Author’s response to reviews

Title: Magnitude and predictors of undernutrition among children aged six to fifty nine months in Ethiopia: a cross sectional study

Authors:

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Author’s response to reviews:

Author’s response for reviewer’s comment

Dear reviewer, we thank you for reviewing and providing us with invaluable and crucial comments that helped us to enrich our manuscript. Really we are happy to your comments and we have got an important education from the comments. Based on your suggestions we tried to incorporate the comments to the manuscript and we also provide point by point response in the following table.

Title: Magnitude and predictors of undernutrition among children aged six to fifty nine months in Hawassa town, Southern Ethiopian: a cross sectional study

Corresponding Author: Hiwot Darsene

Comments by Reviewer 1

<table>
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<th>Sec</th>
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<tr>
<td>1</td>
<td>Please mention novelty of this study.</td>
<td>Thank you, we accept your comment and we summarize the abstract and it was shortened.</td>
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<td>2</td>
<td>There is a lot of repetition (eg ethical considerations) and certain sections can be amalgamated and shortened (eg methods)</td>
<td>Thank you, we accept the comment and the repetition of ethics section is done to make the paper to be in line with the journal standard. We amalgamated and shortened the method part as much as possible.</td>
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</table>
Background (page 5) Line 23. Is it 6-59 months?  
Thank you, we accept the comment and we made it 5-59 months.

Participants Exclusion criteria are not clear. ie. If a child is having learning difficulties without deformities, taking anthropometric measurements is not difficult. The word mentally retarded is hardly used now.  
Thank you, we accept the comment and we incorporated the comments by making exclusion criteria those children with body deformity that poses difficulties during anthropometric measurement. We changed the word ‘mentally retarded’.

Sampling techniques  
Difficult to understand the sampling methods, suggest to put it in diagrammatic form.  
Thank you, we accept the comment and we used diagram to make sampling method clear.

Results  
Table 4- Complementary feeding typically covers the 6-24 months according to WHO. Is it suitable to consider children beyond 24 months in to this categorization?  
Thank you, we accept the comment and we used this categorization because this classification indicates only the children’s feeding practice in the first 24months that is obtained by asking the history. The history was asked for the first 24months of their age and it did not represent the case beyond 24moths of age.

Discussion  
Page 11, line 48 Reason for lower prevalence could be taking only one child from one family. Is it the same methodology employed to collect EDHS data?  
Thank you, we accept your comment but not the same methodology was employed however, since the EDHS was also conducted in the same area there was no difference whether one child or more were included in to the study. Therefore, we prefer not to change the reference.

Grammar and spelling mistakes need more attention  
Thank you, we accept the comment and the manuscript was edited by English language speaker after some modification was made by the authors based on the reviewers and editors suggestion.

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Comments by Reviewer 2

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<td></td>
<td>Malnutrition is a big problem for any part of the world so the data collection and the research on this area e.g. malnutrition among under five is needed in all the geographical areas of the world. Keep it up</td>
<td>Thank you, we accept your encouragement</td>
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Comments by Reviewer 3

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<tr>
<td>1.</td>
<td>Title: The age group stated in the title is not in accordance/harmonious with what is being discussed in the manuscript. May revise the</td>
<td>Thank you, we accept the comment and we revised the title as “Magnitude and predictors of undernutrition among</td>
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...
title of the article to "Prevalence and Predictors of Undernutrition among Children Aged Six to Fifty Nine Months in Rural Kebeles of the Hawassa Town, Southern Ethiopia: A Cross Sectional Study".

Consider providing conclusion on the prevalence and predictors of children undernutrition in the study area (i.e. underweight, wasting) and not just on stunting.

Use the word 'determine' instead of 'assess' in stating the objective of the study in the Abstract Section.

Provide an explanation or justification why the study area was chosen to answer the objective of the study.

Spell out the acronyms/abbreviations in the manuscript when using it for the first time (e.g. SNNRP, EDHS).

Improve the coherence/transition of ideas/flow of discussion in the background/introduction especially the last two paragraphs.

Consider including Operational Definition section and define the following: kebeles, Sidamigna, Chembelala and diarrheal morbidity.

