

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	COVID-19 vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study
AUTHORS	Dereje, Nebiyu; Tesfaye, Abigel; Tamene, Beamlak; Alemeshet, Dina; Abe, Haymanot; Tesfa, Nathnael; Gedion, Saron; Biruk, Tigist; Lakew, Yabets

VERSION 1 – REVIEW

REVIEWER	Tesfaye Mekonnen University of Gondar College of Medicine and Health Sciences, Environmental and Occupational Health and Safety
REVIEW RETURNED	17-Sep-2021

GENERAL COMMENTS	<p>Review report Reviewer: Tesfaye Hambisa Mekonnen, Assistant professor in public Health, University of Gondar, Ethiopia Title: COVID-19 vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study Comments and questions This is an import research area being little investigated in Ethiopia so far. Below are some of the suggestions and questions I do have for the authors.</p> <p>Abstract Line 18-participants -why the authors are selected Akaki Kality sub-city alone while Addis Ababa has more than 11 subs cities? This may limit the generatability of the results.</p> <p>Conclusions Lines 32-53 ...This was mainly due to the misconceptions..... including social-medias seems generic. I would suggest the conclusion needs to be consistent with the main findings.</p> <p>Introduction Lines 57-59- Therefore, frequent hand washing,.....to halt the spread of COVID-19....states about other prevention measures than vaccine. Although is of great importance to introduce the readers about the available prevention strategies, focusing on vaccination issues sounds more to be consistent with the topic under investigation.</p> <p>□ Literature synthesis on vaccine hesitancy and influencing factors is also less stressed in introduction section. The authors would better show in-depth the readers regarding uptake and factors of vaccine use in the global and local context to tell us why this study was initiated</p> <p>Methods and Materials Study design and participants Line 103...Multi-stage sampling technique...if, so design effect is required to calculate effective sample size.</p>
-------------------------	---

	<p>Line 139---Multicollinearity was assessed....value of VIF needed Line 140-141...Goodness of the...value of Hosmer and Lemshow needed Data management and analysis -The authors should tell the readers how they maintained quality of data</p> <p>Ethical consideration Lines 145-146...Ethical approval of this.....Myungsung Medical College.. provide with a reference number Line 146....the participants.. written consent...why written consent? Results The efforts to supplement quantitative with qualitative is quite shallow. Otherwise, the method employed (mixed method) would be of quite less worth in the current study. The authors should support the qualitative results exhaustively where relevant Lines 199-201...Similarly, the odds....only from mass-media....So, what should be next? Do the authors think mass media should be the only source of information to boost vaccine uptake ? If so, this contradicts with the report under COVID-19 vaccine hesitancy, Line 177 (lack of information) Line 115...Data collection tools.....indicates that practice of COVID-19 prevention measures was also assessed. However, 1) How practice has been assessed is also not mentioned in the data management section. 2) No findings presented for this variable and this also seems off the topic Discussion Lines 204-223...provides details on knowledge and attitude. But this section appears vague as it merely details about the knowledge and attitude towards COVID-19 in general and has nothing to explain in relation to covid 19 vaccine issues. This leads to the conclusion that the topic would better be KAP towards covid. Otherwise, the hypothesis/ objectives of the manuscript need improvement. Line 257-258-However, the study might be...recall bias and social desirability.....? How this can impact the study is not clear and, if so, what solution taken to minimize it needs explanation. Conclusions Generally, the conclusion should be affiliated with the main findings as mentioned above Figure 1: COVID-19 vaccine acceptance. I can see from the figure the variable 'child vaccination' where did you mention this in the manuscript and what is its relation to covid vaccine hesitancy? There are also several grammatical and typo errors in the manuscript Generally, the manuscript requires MAJOR revision especially in terms of design effect, evidence synthesis with the context of covid hesitancy, objective and results consistency, detail presentation of qualitative findings/what makes the study a mixed method is actually lacking, and implication of the study and presentation of sound conclusion as the results</p>
--	---

REVIEWER	Mohamed Khalis Mohammed VI University of Health Sciences, International School of Public Health
REVIEW RETURNED	10-Nov-2021

GENERAL COMMENTS	The authors assessed the level of COVID-19 vaccine hesitancy and its associated factors in Addis Ababa, Ethiopia. My comments are as follows. - The introduction is long; I suggest shortening it. For example, lines
-------------------------	---

	<p>53-63: all of this information is very well known, hence does not add anything to the manuscript, now that most people know more about covid than any other infectious disease.</p> <ul style="list-style-type: none"> - State the procedure that has been used to formulate the questionnaire. There is only one phrase mentioning “Data was collected by using a semi-structured questionnaire which was adapted from reviewed literatures [10, 12, 13]”. - State whether the questionnaire was subjected to psychometric analysis before being administered. The methods section should provide the validity and reliability of the survey. - Data management and analysis: the authors should provide more details about variables included in statistical models? Variables of adjustment should be listed in this section and in the footnote of Table 2. - Please comment further on the study population and whether they are representative of the general population. Is the high proportion of females (71.9%), for example, comparable to the general population? - Lines 53-63: Please provide, in detail, the data collected in each component. - Line 108: I think Malaysia is upper middle-income country not low-income country. Please check!!! - Authors stated some limitations of this study. Please, address why this study is still valid and of value to the field with such limitations. - Lacking strengths of this study. - References: most of the references are dated 2020, authors might want to conduct a recent literature review to update their literature.
--	--

VERSION 1 – AUTHOR RESPONSE

Reviewer 1: Abstract

Line 18-participants -why the authors are selected Akaki Kality sub-city alone while Addis Ababa has more than 11 subs cities? This may limit the generatability of the results.

