Author’s response to reviews

Title: Women’s knowledge towards neonatal danger signs and its associated factors in Ethiopia: a systematic review and meta-analysis

Authors:

Asmamaw Bizuneh (asmamawdemis@gmail.com)
Getnet Gedefaw (gedefawget@gmail.com)
Adam Wondimeneh (wondmienehadam@gmail.com)
Addisu Getie (addisugetie@gmail.com)
Birhan Alemnew (birhanalemnew12@gmail.com)

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Women’s knowledge of neonatal danger signs and its associated factors in Ethiopia: A systematic review and Meta-analysis.

Dear Editorial Team,

BMC Pediatrics

We thank ‘BMC Pediatrics’ for giving us the opportunity to resubmit this manuscript and we thank the reviewers for their constructive comments and feedbacks. We confirm that we have read the instructions for the authors and respond below to the comments on point-by-point basis. Changes are shown in track changes in the text. We hope you will find our responses satisfactory, and hope that you will find this manuscript acceptable for publication in your journal.

On behalf of all the authors

Asmamaw Demis Bizuneh

Woldia University, College of Health Sciences, Department of Nursing
asmamawdemis@gmail.com
Response for Associate Editor (Dany Weisz):

1) Was there heterogeneity in the studies in regard to how 'knowledge of neonatal danger signs' was defined? This is, it seems, a critical part of determining whether the studies were evaluating the same thing and if the data from individual studies can be pooled? This evaluation and discussion should be included in the manuscript. For each included studies, I would suggest they be described as to how they defined neonatal danger signs, and maternal/paternal knowledge of neonatal danger signs. I am unclear if there is a universal definition, one specific to Ethiopia, or if each study used a different definition.
Response: We appreciated this feedback. We clearly put how each study define knowledge towards neonatal danger signs and we analyze it as a whole as well as by using sub group analysis based on the definition of outcome variables.

2) The use of point prevalence as the measure of 'Knowledge of Neonatal Danger Signs' suggests that the authors consider this knowledge to be binary (Yes/No) outcome. I might expect that there would be a range of understanding of danger signs, comprising no knowledge, minimal knowledge, some knowledge, moderate knowledge and high knowledge (for example). A continuous or ordinal score would be more appropriate. How this is assessed in this systematic review is largely dependent on the included studies and the authors should examine how the individual studies determined this.
Response: We appreciated this feedback. All studies categorized knowledge of neonatal danger signs as having good knowledge and poor knowledge. They didn’t consider it as ordinal variable. The detail information how knowledge of neonatal danger sign was operationalize is described in the revised clean version of the manuscript.

3) I would suggest a review of the data abstraction. A brief review of one of the included studies (Misgna et al, 2014) found that the only mention of Neonatal Danger Signs in the Results section of this particular paper was the following: "Study subjects are asked to their knowledge of newborn danger signs using seven newborn danger signs(Poor sucking or unable to breast feed, Fast breathing, Severe chest in drawing, Hypothermia, Fever, Difficulty in movements or lethargy/unconsciousness, severe umbilical infection, redness of skin around the cord and foul smelling discharge) and 148(50 %) of them stated three and below. " However, the authors (of this systematic review) indicated that the prevalence of "Maternal knowledge towards newborn danger signs" (Figure 2) was 80.4%. From this paper, 80.4% was attributed to mothers' knowledge of essential care of the newborn (not danger signs).
Response: We accepted your comment. We again verified our data abstraction and we tried to update it and incorporate it in the revised clean version of the manuscript.