Provide a more detailed methodology.

In the paper, it was specified that there were 15,723 under-five children based on the 2007 children aged six to fifty nine months in Hawassa town, Southern Ethiopian: a cross sectional study” based on your suggestion.

Thank you, we accept the comment and we provided conclusion that contain underweight, stunting and wasting.

Thank you, we accept the comment and we used the word determine instead of assess in the objective.

Thank you, we accept the comment and we provided justification of the study that there were no study results that indicate prevalence and predictors of undernutrition in the study area even though there was high prevalence of undernutrition in Ethiopia.

Thank you, we accept the comment and we spelled out the abbreviations when they first used.

Thank you, we accept the comment and we tried to improve the coherence of ideas as much as possible.

Thank you, we accept the comment and we included operational definition section and we defined commonly used terms.

Thank you, we accept the comment and we included the population of the study
National Census. This should not be the population (N) of the study. Indicate the N of 6-59 months old children in the study area. (N) =15,219 in to this section.

b Were the children without mothers, but with fathers/guardians excluded from the study? Thank you, we accept the comment and we corrected the sentence that children with guardians (male or female) were also included in to the study.

c What is the basis for the design effect of 2 in computing the sample size? Please indicate the reference or basis of assumption. Thank you, we accept the comment and we used design effect of 2 since multistage sampling technique was employed; we also provided reference for similar study.

d Consider using of a flow diagram for the sampling method. Thank you, we accept the comment and we used flow diagram to clearly indicate the sampling method.

e Why only one child was selected per household? Thank you, we accept the comment and we prefer to include only one child per household (based on reference), because it is a rare case to find more than a child in a household.

f Indicate the single population proportion formula used in the computation of the sample size. Thank you, we accept the comment and we indicated the formula in the manuscript.

g Describe the process of anthropometric measurement in the Data Collection section and not in the Study Variables section. Thank you, we accept the comment and we described anthropometric measurement in the Data Collection section as per your suggestion.

h Describe the analysis of anthropometric measurement in the Data Analysis section and not in the Study Variables section. Thank you, we accept the comment and we described the analysis of anthropometric measurement in the Data Analysis section as per your suggestion.

i Indicate which cut-off points was used for classifying the nutritional status of the children (e.g. WHO classification, local classification of nutritional status for
children, etc.)?

k Describe how Chembelala works in computing for the child's age.

Thank you, we accept the comment and we used Chembelala and other local calendars method to estimate the age of the children for which any age record couldn’t be obtained.

l Explain why different methods (i.e. base on the vaccination card and Chembelala) were used for the computation of the children's age.

Thank you, we accept the comment and we used Chembelala and other local calendars method to estimate the age of the children only if there were no records about the age of the children. As it was explained in the manuscript, for children who have vaccination card or any age record, we used the record to know the age of the children.

m Indicate the instrument used in measuring the weight of the children older than two years old.

Thank you, we accept the comment and we used seca digital weight scale and we incorporated the instrument we used to measure weight of older children into the manuscript.

n Provide a more detailed specification of the equipment (e.g. brand, measure of precision, measures up to 150 kg, etc.) used in measuring the height and weight of the children.

Thank you, we accept the comment and we used the height board UNICEF brand weight was measured by hanging weight scale for children younger than 2 years and Seca digital weight scale older children.

o Check with WHO, UNICEF or local policies/guidelines if the instruments/equipment used for measuring the height and weight of the children are recommended for conducting a scientific study.

Thank you, we accept the comment and we used Standardized tool; UNICEF

p Like the weighing scales, were the equipment used for measuring the height of the children also calibrated?

Thank you, we accept the comment and we yes it was calibrated upon every case examination
Did you use SPSS 17 or 16 in the statistical analysis? In the abstract, it was specified that you used SPSS 17 while in the manuscript it was SPSS 16. Same with the data management program used. Did you use EPI info 6.04 or version 3.5?

What are the professions of the three public health professionals hired to supervise the data collection? Why are the investigators not the ones who supervised the data collection?

Indicate the reason for non-participation/response of the participant.

