of Assessed Observations in Simulation/Practice in comprehensive palliative care education programs vs. communication skills programs.

Changes in the text: a) See pages 17-21, lines 344-427; b) page 18, lines 383-396.

CONCLUSION

Comment 10: If the authors decide to reorganise the discussion as above, then I think the conclusion can be more succinct to improve clarity. I really like the messaging of the conclusion in the abstract and would encourage the authors to not try and reiterate results but pull their key messages into this section.

Reply 10: We have edited our conclusion to make it more succinct.

Changes in the text: Page 22, lines 450-454.

Reviewer D

Comment 1: This is a systematic review of palliative care educational interventions describing outcome measurements of the educational intervention for non board certified primary palliative care providers. Given the high need and limited workforce, the topic is highly valid and very useful

Reply 1: Thank you for your comments.

Reviewer E

Comment 1: This is an interesting and rigorous systematic review of the outcome measures used to assess primary palliative care educational interventions. The conclusions – that our intervention-assessments should include validated outcomes of patient-experiences, that reproducible and valid instruments are necessary to “pool” data and advance clinical care/research, and that we need longer-term follow-up to determine the impacts of our interventions – are all important messages for palliative care clinicians and educators, as well as those other health-care clinicians who care for patients with serious illness and provide “primary” palliative care.

Reply 1: Thank you for your comments.

My main concerns are two-fold:

Comment 2: (1) Some of these conclusions seem a bit unfounded. For example, although this review demonstrates that most intervention studies have short (3-month) follow-up periods, there is no evidence presented herein that longer follow-up would change individual study conclusions. In fact, the limited educational intervention research that is available suggests the opposite; that clinician skills are not necessarily maintained and that corresponding patient-reported outcomes tend to reflect broader medical experiences rather than a single clinician’s communication style, etc.

The pattern within this manuscript is similar. I wonder if it would be stronger if the authors were able to better synthesize what they have already published regarding intervention efficacy with opportunities to improve that efficacy with robust methodologies. In other words, if the goal is making sure these programs work, it is hard to conclude “do more” without also showing readers what works and what does not.

Reply 2: In a prior related systematic review (currently in press), we aimed to determine the effectiveness of existing training programs—which is in essence, what programs worked and in what ways. In this review however, we were really focused on what outcome measures were used to determine what works (and less on whether the programs work). We have added some context regarding our previous systematic review to the Introduction. We also restructured the Introduction and Discussion for clarity to emphasize that this review is focused on the outcome measure, not on any program effectiveness.

Changes in the text: See page 6, lines 92-102. And page 18, lines 368-373 as an example of

changes we made in the Discussion. [All Mark-Up/Track Change version with line strike-outs shown]

Comment 3: (2) (a) Some of the methods warrant justification, if not revision. For example, there is no justification for not including pediatric populations in this review. If the goals of educational interventions are to teach clinicians to communicate and/or care for patients with serious illness, the SKILLS used by pediatric clinicians are in fact the same as those used by clinicians caring for adults. This review should include studies of ALL healthcare clinicians, not only subsets.

(b) Similarly, the inclusion of diverse national groups with inherently different training requirements and competencies begs the opposite question: how can we pool educational program outcomes when the baselines are so very different? Likewise, demanding certain “valid” instruments is nearly impossible across national lines when things like language and clinical norms will undermine such universal tools.

The authors do not justify these approaches nor do they mention their limitations. The article would be considerably stronger if this was addressed.

Reply 3: (a) In our study, “pediatric focus only” was one of our exclusion criteria, as we felt that pediatric palliative care might require specialized skills, hence the case for child life specialists or specialized pediatric palliative care teams (See Widger K et al, J Clin Onc, March 2018). Though we take your point that the skills used are very similar. However, this might be moot. Because when we went back to provide more detail in our CONSORT of what was excluded and why, we did not exclude any of the pediatric studies for this criteria only. None of the pediatric studies retrieved met our other inclusion criteria, e.g., a trial, health care professional training, etc. We added a sentence to Results to report this finding.

(b) In the Results, we state that the studies were conducted in Europe (n=14), North America (n=11), Asia (n=7), and Australia (n=4). Although standardized measurement across difference languages and cultures presents a challenge to all research, there are many validated questionnaires to measure palliative care outcomes that have been translated into multiple languages. Many of these validated surveys were used, regardless of the country setting, the problem we found little consensus between included on the best ones to use. We have added a statement regarding “language and practice norms” as a limitation in the Discussion.

Changes in the text: (a) See page 12, lines 230-232. **(b)** See page 21, lines 433-435.

Several additional minor considerations include:

Comment 4: - Line 106: please define “ASRCTN”

Reply 4: We have added the definition of ISRCTN to this statement.

Changes in the text: See page 8, line 146-147.

Comment 5: - Even this palliative care clinician was confused about the domains of Palliative Care. For example, what is the definition of “identification and assessment” (seems like something all clinicians do, what makes it unique to palliative care?). Is

“coping” an assessment of patient/family coping, or is it the process of providing coping support?

Reply 5: Identification and assessment refers to the early recognition of an individual who may benefit from a palliative approach to care and assessing their needs. Coping refers to an assessment of patient/family coping. We have added some text to clarify these definitions.

Changes in the text: See page 10, lines 179-183.

Comment 6: - The authors refer to healthcare workers as “providers.” I would remind them that family caregivers are also providers, often providing more healthcare than trained clinicians. Please consider calling healthcare workers something that is more distinct (i.e., “clinician”).

Reply 6: We have changed the term “providers” to “clinicians” throughout the manuscript.

Changes in the text: See manuscript.