4) Minor Comments:
Introduction: Line 35: Please define 'NMR' and 'SDG' at first use in the manuscript
Methods: Page 7, Line 4 to 17: Please use appropriate brackets to clarify the limits of the OR and AND relations of the search terms. How were these search terms derived? Some terms, such as, 'cyanosis' or 'difficulty breathing' are absent. Were the neonatal danger signs standardized among studies or is there an accepted set of danger signs? Recognizing that the intent of the paper was to evaluate the specific point prevalence of knowledge of neonatal danger signs in in Ethiopia, this is a fairly narrow focus. Did the authors consider a broader
approach, such as considering studies from other countries in the region so that the results can be more broadly applicable? Lines 47: Outcomes: Is knowledge of neonatal danger signs a binary evaluation (Yes/No)? On Line 50, the outcome is clarified by stating that they wish to estimate the pooled prevalence of 'having good knowledge of neonatal danger signs' - how was 'good knowledge' determined? Page 10, Line 35 (figure 1): how many studies were excluded due to inaccessibility of the full text? This can usually be rectified by contacting the primary author Page 13, Line 37: Were the subgroup analyses pre-planned? Eg. Estimating the prevalence of maternal knowledge toward danger signs Table 1: Line 30: The reference for Melkamu B et al does not correspond to reference # 21 same for Tesfaye et al and reference #22 same for Abera et al and reference #20

Response: Thanks for your comment. We accepted your comment. We incorporated all the given comments in the revised clean version of the manuscript. All studies dichotomize knowledge of neonatal danger signs as good knowledge and poor knowledge (for all articles). We clearly put in the revised clean version of the manuscript. Subgroup analysis in systematic review is not planned rather if there is moderate and marked heterogeneity after running the pooled prevalence using random effect, sub group analysis will be computed. All the references were amended accordingly. We contacted the author three times but unable to get response for only one articles.

Response for Elizabeth Gathoni Kibaru, M.B.Ch.B, M.MED (Paeds) (Reviewer 2):

Specifically:

Q1: There are a lot of grammatical errors in the manuscript
Response: We appreciated the feedback. We accepted and corrected it accordingly. Generally we all the authors did in collaboration with Teaching English as foreign language instructors of Woldia University to modify grammatical errors related to the manuscript.

Q2: from the title the authors needs to be specific on the mothers.
Response: We appreciated the feedback. We accepted and corrected it accordingly. We focused only on women’s knowledge towards neonatal danger signs.

Q3: page 1-line 10- danger signs are not the cause of mortality but a sign easily recognized to denote danger, line 13- unclear sentence.
Response: We appreciated the feedback. We accepted and modified it and incorporated in revised clean version of the manuscript.

Q4: line 30th-which mothers and how you did get the prevalence of knowledge yet they are more than 10 danger signs. Which number indicate good knowledge or poor knowledge
Response: We appreciated the feedback. We accepted and incorporated in detail on the revised clean version of the manuscript. We clearly put how each single study categorizes knowledge as good and poor. This study focuses on the predictors and pooled prevalence of good knowledge

Q5: line 40 -factors associated with which knowledge good or poor
Response: Thanks for your comment. In the systematic review and meta-analysis knowledge of neonatal danger signs were dichotomize as good and poor. Our outcome of interest is good knowledge of neonatal danger signs since all studies which were analyzed in each factor
consider good knowledge of neonatal danger signs as their outcome of interest. Therefore we did meta-analysis on the outcome of good knowledge.

Q6: line 40-neonatal deaths by 2030 will be??
Response: thanks for your comment. It is to mean that by 2030 SDG plans to reduce neonatal mortality as low as 12/1000 live births and it was rewrote in the main text clearly.

Q7: line 40-the highest mortality occurred when?
Response: Thanks for your comment. We amended it accordingly.

Q8: page 3: what do you mean by the above danger signs????
Response: thanks for your comment. We accept and incorporated in the revised clean version of the manuscript.

Q9: line 21-with pooled regions are they not statistically representative? lines 23, 24, 25, 26-not clear line 39, 40 looks like the objectives line 43-description of the area inadequate line 23-how did you define the postnatal period line 34-how good is unpublished data and reports in a systemic review page 8 line 42 -specify which mothers the prevalence not clear was it one danger sign two or three to describe as good knowledge? Please look at Kibaru and Otara BMC Res Notes (2016) 9:481 DOI 10.1186/s13104-016-2272-3 page 15 line 37-Mass media-did you mean new papers, radios, TV? I am wondering how this was applicable in the rural areas did you include availability of the mobile phones? how accessible is it in Ethiopia.
Response: Thank you very much for your constructive comments and suggestions. We the authors tried to incorporate all the given comments in the revised clean version of the manuscript. Postnatal period is the period from delivery till 12 weeks postpartum. We include research data which is unpublished in journals but we get from university institutional repository and we assessed their quality. So those findings which had good quality were included in the analysis. Exposure to mass media is when the mother exposed to (use) at least one mass media from mass media listed like Radio, TV, Newspaper. In Ethiopia particularly in rural community Radio is common and most mothers have exposure to at least one mass media. We defined and characterized what Mass media mean in the main text of the document.