Use other terms for the words 'mentally retarded' and 'illiterate'.

The study was conducted in August to September 2012. Will the result of the study still be relevant to the area?

Results
Polish the order of presentation of findings in the Results section. May consider discussing the findings in the manuscript in an order that is harmonious with how the findings were presented in the tables.

Discuss of demographics of children and mothers separately.
15 Leave the actual number of the participants in the tables for reference. Discuss only the results in prevalence/percentages in the manuscript.

Thank you, we accept the comment and we wrote actual number by describing the percentage in bracket instead of writing them separately to confront with the journal standard.

16 Did you conduct bivariate logistic regression analysis? What method did you used?

Thank you, we accept the comment and we described in the paper that we used both bivariate and multivariable analysis to assess factors associated with undernutrition. First we conducted bivariate analysis and those factors found to be associated to under nutrition at P-value of 0.2 were taken to multivariate analysis.

17 What is the relevance of asking the birth order of the last child?

Thank you, we accept the comment and this question was asked to identify whether the last child is the first, second and third or more child for the family. This concept is relevant because as the number of the children is increased in family pay less attention for their children’s feeding

18 Show the results of the test for association of all indicated independent variables and dependent variables even though they are not significantly associated.

Thank you, we accept the comment and we presented all the variables that have significant association with dependent variable. However, it was not found important to include variables that have not significantly associated with dependent variables into the association result.

19 Indicate the p-value in the tables.

Thank you, we accept the comment and we indicated the p-values in the table of association.

20 Do not interchange undernutrition with underweight, wasting or stunting in the discussion.

Thank you, we accept the comment and we corrected the comment accordingly.
Highlight all significantly associated factors/predictors of underweight, wasting or stunting among children in the Results section. Thank you, we accept the comment and we highlighted all significantly associated factors in the table.

The duration of the breastfeeding seems to be significantly associated in all types of undernutrition looked into in the study. How were children aged 6-23 months classified? Were they excluded in the test for the association of undernutrition (e.g. stunting, underweight, wasting) and duration of the breastfeeding? Or did they just fall under "Less than two years"? Thank you, we accept the comment and this question is about duration of breastfeeding and is not about complementary feeding. WHO recommends a child should feed on breast milk for at least 24 months of age. Therefore, children aged 6-23 months were classified to “less than two years”

Indicate number of participants with missing data for each variable of interest, if any. Thank you, we accept the comment and participants with missing data were not included into analyses and they were considered as non-response.

What do you mean by 'Diarrheal morbidity in the last year'? Does it mean 'Diarrheal morbidity in 2011'? Or did it only pertain to 'in the past 12 months'? Thank you, we accept the comment and we changed 'Diarrheal morbidity in the last year' in to 'Diarrheal morbidity in the past 12 months'

Replace 'colostrums feeding' with 'colostrum feeding'. Thank you, we accept the comment and we replaced 'colostrums feeding' with 'colostrum feeding'

Discussion
Improve the cohesion and flow of ideas in the Discussion section. Thank you, we accept the comment and we tried to improve the cohesion of ideas in discussion

Provide possible explanations for the association of undernutrition (i.e. underweight, wasting or stunting) and all its predictors found in the study. Thank you, we accept the comment and we provided possible explanations for the association of undernutrition.

Cite the literature reviewed for all the claims or possible reasons provided in the Discussion section even though it seems 'obvious' (e.g. educated mothers being more Thank you, we accept the comment and we found it unimportant to provide Citation or literature reviewed reference for the claims or possible reasons
autonomous in the allocation of money; family with more children experience more economic strain; inadequate intake of breast milk nutrients that increases the risk of undernutrition; diarrhea may result in lower appetite and poor digestion and malabsorption; colostrum is full of nutrients and antibodies, etc.)

provided in the Discussion section since it is the authors’ explanation about the possible association.

29 Expound the similarities found in other literature.

Thank you, we accept the comment and we incorporated the comments accordingly.

30 Provide a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.

Thank you, we accept the comment and we incorporated the comments accordingly.

31 Discuss

How the study results can be applied in other settings/areas.