Response: Yes, there are 11 sub-cities in Addis Ababa. For the sake of feasibility, we have conducted our study in Akaki Kality sub-city, which might not be representative of the entire city. We have noted this as one of the limitations of the study.

Reviewer 1: Conclusions

Lines 32-53 ...This was mainly due to the misconceptions..... including social-medias seems generic. I would suggest the conclusion needs to be consistent with the main findings.

Response: Thank you for the comment. We now have revised the conclusions accordingly.

Reviewer 1: Introduction

Lines 57-59- Therefore, frequent hand washing,.....to halt the spread of COVID-19....states about other prevention measures than vaccine. Although is of great importance to introduce the readers about the available prevention strategies, focusing on vaccination issues sounds more to be consistent with the topic under investigation.

Response: Thank you for the comment. We now have revised the introductory section to emphasize on the vaccination.

Reviewer 1: Literature synthesis on vaccine hesitancy and influencing factors is also less stressed in introduction section.

The authors would better show in-depth the readers regarding uptake and factors of vaccine use in the global and local context to tell us why this study was initiated

Response: During the time of initiating this study, COVID vaccine hesitancy was new, and only a little was known. Unfortunately, this paper has taken long time while processing for publication. However, we have now included some more articles to provide highlights on the uptake and influencing factors of the COVID vaccination.

Reviewer 1: Methods and Materials

Study design and participants

Line 103...Multi-stage sampling technique...if, so design effect is required to calculate effective sample size.

Response: Consideration of design effect might not be required in our study. As suggested by Kish, Design effect is unnecessary when the source population is closely independent and identically distributed. It is also less useful when the sample size is relatively small (at least partially, for practical reasons). It is also suggested that if standard errors are needed for only a handful of statistics, it may be okay to ignore the design effect.

Reviewer 1: Line 139----Multicollinearity was assessed....value of VIF needed

Response: Thank you. The VIF value is now included.

Reviewer 1: Line 140-141...Goodness of the...value of Hosmer and Lemshow needed

Response: Thank you. The P value of the Hosmer and Lemshow test is included.

Reviewer 1: Data management and analysis

The authors should tell the readers how they maintained quality of data

Response: Thank you for the comment. Data quality assurance activities were carried-out during the design, conduct and analysis. The study instruments (questionnaire and the in-depth interview guide) were adapted from similar previously conducted studies, and they were translated into local language. The data collectors were trained and supervised during the field work. Data processing and analysis have also passed different quality assurance methods (e.g., checking for completeness or missing values, consistency, coding, summary analysis, multivariable analysis). All these procedures have been stated in sections where applicable.

Reviewer 1: Ethical consideration

Lines 145-146...Ethical approval of this.....Myungsung Medical College.. provide with a reference number

Line 146...the participants.. written consent...why written consent?

Response: Thank you. The reference number is now included. Written consent is preferred to verbal consent if the participants agree to do so.

Reviewer 1: Results

The efforts to supplement quantitative with qualitative is quite shallow. Otherwise, the method employed (mixed method) would be of quite less worth in the current study. The authors should support the qualitative results exhaustively where relevant.

Response: Thank you for the comment. The purpose of including the qualitative part of the study was to explore more in-depth on the reasons why the participants hesitate to receive the COVID vaccines. We have now included more details on the qualitative findings.

Reviewer 1: Lines 199-201...Similarly, the odds....only from mass-media....So, what should be next? Do the authors think mass media should be the only source of information to boost vaccine uptake? If so, this contradicts with the report under COVID-19 vaccine hesitancy, Line 177 (lack of information).

Response: Thank you for the comment. We have omitted the word "only" from the statement to avoid confusion. The intent of the statement was not to state that mass-media should be the only source of information, but we believe it should be the primary source of information. As compared to social media outlets, reliable information is often released by mass-media.

Reviewer 1: Line 115...Data collection tools.....indicates that practice of COVID-19 prevention measures was also assessed. However, 1) How practice has been assessed is also not mentioned in the data management section. 2) No findings presented for this variable and this also seems off the topic

Response: Thank you for the comment. We have now removed this, as we did not assess the practice of the preventive measures in this paper.

Reviewer 1: Discussion

Lines 204-223...provides details on knowledge and attitude. But this section appears vague as it merely details about the knowledge and attitude towards COVID-19 in general and has nothing to explain in relation to covid 19 vaccine issues. This leads to the conclusion that the topic would better be KAP towards covid. