Author’s response to reviews

Title: Screening with the double surprise question to predict deterioration and death: an explorative study

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Author’s response to reviews:

To the editor in chief of BMC Palliative Care
Dr. S. Robin Cohen

Nijmegen, September 24 2019

Dear dr Cohen,
Thank you and the reviewers for your useful comments and suggestions. With all these comments we were able to improve the manuscript. Below you find our reactions and adaptations. We uploaded the revised manuscript with track changes, and a clean one.

Best wishes, also on behalf of the other authors,
Carel Veldhoven

Editor Comments:

Two reviewers have carefully considered your manuscript and made some important suggestions that I believe will improve the manuscript. I also have a few questions and comments of my own.

1. Were either of the two doctors who participated in the study also authors on the paper? If so, state this in the manuscript. They may be more motivated than most will be, and therefore different results obtained.
The doctors who participated in this study (CV and WG) are also author on this paper. Besides they are trained in respectively palliative care and frail elderly care and are familiar with both SQs. This might have influenced the results (page 4, see lines 136-137):
We performed an explorative, prospective study with a retrospective medical record review. In May 2016, two GPs (CV and WG) answered the DSQ for each included patient of their dual practice.

2. Lines 60-63. Referring to SQ1, the authors state “Unfortunately, its specificity is limited; a large number of patients identified by the answer ‘no’ on SQ1 cannot be considered as palliative patients, as many are still in an acceptable health condition. Moreover, providing structured palliative care to all patients that are identified by SQ1 would ask disproportionate time investments and resources.” Lines 209-211 read: “In general practice, it is not feasible to provide proactive palliative care to all patients identified with SQ, because of time constraints. Moreover, providing proactive palliative care to patients not in need of it is undesirable for patients and GPs.” These statements are at odds with most widely accepted definitions of palliative care: that it is appropriate from diagnosis on (e.g. WHO definition of palliative care). Palliative care involves addressing the needs of the patients in order to improve their quality of life. It is unclear to me what you mean by “structured palliative care.” Do you mean specialized palliative care? Specialized palliative care is not needed every time that a physician answers ‘yes’ to the SQ. GPs should be providing basic palliative care, which is care that meets the patients’ needs and plans for future needs when there is further deterioration (for example, advanced care planning; seeing the patient more often; assessing the potential caregiving situation). How do you understand proactive palliative care being undesirable for both patients and GPs? Since palliative care is about meeting current needs, and thinking about what might happen if the future doesn’t go well in order to ‘plan for the worst but hope for the best’, how is that undesirable for most patients? One need not say “You are a palliative care patient” in order to address the palliative patient’s needs. Proactive palliative care may prevent crises, which would be better for the patient and family, and perhaps the GP as well, since prevention may take less time than managing a crisis. If you are going to make an argument that contradicts the accepted definition of palliative care and literature showing the benefits of early intervention, then it needs to be better argued and referenced.

I agree that palliative care is appropriate from diagnosis on and involves addressing the needs of the patients and their relatives in order to improve their quality of life. In this study however the novelty is that we screened a whole community population of 75+. Consequently the group of persons with the answer ‘no’ on SQ1 is large. Therefore providing palliative care to all these patients, would ask disproportionate time investments and resources. We believe the DSQ can help to differentiate in what group palliative care is most needed and should be started immediately (group 3), and a group that needs monitoring and less intensive palliative care. We changed the wording on page 3, lines 72-74: Moreover, although desirable, providing structured or specialized palliative care to all patients that are identified by SQ1 when used as a screening tool for a wider population would ask disproportionate time investments and resources.

3. Background lines 71-74. “In this pilot study we therefore compared the accuracy (sensitivity, specificity and predictive values) of the DSQ in daily clinical practice regarding 1-year mortality to SQ1 alone, and compared health care needs and actually provided palliative care in relation to the answers on the DSQ.” Here it is stated that this is a pilot study. In the Discussion it is stated that this is a feasibility pilot study. However, the stated goal of comparing accuracy is not a pilot study question, as it does not address feasibility of the use of the DSQ or of the study procedures. In what ways is this a feasibility pilot study (or any sort of pilot study) rather than a small study? Please clarify this throughout the manuscript.

Considering your comment and that of Nicola White we think this is rather a small explorative study than a pilot study. We changed this in the title and the entire manuscript.
I look forward to seeing a revised manuscript.

Nicola White (Reviewer 1): Overall

I would like to applaud the authors on such a well written and interesting piece of research. Whilst there has been an increase in research using the SQ, which has always been shown to be 'prognostically' challenging, the introduction of the second question could indeed improve the sensitivity of the question.

The manuscript details a prospective study followed by a blinded retrospective medical notes review. I have not seen this approach before and applaud the novelty of it. The authors review the case notes for survival at one year and extract data on palliative care use during the last year. The results are well reported and the conclusions are fair. Thank you for putting this research together.