Q10: Line 59-how different were the time variation, measurements and social demographic characteristics of the study population? Please elaborate page 20 line 12 -16-is there data to justify this? Please quote studies line 25, 26, and 29, 30-already in the results. Are there other studies showing similar finding lines 28, 29, 30-unclear sentences overall comment discussion inadequate please try to compare your findings with other studies done elsewhere are there systematic reviews similar to yours and if present can you get similarities or differences it’s not clear in the studies you looked at how prevalence was arrived at unfortunately I am not able to comment on statistics.
Response: Thank you very much for your constructive comments and suggestions. We the authors tried to incorporate all the given comments in the revised clean version of the manuscript. We didn’t get systematic review and meta-analysis on knowledge of neonatal danger signs as a result we tried to discuss by comparing research finding done elsewhere out of those studies included in the analysis and country level findings which had similarities with our study findings. In principle, findings of systematic review and meta-analysis compared with similar findings at national or country level if no data results may be compared with a single study at national level. Generally we all the authors did in collaboration with Teaching English as foreign language instructors of Woldia University.
Response for Gizachew Abdissa Bulto, MSc (Reviewer 3): General comments

 Abstract: Page 3: line 9-11: “Newborn danger signs are the most common cause of neonatal mortality and morbidity.” How do you see this statement? Newborn danger signs are signs that signify the presence of severe illnesses or clinical signs.
Response: Thank you very much for your constructive comments and suggestions. We accepted your comment. We incorporate all the given comments in the revised clean version of the manuscript.

 Page 3: line 10-15: you stated: “In Ethiopia, most babies are born at home or are discharged from the hospital in the first 24 hours, increasing mother’s knowledge of the danger signs of newborn complications is of critical importance for improving newborn survival.” I think it is good if you added therefore to link these two different statements or split the statement in to two by replacing coma with full stop
Response: Thank you very much for your constructive comments and suggestions. We accepted your comment. We incorporate all the given comments in the revised clean version of the manuscript.

 Result: Page 3: line 33: add status to educational of the father
Response: Thank you very much for your constructive comments and suggestions. We accepted your comment. We incorporated all the given comments in the revised clean version of the manuscript.

 Introduction: The whole part of the introduction section should be written again, the flow of idea between each paragraph and within the same paragraph should be maintained, should be interconnected and therefore, entirely rewritten again. Mainly the authors have written about neonatal mortality but nothing about the causes, and why knowledge of neonatal danger signs? Please write your acronyms fully first and put in bracket at initial presence NMRs?, EDHS?? EMDHS??
Response: Thank you very much for your constructive comments and suggestions. We accepted your comment. We incorporated all the given comments in the revised clean version of the manuscript.

 Page 4: line 7-12: “Neonates are the most vulnerable age group of the human population. They aren’t small adults and hence need to be regarded with special nursery care than adults and even older children” what do you think the relevance of the second statement?
Response: Thank you very much for your constructive comments and suggestions. We accepted your comment and rephrase it.

 Page 4: second paragraph: line 22-32: The authors didn’t used latest data to indicate the status of neonatal mortality rate, please use the latest one (WHO 2019 report is available). Also this paragraph should be written in summarized manner than repeating the same idea twice. In the last paragraph of introduction section it is good if you replace the word women with mothers.
Response: Thank you very much for your constructive comments. We incorporate the comments.

 Methods: Page 5 line 39-43: “……to assess the pooled prevalence of knowledge of Neonatal danger signs and its associated factors in Ethiopia, 2019.” It is good if the authors add Mothers on … knowledge of mothers on Neonatal danger signs and its associated factors. Please also indicate the searching period than simply putting 2019. There are studies I have seen published in 2019 in which you have included and on the other hand there are also more
studies which you left without inclusion? This probably shows your search strategy is not exhaustive or is there a reason why you excluded them?