Reviewer F

I commend the authors for taking on this interesting review. It is clear that they put a significant amount of time, thought, and consideration into their work. The study seems to add to the literature. The tables are very helpful in understanding the variability among studies, and the results are clearly explained. Despite these strengths, the manuscript would benefit from further editing to address multiple areas of excessive wordiness, unclear language, and soggy syntax, all of which make it challenging for the reader to follow the author's thought process. Please see just some of the examples below, which represent some of the common clarity issues in the manuscript but are not all-inclusive.

Reply: Thank you for your comments.

Comment 1: 1. Suggest defining and using the term "primary palliative care" in place of "non-specialized palliative care clinicians having some competency..." (Line 61), and in place of the phrase "other than specialized palliative care clinicians" (Line 124)

Reply 1: We have now explained it as “generalist clinicians providing primary palliative care” to differentiate it from specialized palliative care provided by palliative care specialists. (as per Abernathy and Quill, NEJM 2013).

Changes in the text: See page 6, line 88-89 and page 9, line 166-168. [All Mark-Up/Track Change version with line strike-outs shown]

Comment 2: 2. Would clarify, what is "evidence-based spread"?

Reply 2: We have deleted this phrase for clarity.

Changes in the text: See page 6, line 125.

Comment 3: 3. (a) Confusing syntax throughout. i.e lines 225 and 256: "11 different validated questionnaire measures were used in 2 or more trials". Suggest "..were used in at least 2 trials.". (b) Line 280: confusing phrasing- "is relatable"?. (c) Line 289: confusing syntax "HCP interaction analyses with patients"

Reply 3: (a) We have changed this statement throughout to say “were used in at least 2

trials.” (b) We have eliminated this phrase and edited the sentence for clarity. (c) We have reworded this phrase and edited this sentence for clarity.

Changes in the text: (a) See page 4, line 70; page 14, lines 279-284; page 16, line 335; page 22, line 450. (b) See page 18, line 370-375. (c) See page 19, lines 387.

Comment 4: 4. Recommend not presenting detailed results in the discussion section, i.e. lines 302-303. Would make sure the specific results are placed only in the results section, with the discussion section serving as a focused analysis and interpretation of the results.

Reply 4: We removed the number from the text and added these details to the Results section.

Changes in the text: See page 20, lines 406-407; page 13, lines 267-269.

Comment 5: 5. There are many long sentences that make the paper very wordy and confusing. Suggest reviewing the manuscript for any lengthy sentences and re-writing them in shorter, concise sentences to make it easier for the reader. For example, in lines 312 to 313, the authors could rewrite this same idea more clearly as "Most important is the use of validated measures that reflect the content of the intervention". There are many sentences with too many clauses in them that are unnecessary and make it harder to read, i.e. lines 328-331.

Reply 5: We used this statement in the manuscript. We also revised the second statement and made changes throughout the remainder of the text to be more concise where possible.

Changes in the text: See page 20, lines 417-418 and page 21, lines 435-437.

Comment 6: These issues of excessive wordiness, poor sentence clarity, and soggy syntax weaken the paper's strong methodology and other strengths. Once these issues are addressed, the manuscript will be much stronger.

Reply 6: We have made edits throughout our manuscript to be more concise where possible.

Changes in the text: See manuscript.

Round 2

Review Comments:

The authors made several edits that strengthened the manuscript. My concern continues to be the clarity of writing, which I believe makes it difficult to follow many of the important ideas throughout the paper. I would suggest the authors read the paper very carefully, sentence, looking at whether the sentence can be re-written to be more clear. There are many very wordy sentences that slow the reader down as they try to figure out the main point of the sentence. Below are some examples.

57-60 sloppy syntax, wordy, and hard to follow. Recommend instead "we conducted a systematic review of palliative care training intervention trials and evaluated the outcomes measures used."

72- instead of "nearly 200" would write the exact number.

86- would remove "specific to communication studies" and instead use "only X% (include exact percentage) of communication studies analyzed clinician interactions..."

139-143-confusing. Suggest re-write to clarify

143-145 confusing. Suggest "To our knowledge, no current reviews specifically examine outcome measures used in palliative care education interventions delivered to interprofessional clinicians"

217-218- this sentence is written poorly and confusing. Do the authors mean that the patient populations ranged between those earlier in their trajectory to those at end of life?

242- Suggest "Included studies underwent assessment of title, abstract, and then..."

469-501 hard to follow the idea

510-512- confusing sentence, hard to follow

overuse of the phrase "focused on"

Examples:

line 106- recommend "A systematic review by Brighton et al 2017 which evaluated end-of-life care communication skills training found 153 unique training interventions."

line 385- recommend "most of the communication skills related trials (12 of 16) measured quality of communication through an external rater. The remaining four studies measured clinician-reported use..."

line 432- recommend "Nearly half of the studies involved communication skills programs"

line 507- recommend "The communication skills training trials mostly analyzed clinician behaviors in their interactions with patients".

510-511- "there was only one trial identified outside of those focused on communication skills". Confusing, suggest re-write for clarity. Maybe "Only one trial not focused on communication skills used observation of practice." Also would put the trial as an in-line reference so the reader can look at it.

Reply: Thank you to the Annals of Palliative Medicine editors and reviewers for their further review and feedback of our manuscript, and the opportunity to submit additional revisions. The reviewer provided several examples throughout the manuscript that required clarification and suggested rephrasing for some of these sentences. We have incorporated these suggestions and rewritten all the text the reviewer noted. The authors re-read the manuscript and edited it throughout to improve clarity overall. There were also a few spacing errors in Table 1 that we corrected.