Thank you, we accept the comment and we incorporated the comments accordingly.

32 Conclusion

Provide a summary of the key results and provide conclusion based on the objectives of the study.

Thank you, we accept the comment and we tried to provide conclusion based on the study objective and key findings.

33 Limitation

Improve the Limitation of the Study section of the article. May only include the 3rd point as the limitation of the study.

Thank you, we accept the comment however, we already stated the potential biases (recall bias) that affected the result of this study. Being cross sectional study is also a good limitation.

34 Take into account all possible sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.

Thank you, we accept the comment and we added the abbreviations that are missed and we deleted those abbreviations that are not used in the
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<td>In general, it is an interesting article that is nicely structured and clearly written. Although English is not my native language, I observe that the text could be improved by someone with a good English competency. The methodology is mainly good described, although some details could be added and some limitations of the methodology (discussion) could be some more elaborated. In general, the discussion is quite much a repetition of earlier described findings. It would add value to the discussion if certain specific thoughts and facts from the literature (related to the Ethiopian situation) could be added to this discussion. E.g. any knowledge related to most common (elsewhere described) prevalence of type of malnutrition (kwashiorkor and/or marasmus) and causes of malnutrition, caused of</td>
<td>Thank you, we accept your encouragement and the manuscript was edited for English language by native English language speaker after the investigators incorporated the reviewers suggestion. Thank you, we accept your comment and the methodology part is thoroughly revised by incorporating reviewers’ comments Thank you, we accept your comment and the it is better had kwashiorkor and/or marasmus and causes of diarrhea been added to this study. However, this study was aimed at assessing prevalence and predictors of undernutrition. The clinical part was not the current objective of this study and it was recommended in the conclusion part.</td>
</tr>
</tbody>
</table>
diarrhoea (use of boiled water? Bottled water? Lack of good water supply? Economic situation of this population?...).

Page 4 line 20: "Undernourished children were usually suffered from chronic illnesses" ---> undernourished children are usually suffering from chronic illnesses

Page 4 line 47: "under-nutrition" ---> idem for consistency throughout the text

Page 5 line 44: "100, 790" -->100,790; "15, 723" --> 15,723.

Page 6 line 37: "The youngest child was selected as participant during more than one eligible child was present in the selected household, and in case of twins one was taken by lottery method to be included" ---> the youngest child was selected as participant if there was more than one eligible child in the selected household,…

Page 9 line 25: 'Of the total number of mother 554 (68.3%) were housewife and only 444 (54.8%) were educated' -->In total, 554 (68.3%) of the mothers were housewife and only 444 (54.8%) were educated

Page 9 line 18-27: Seven hundred eighty one (96.3%) of the children were grown by both parents and the average household family size was 5.73 with the (SD + 2). nearly all of the study participants 794(97.9%) were Sidama by ethnicity. Of the total number of mother 554 (68.3%) were housewife and only 444 (54.8%) were educated. Seven hundred twenty
(88.8%) of children belongs to Christian families. (Table 1)

-->If number above 10, use the numerical system instead of words (781, 720). Also to be applied in the text below.

-->"5.73 with the (SD + 2)" can be "5.73 (SD + 2)."

-->nearly all of the study participants 794(97.9%) were Sidama by ethnicity: Nearly all of the study participants were Sidama by ethnicity (97.9%).

Page 13 line 24: "Children who born in less than 24.." --> Children who were born in less than 24… or: Children born in less than 24 …

Page 13 line 42: "Children who fed on their mother's breast for less than 2years were…” --> "Children breastfed for less than 2 years were…”

2 Methods:

Page 5 line 32: is it 6 months (or 5 moths, as mentioned in the abstract?) - to check out in abstract versus design section and rest of the article

Page 5 line 56 "The source population of this study was all six to fifty nine months old children paired with their mothers who lived in rural kebeles of Tulla sub-city, Hawasa town." Can be deleted as it is a repetition of the sentence above

Page 6: The authors mention that a systematic sampling (choosing the youngest if more eligible children) is used. On the other hand, a predictor "birth order" is included in the model. Could the
authors reflect to which extent eventual associations might be biased if a selection criteria influences an independent variable?