I think this manuscript should be accepted pending some of the suggestions below:

Abstract
The abstract is very clear and precise. The final sentence states that it is a pilot study, I think this should be incorporated in to the design section.
Considering all comments we think this is rather an explorative study than a pilot study. We changed this in the entire manuscript and title.

Introduction
The introduction contains all of the references I would expect when discussing the Surprise Question in primary care.

Lines 57-62 discuss the prognostic capabilities of the SQ. I think I would disagree that it is mainly used with cancer as many of the studies identified in the references cited were End Stage Renal Failure or Heart Failure. I would also disagree with the statement that the SQ is a sensitive predictor at 1- year mortality - again one of the references cited says "ranged between 11.6% and 95.6% for specificity".

The prognostic accuracy of the SQ has been reported as extremely variable from previous research. It might be clearer to report this wide variation and that the DSQ could help to improve this variation.
Thank you for this valuable comment. I agree that the prognostic accuracy of the SQ1 is extremely variable. The DSQ could help to improve this variation. We changed this in the manuscript on page 3, lines 68-72, and also added two references (studies of Lynn):

Its accuracy to predict 1-year mortality has been studied in several populations, (13, 14) but the original purpose of the SQ1 is not prognostication but identifying palliative care needs.(12, 15) Unfortunately, its specificity and prognostic accuracy vary largely; a large number of patients identified by the answer ‘no’ on SQ1 are not in need of palliative care, as many are still in an acceptable health condition.

It would be helpful in this introduction to note that the purpose of the SQ was not to predict survival but to identify need. (Lynn, J. (2005). Living long in fragile health: the new demographics shape end of life care. Hastings Center Report, 35(7), s14-s18.)

See our answer above

Minor comments
Lines 45-6: there are two statements here made about the age - it would help to have a reference for these statements.
We added two references on page 3, lines 52-55:
The majority of people in need of palliative care are of older age. This group will further increase because of an aging population. Moreover, as Bennett and all showed, older age is associated with a shorter duration of palliative care.

Line 51: systematic change to systematically
We adapted this.

Methods
Could you clarify if the two doctors produced one response between them to the SQ & DSQ or if they answered independently?
We made this clear in the revised methods section on page 4, lines 140-144:
Patients were not involved in the design of the study. Participants were two GPs in a dual practice in the Southeastern part of the Netherlands. In this practice, both GPs often have a longstanding relationship with their patients. One male GP (CV; 57 years of age, 21 years of experience) had had specialized training in palliative care, the other female GP (WG; 42 years of age, 13 years of experience as a GP) had had specialized training in elderly care.

There is some confusion and repetition in the presentation of the information - it might be helpful to follow a reporting guideline for structure. For example, the data collection section is slightly redundant as it repeats information previous said or reports information that should be in different sections (e.g. discussing bias [lines 127-131] could go in the analyses section, lines 123-6 could go in the outcome measures section [I would also remove the reference to the tables in this section - perhaps table 1 should be supplementary?]). Additional suggestions of this nature are made in the minor comments below.

We restructured the methods section on page 4 and 5.

For the secondary outcome measures, it would be helpful to have a definition of palliative care and why these four outcomes were selected as a measure of this.
We added a definition and changed the wording on page 5, lines 191-194:
Next, we related the answers to the SQs to the quantity of received palliative care (secondary outcome measures 1 and 2). Besides, based on the WHO definition of palliative care that states that it should be multidimensional and proactive,(18) secondary outcome measures 3 and 4 were chosen to measure the quality of palliative care:

Minor comments
In the design section, I would usually just expect the description of the study design (i.e. prospective cohort study with retrospective medical record review). Included in this section are parts of the procedures. I would add another section of "setting" (which follows standard STROBE reporting guidelines) to include details of the location, dates, procedures etc.
In the participants section, I would relocate the ethical detail (lines 94-9) to either the setting or its own heading "ethics". In this section, would it be possible to add some demographics about the GPs? They were also participants and it would be helpful to know information such as years of practice etc.
In the outcome measures section, you have described the analysis of the SQ & DSQ responses. I would move this to the analysis section. In this section, your primary outcome is death at 1-year. How did you
find this out - I assume by the GP medical records - but it makes it easier to read if it is fully transparent. Equally for the secondary outcomes, perhaps reiterate that it was through a medical records review that the information was extracted.

In the data collection section, can you explain why you need to control if advanced care planning had already been performed?

We adapted the methods section accordingly on pages 4 and 5.

Results
The flowchart really aids the description, thank you.

The statistics for the primary outcome, with the addition of the table, are appropriate. What I find difficult to digest is the paragraph explaining them. It doesn't seem to follow a process but jumps around between groups.

We made the paragraph more logical, by first presenting all figure of Q1 and next of Q2 (page 7, lines 290-298):

In total 26 patients died during the year of study, of whom two, who both died unexpectedly, had not been identified with SQ1 (SQ1 = no) (sensitivity SQ1: 92%). The specificity of SQ1 was 49%. Of the 161 patients identified with SQ1, 24 died (PPV SQ1: 15%). The negative predictive value (NPV) of SQ1 was 99% (Table 3).