You have included study done by Fiseha T et al., published on October 2019, on the other hand you didn’t included other studies? This needs an explanation or you have to make your search exhaustive and try to include those remaining studies?

2. Desalegn Tesfa Asnakew, Melaku Tadege Engidaw, Alemayehu Digssie Gebremariam, Level of Knowledge About Neonatal Danger Signs and Associated Factors Among Mothers Who Delivered at Home in Fogera District, South West, Ethiopia, Biomedical Statistics and Informatics. Vol. 3, No. 4, 2018, pp. 53-60. doi: 10.11648/j.bsi.20180304.11 You included But you didn’t included:

Response: Thank you very much for your constructive comments and suggestions. We include those studies published before August first, because in systematic review and meta-analysis there is a period of data abstraction after that those studies published may not be included. So we send our manuscript on September 06/2019 by completing the overall analysis and write-up, as a result studies published from August till December was not included due to the above mentioned reason. The reason why we include study done in Harar was due to the fact that the paper was not published at the time of data abstraction but we get from Haramaya University institutional repository. But now we incorporate all published papers till December 24 and we analyze again by incorporating new three papers to increase the accuracy of the paper.

Search Strategies: Page 5: line 55-60: the authors stated they formulated the search terms from PICO questions. What is your comparators or control and intervention?
Response: Thank you very much for your constructive comments and suggestions. Our comparators Comparator(s)/control are Mothers in the reproductive age group those who know or have good knowledge about neonatal danger signs and the intervention(s) are Knowledge of neonatal danger signs. The main aim of this PICO formulating is to create a strong search engine.

Inclusion criteria: Page 6: Line 20-24: the authors stated: “Population: only studies involving postnatal women” as inclusion criteria. I think it is good if you mentioned the period (time) for postnatal mother because I have seen a study which have assessed knowledge of mothers who gave birth in the last 2 years (a research by Tesfaye, et al, 2018) and probably you can check for others.
Response: Thank you very much for your constructive comments and suggestions. The main reason to limit the time interval of postnatal women is to decrease the recall bias to increase
the precision and accuracy of the data. We included the studies done in postnatal and extended postnatal period.

Page 6: line 24-33: here the authors have included those studies which had reported magnitude of mother’s knowledge or at least one least adjusted associated factor of knowledge of neonatal danger signs among mother. But, I have tried to see some of the studies you have included in your SRMA and found that they have measured Mother’s knowledge on neonatal danger signs by using those who mentioned greater than or equal to 3 danger signs or some of them used mean value, or scoring above the median score. E.g. study done by Melese et al (17): have used “For mothers who were able to identify less than six neonatal danger signs were classified as having a low level of knowledge and those who scored more than six were classified as having a good level of knowledge on neonatal danger signs.” which has found only 11.7% of mothers had good levels of knowledge about neonatal danger sign versus Desalegn et al (16) which is 64.12%, Demis B et al(25) which is 88.86% by using median and Misgna et al(24) 80.40% responded greater than 50 % knowledge questions correctly. The authors also included studies that have assessed mother’s knowledge on essential newborn care and associated factors which is impossible to use for determining the pooled magnitude or prevalence of neonatal danger sign and its associated factors. Here I strongly recommend them to exclude those studies and only to use studies which have assessed knowledge of neonatal danger signs and associated factors. [E.g. Misgna et al (24), Demis B et al (25)]

Response: Thank you very much for your constructive comments and suggestions. We tried to include all detail information regarding how each included studies operationalize knowledge of neonatal danger signs under table of the revised clean version and we tried to perform sub-group analysis by considering their measurement of the outcome variables.

Data extraction: Page 7: line 6-22: it is good if the authors appended their data extraction tool as additional file.

Response: Thank you very much for your suggestions. We will try to send the data extraction tool after the manuscript will be accepted for potential publication unless we are unable to send since it will raise copyright issue. As to the policy of the journals datasets will be sending to the reviewers and editorial teams after the manuscript has getting Q1 version acceptance.

