Author’s response to reviews

**Title:** Effectiveness of Computerised Clinical Decision Support Systems for Asthma and Chronic Obstructive Pulmonary Disease: A Systematic Review

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**Author’s response to reviews:** see over
Letter of response to reviewers

Dear Editor

Thank you for organising the review of the manuscript # 2645482591322673, entitled “Effectiveness of Computerised Clinical Decision Support Systems for Asthma and Chronic Obstructive Pulmonary Disease: A Systematic Review”. We also appreciate the constructive critique provided by the reviewers. Below please find our point by point response to these comments. We hope these comments address the main issues raised by the reviewers, and this improved version is suitable for publication in your journal.

We look forward to hearing from you further.

Best regards

Mariam Fathima

On behalf of the Author Team.

Reviewer: Nicola Murgia

Reviewers Comment:

Major Compulsory Revisions
Even if it could be guessed, the authors should describe in the discussion section the reason why they have excluded studies regarding in-patient hospital based systems. Thus, including papers mainly based on primary and community health care, this fact should be reported also in "strength and limitations" section.

Response:
To make it clear that the review intended to focus on primary care, we have included in the first paragraph of the discussion section a sentence i.e. “The review focussed on studies conducted in primary care as the bulk of the management of these chronic diseases happens in primary care.” Line # 390

Also as suggested, we have included in the strengths and limitation section another sentence with respect to the primary care focus, i.e. “We particularly excluded studies regarding in-patient hospital based CCDSSs as we intended to focus its effectiveness in primary and community health care, given that only a small proportion of people with, asthma for example, are managed in the hospital setting”. Line # 462

We have also changed the title to reflect the fact that the review focuses only on studies conducted in primary care. The title now reads as below, with the words “in primary care” now added.

The review focussed on studies conducted in primary care as the bulk of the management of these chronic diseases happens in primary care.
“Effectiveness of Computerised Clinical Decision Support Systems for Asthma and Chronic Obstructive Pulmonary Disease in primary care: A Systematic Review”

Minor Essential Revisions
In the supplemental file n. 1, in the table, reference 4 (Van der Meer), column "key findings" the word "significantly increased" should be spaced as "significantly increased". In the same file, same table, reference 8 (Rasmussen), column "key findings", "corticosteroids" instead of "corticosteoids". Please verify also in the same table, reference 16, some typos in columns key findings and outcomes.

Response:
We regret having overlooked these minor typographical errors, which probably occurred during the Word to Adobe conversion. All of these have been duly corrected. Further, we have modified Table 1. The columns entitled ‘Focus of the study’ and ‘the intervention’ have been merged and the columns headed ‘Outcomes’ and Key Findings’ have also been merged. We hope these changes make the tabulated studies, neat and specific.

Discretionary revisions
1. The manuscripts is very well written, but, maybe, the introduction section is very detailed, it can be shortened.

Response:
We have now shortened the introduction section. In the previous version, this section occupied 855 words, now it reads at 708 words. The shortening involved taking out some description of the respiratory conditions.

2. It could be very interested for the readers to have a direct comparisons with similar reviews made in diabetes and cardiovascular diseases fields; this would help readers to have a picture of the entity of the results of this review. There are many examples in the literature some of them already reported by the authors (Jeffery R 2013), others can be used for this scope (Anchala R 2012).

Response:
As per your suggestion, we have now added a sentence to highlight the overall impression for data and the similarity with the suggested review in the discussion section. The added sentence reads “This is comparable to other recent CCDSS reviews which also report on the paucity of well-designed studies evaluating the effects of CCDSS on patient related outcomes”. Line # 427

3. Some words on "publication bias" in this specific filed should be spent in the strength and limitation section

Response:
We have included the following in the strengths and limitation section as per your suggestion.
“Our analyses were limited to published reports of randomised controlled trials, so the possibility of publication bias or selective reporting must be acknowledged.” Line # 473
Reviewer: Zafar Zafari

Major Compulsory Revisions

1-There is a lack of comprehensive explanation for the model outcomes. For instance, health care process as well as clinical outcomes has a broad definition. Authors should be more specific in defining the model outcomes and measurement tools.

Response:
We have now defined all the outcomes in the “Methods section” as follows. These definitions are in line with some of the other CCDSS reviews such as Effect of Clinical decision support systems by Bright et al.

Line # 193 “Using classifications published in previous reviews pertaining to CCDSS (Bright et al, reference), we assessed CCDSS effectiveness based on the following key outcomes:

(1) **Clinical outcomes**: Clinical outcomes: Morbidity, health related quality of life, hospitalisations and mortality. [e.g. asthma symptoms (measured using symptom diary), asthma control (Asthma control Questionnaire-ACQ), lung function (Piko-1 device, peak flow meter), health-related quality of life (measured using HRQOL) and adverse events (leading to unscheduled doctors visit or hospitalisation)];

(2) **Healthcare process measures**: Recommended preventive care ordered or completed (e.g. influenza vaccination), recommended clinical study ordered or completed (including spirometry), recommended treatment ordered or completed (including rescue medication prescriptions and antibiotic prescriptions)];

(3) **User workload and efficiency outcomes**: Effect on user knowledge, number of patients seen per unit time, clinician workload, and efficiency;

(4) **Relationship-centred outcomes**: Patient satisfaction surveys;

(5) **Economic outcomes**: Cost and cost effectiveness of the CCDSS used; and

(6) **Use and Implementation outcomes**: Health care provider acceptance, health care provider satisfaction, and health care provider use and implementation.”

2-Authors have mentioned that due to the uncertainty around study outcomes, they were not able to perform a meta-analysis. However, performing a meta-analysis on subset of studies with similar outcome measures is more useful. Authors might do a comprehensive subgroup analysis.

Response:
This is a good point. We did re-examine all the studies we reviewed. For the 19 studies reviewed, there were 23 different outcomes specified and reported by the authors. Only 1-2 studies had somewhat similar outcomes e.g. asthma control/asthma quality of life. We believe it would be meaningless to conduct sub-group analysis comprising 1-2 studies for each outcome of interest. However we calculated the effect sizes for several studies, where sufficient data was provided in the published report in order to allow us to do so. (Reported in Table 1 under the “key findings and effect size” column). Looking at effect sizes will help
readers establish an understanding of study impact. The results section was then re-written based on these calculations and now the results clearly demonstrate that the use of CCDSS has a positive effect on the clinical outcomes, although very few studies (5/19) actually assessed its effectiveness on these outcomes.

2-In terms of the methodological implications, authors need to be more exact on reporting the effect of CCDSS on different model outcomes. Saying only “xxx% of studies have shown significant impact of CCDSS on clinical outcomes” does not carry a valuable and informative message to the policy makers, as the type of clinical outcome as well as its measurement tool is unclear and remains open to questions. A more detailed analysis on this is necessary.
Response:
This has been changed as per your suggestions in the results sections with an explanation on the type of outcomes and the tools used to measure these outcomes. A description of the studies showing a significant positive effect in the primary outcome measured and the tool used to measure these outcomes has been added in the results section. Line # 332

3-Line 295: Out of 10 studies, 6 reported significant improvement, while two did not. What about the reaming two studies??
Response:
We apologise. This part of the results section has been deleted.

Minor Essential Revision
1-line 289, trials is misspelled.
Response:
This minor typographical error has now been corrected.

Thanking You,
Yours Sincerely

Mariam Fathima.