Ten of the deceased patients had been identified with SQ2 (SQ2 = yes), 14 had not (sensitivity SQ2: 42%). The specificity of SQ2 was 91%. With SQ2, 22 patients had been identified, of whom ten had died (PPV SQ2: 45%). The NPV of SQ2 was 90% (Table 3).

After a year, 46% of the patients in group 3 had died, compared to 10% of the patients in group 2 and 2% of the patients in group 1.

Perhaps it might help to stage the information with subheadings relevant to the SQ? I leave this to the discretion of the authors but my suggestion would be:

1. Death prevalence overall "Out of the 292 patients screened, 26 died (9% mortality); two of these were not identified from the SQ"
2. Subheadings for SQ1 & SQ2 / group number - what was the overall accuracy i.e. total number of correct estimates? This would help to give an overall idea to the reader rather than going in with the diagnostic testing immediately. From what I can tell - SQ1 - 153 (129+24) correct / 292 total (52% accuracy). SQ2 - 135 (10+125) correct / 161 total (84% accuracy).

Rather than just reporting the statistics as has been done on lines 171-172, it might be easier to just refer to the table or expand on the explanation as has been done on lines 167-170. Instead of adding these figures to the text, we added them to table 3, and we made the text more logical on page 7, lines 290-296:

In total 26 patients died during the year of study, of whom two, who both died unexpectedly, had not been identified with SQ1 (SQ1 = no) (sensitivity SQ1: 92%). The specificity of SQ1 was 49%. Of the 161 patients identified with SQ1, 24 died (PPV SQ1: 15%). The negative predictive value (NPV) of SQ1 was 99% (Table 3).

Ten of the deceased patients had been identified with SQ2 (SQ2 = yes), 14 had not (sensitivity SQ2: 42%). The specificity of SQ2 was 91%. With SQ2, 22 patients had been identified, of whom ten had died (PPV SQ2: 45%). The NPV of SQ2 was 90% (Table 3).

Discussion
This is the first mention that this is a pilot study. Why was it a pilot? This should be added in to the design section.
As mentioned above, considering all comments we think this is rather an explorative study than a pilot study. We changed this throughout the manuscript and title.

I think a limitation of GP bias should be addressed. Whilst the researcher was blind extracting the information, the GPs could potentially recall the small number of patients in group 3. This might have impacted how they treated the patient. A small bias, but one that should be noted none the less. Indeed, there is a small chance that the GPs could recall the patients in group 3 and this may have influenced the results. We added this to the discussion section, page 8 lines 355-358:

While planning care for their patients, the GPs were therefore not actively influenced by the answers to the SQs, although there is a chance that the GPs could recall the small number of patients in group 3 which might have influenced the results. However, if this was the case, to our opinion this recalling of the patients in group 3 will be more related to the frail condition of these patients than to the answers to the SQs.

Jun Hamano (Reviewer 2): This prospective cohort study with retrospective medical record review aimed to clarify the accuracy of this double surprise question (DSQ) in a general practice. This research question is important for developing the primary palliative care.

The result seems to have good implication, though there might be the limitation in terms of methodology.

1. Although, authors compared Group 1, Group2a and Group 2b, it is needed to include the group which is SQ1 yes + SQ2 yes, and SQ1 yes + SQ2 no, if author want to clarify the usability of DSQ. Therefore, it is difficult to conclude the DSQ discriminates between patients with different life expectancies and care consumptions, and also show that SQ2 complements SQ1. The reason why I think this way is that author described as "we added a second question (SQ2) 23 to SQ1: 'Would I be surprised if this patient is still alive after 12 months?'".

Indeed, our SQ2 is only asked for those patients of whom SQ1 is answered with ‘no’. The reason is, that If the answer on SQ1 is yes, the answer on SQ2 is always no. Therefore the group SQ1 yes + SQ2 yes does not exist. For this reason, posing SQ2 if the answer on SQ1 is ‘yes’ is useless. That is the reason why we did not report this.

However, it is possible to calculate the accuracy of SQ2, in which the theoretical combination SQ1 yes, SQ2 no is added to the group SQ1 no SQ2 no. In these calculations, of this ‘total SQ2’ the figures are:

Sensitivity = 38.5%
Specificity = 95.5%
PPV = 45.5%
NPV = 94.1%

As these figures are less practice-based than the figures in the manuscript, we suggest not to use them in the manuscript, as they might be confusing for the readers. However, if you prefer adding this to an appendix, we are happy to do so.

2. In line 196 to 197, author described "by asking both questions, a division into three groups was made with largely different death rates". But, as I mentioned above they did not assess the both question for all participant. It might be better to clarify the definition of DSQ, or change the definition of DSQ in their article. (eg. DSQ is adding SQ2 to SQ1 positive patient)

This is a useful comment and is changed in the manuscript on page 3, lines 77-79:

We hypothesized that adding SQ2 if SQ1 is answered with ‘no’ helps to select those patients with a
high chance of deterioration or dying within one year, and thus are in urgent need of early palliative care.