Quality assessment: Page 7: line 30-36: The authors stated, “The methodological quality of the study, comparability of the study and the outcome and statistical analysis of the study were the three major assessment tools we used to declare the quality of the study.” The concern is how they handled the statistical analysis variations for determining their outcome variable among those included studies?

Response: Thank you. We assess included study with respect to methodology, comparability of the study and statistical analysis and we tried to clearly put under table 1. We the authors tried to see the statistical quality of each paper by NOS appraisal tools. If the reason is a difference between authors, the second team authors checking, finally problems were resolved by discussion. For more information we send the NOS checklist for all studies.
Page 7: line 35-45: you stated: “Last, studies scored a scale of ≥ 7 out of 10 was considered as achieving high quality…………. All of the studies were included based on the Newcastle-Ottawa Scale quality assessment criteria.” Please attach your quality assessment of articles included as additional file.
Response: Thank you very much for your suggestions. We will attach the quality assessment criteria as an additional file.

Data processing and analysis: Page 7 line 50-60: authors have computed “Cochrane Q-test and I2 statistics to assess heterogeneity among studies and found their results showed there is significant heterogeneity among studies (I2 = 99.7%, p <0.001).” • It is known that if the value of I2 is 75% we should be very concerned, but if the value is 100% it indicates as there is substantial heterogeneity and the appropriateness of undertaking meta-analysis should be questioned. I think it is good if you have excluded those studies which are conducted on knowledge of essential newborn care and try to address other concerns mentioned under inclusion and exclusion criteria.
Response: Thank you very much for your suggestions. We tried to compute Cochrane Q-test and I2 to assess heterogeneity, based on this there was heterogeneity in our SRMA after that we conduct subgroup analysis which is the recommended analysis for SRMA with strong heterogeneity i.e 99.6%. As per the authors best knowledge, we need a reference that said avoid or exclude studies if Q-test and I2 is near 100. Studies should be removed, if and only if the quality is below the appraisal values based on the type of tool it may be NOS, JBI, MOOSE-----. Otherwise studies will not be excluded after analysis, if we faced marked heterogeneity rather doing sub group analysis and show the gap of the studies.

Results: Page 8: line 23-28: the authors stated as they have retrieved 563 articles, but when I do the same thing on PubMed using the same terms there are 1308 articles retrieved. How the authors do reported only 563 articles? “In the first step of our search, 563 articles were retrieved regarding the prevalence and associated factors of knowledge among postnatal women at PubMed, Google Scholar, Science Direct, and other sources described previously.”
Response: Thank you very much for your suggestions. We refuse your comments because you can search again in PubMed by using our search strategies. For your information, we retrieved only 399 articles while we search in PubMed by using this ‘((Knowledge OR Awareness OR Understanding) AND (“Neonatal danger signs” OR “newborn danger signs” OR “Warning signs of newborn” OR “Neonatal warning signs” OR “Unable to breastfeeding” OR “Convulsion” OR “Lethargy” OR “Difficulty in breathing” OR “Jaundice” OR “Hypothermia” OR “Hyperthermia” OR “Pus discharge” OR “Repeated Vomiting”) AND (“Mother’s” OR “Women”) AND (“Associated factors”) AND (Ethiopia))’ and by using other search engines like Google scholars, Hinari, Web of Science, Maternity and Infant Care and Wiley Online Library by incorporating other related terms we retrieved a total of 566 after considered three papers which was suggested by you.

Page 8: line 32-38: revise the statement it seems incomplete? What are those reasons? “Therefore, 60 full-text articles were accessed and assessed for eligibility based on the pre-set criteria, which resulted in the further exclusion of 49 articles primarily due to reason.”
Response: Thank you very much for your suggestions. We incorporated in the revised version of manuscript.
Page 10: line 9-12: authors stated: “Regarding quality score, the quality score of each original study ranged from a low of five to a high of eight (Table 1) and on Page 7: line 35-39: Last, studies scored a scale of ≥ 7 out of 10 was considered as achieving high quality.” How do you see the quality of included studies in your SRMA?
Response: Thank you very much. This is edition error and the quality of each study was assessed and we will send the quality score as an additional file.