Pag 7 line 39: ENA stands for ….?

Thank you, we accept your comment and we wrote the full word that represents ENA and we also included it in the abbreviation.

Pag 8 line 3: "multivariate" logistic regression: I assume that the authors refer to multivariable regression analyses? (Multivariate refers to analyses with taking into account different outcomes (dependent variables) at the same time; multivariable refers to analyses which take into account different independent variables at the same time)

Thank you, we accept your comment and we corrected to “Multivariable…”

3 Results:

Page 9: in general, it is not needed to repeat all descriptive results from the first two tables in text format. Only repeat the most important ones, and add some additional information like type of complementary feeding (which is not in the table). Avoid (as mention above) to write large numbers in text format (above 10, use numbers).

Table 3: add the index to "normal" --> Normal HAZ, Normal WAZ, Normal WHZ; or create an extra line to introduce the different indices (HAZ, WAZ and WHZ)

Thank you, we accept your comment and we added the indices to “normal” as your suggestion.

Page 9: bivariate and multivariate logistic regression --> I assume you mean multivariable logistic regression (multivariate= 2 or more different dependent outcomes in your analyses; multivariable= 2 or more different last child) to include in to the study. Therefore, it created no bias.

Thank you, we accept your comment and what already stated in the text is the summary, not all variables were described in the text.
independent variables)

Page 10:

AOR: for which variables exactly has been adjusted if AOR is calculated? Note: Be aware that not too many confounders are included (if they are too much correlated, or they are colliders, you might cause a bias by adjusting)

The authors have originally three outcome categories: was it feasible to analyse the data with ordinal logistic regression?

Page 11 line 3: "Risk of underweight among children whose mothers were illiterate was 0.68 times [AOR 0.68; 95%CI (0.30, 0.93)] less likely than children whose mothers were literate." --> I assume you mean the opposite? Additional remark: be consistent in terminology: do you mean "no formal education" or "illiterate", it is not necessarily similar.

Page 11 line 3: Thank you, we accept your comment and we corrected according to your suggestion. The word ‘illiterate’ was also replaced with ‘no formal education’.

Page 11: last paragraph - your kebeles do represent a specific town, probably a specific group in Ethiopia. Might it be an explanation to different prevalence compared to earlier Ethiopian research (which also refers to specific locations in Ethiopia ref13-19)?

Page 12: line 27-32: maternal age: might it be that older mothers have more

4 Discussion:

Page 12: Thank you, we accept your comment and we corrected some of your comments however, all of the references we used were conducted in a specific areas of the country similar to our study. That is why we used these references to compare our study with.

Page 11: Thank you, we accept your comment and we corrected the comments according to
children, and that therefore the children belong to larger families (and be therefore more at risk? Cf line 51-56). Or are it not related phenomenon's?

Page 13 line 22: "environmental stress": what do you refer to in this context?

Thank you, we accept your comment and we used this phrase is used to indicate that boys are more prone to environmental factors including nutrition than girls.

Page 14 line 49: "Children who fed complementary feeding for less than three times per day were more likely to be stunted, underweight and wasted than their counterparts": the content of this sentence is not related to the next sentence. Move this sentence up or down in the text. The finding that complementary feeding is associated with stunting: could it also be that complementary feeding also could be bacterial contaminated if water is not good enough boiled or no bottled water is used (higher risk of diarrhea), or that the familial economy makes that the energy and/or protein intake is reduced?

Thank you, we accept your comment and corrected the next sentence and we included your suggestion as possible contributor.

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<td>Dear Authors. This is a nice attempt but you have to correct all the grammatical errors and comments in yellow highlights as well as in the comment boxes. This is to improve understanding of your work and clear out some confusions. Comments in yellow highlights as well as in the comment boxes should be addressed.</td>
<td>Thank you, we accept your encouragement and the manuscript was edited for English language grammatical errors by native English language speaker after the investigators incorporated the reviewers suggestion. Thank you, we accept your comments and we addressed those comments given in the text highlighted by Yellow in PDF document.</td>
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