Page 12-19: I think the authors have to correct the issues raised above under the inclusion criteria!
Have you conducted or check subgroup analysis based on the original articles study setting community Vs Institution based?
Response: Thank you very much. We conducted subgroup analysis with respect to the study setting and the result was put under table 2.

Discussion: Page 19: line 39-45: “Inadequate knowledge of parents during the neonatal period may….. which intimidates the neonatal health and could yet lead to neonatal morbidity and mortality.” Better if rephrased as inadequate knowledge of parents on neonatal danger signs during….. to be specific.
Response: Thank you very much. We amended and modified the discussion section accordingly.

Page 19: line 46-55: “In this review, the overall pooled prevalence rate of maternal knowledge on neonatal danger sign was 40.16(95% CI =39.11, 41.2). The overall pooled prevalence of levels of mother’s knowledge towards neonatal danger signs was 40.16% at the national level.” The authors repeated the same result twice, remove one statement because almost they are the same.
Response: Thank you very much. We accepted your comment.

Page 19: line 53-60: “This Meta-analysis finding is higher than the study done in Malawi 29% (27), Afghanistan (28%) (28) and Ghana (20.3%) (29). This might be due to variation in time, measurement of newborn danger signs and socio-demographic characteristics of the study population.” How you compare your finding of SRMA with the findings of primary studies???? Your discussion is also not strong and needs to be written again with most possible/strong scientific explanations.
Response: Thank you very much. We accept your comment. We didn’t get systematic review and meta-analysis on knowledge of neonatal danger signs as a result we tried to discuss by comparing research finding done elsewhere out of those studies included in the analysis and country level findings which had similarities with our study findings. In principle, findings of systematic review and meta-analysis compared with similar findings at national or country level if no data results may be compared with a single study at national level.

Page 20: line 4-19: “The prevalence of maternal knowledge towards neonatal danger sign was higher in Addis Ababa and Harar regions as compared to other regions with subgroup analysis.” “…… Therefore, the prevalence of maternal knowledge on newborn danger signs was varying within the regions.” Why authors conducted subgroup analysis of articles from Addis Ababa city administration and Harari regional state together? Also see the comments above about the issue of including the study done in Addis Ababa and others before concluding there is regional variation in the knowledge of neonatal danger signs?
Response: Thank you very much. It is already changed. We totally amended the sub group analysis. We conduct subgroup analysis with respect to study setting and sample size.
Page 20: line 34-53: how do you see comparing your finding with the results of primary articles published elsewhere?? Again you have mentioned: “This might be due to the fact that educated mothers had the ability to acquire the knowledge of newborn danger signs through their formal education and mass media exposure on health information dissemination programme.” Do you think mothers do get knowledge of newborn danger signs through formal education?
Response: Thank you very much. As we know education is not restricted to the four wall of the class. There will be knowledge acquiring through education exposure to media as well as reading posters, newspapers, TV and radio.

In general your discussion needs thorough revision, please don’t discuss your finding with unrelated articles??? E.g. page 21 line 38-42: “This finding is supported by the studies conducted in Bangladesh (31) and North West Ethiopia (36).” And there are also others cited within your discussion?
Response: Thank you very much. We accepted your comments and modified the paper.

Limitation and strength of the study: Page 22: The authors mentioned as they have considered mothers as knowledgeable: “….. articles which assessed the level of mother’s knowledge using ‘at least one and above spontaneous responses’ and ‘above mean responses’ making it difficult to pool the level of knowledge together…” how do you see including those studies which have assessed mothers knowledge with at least one danger sign versus mean (6 or more danger signs) or with median and above and those who mentioned 3 or more???
Response: Thank you very much. We put in detain in the revised clean version of the manuscript.

Abbreviations: Page 22: line 38-42: I do not think it is important to list those all under your abbreviations because most of them appeared only once or twice in the text.
Response: Thank you very much. We accept your comment.

I am not able to see the PRISMA checklist used for this SRMA because it couldn’t be downloaded.
Generally this SRMA needs: Serious English edition! Can be considered for publication if the authors can address raised issues
Response: Thank you very much. We already attached PRISMA checklist and we will also send again at the time of submission. Generally, we all the authors did in collaboration with Teaching English as foreign language instructors of Woldia University concerning English edition.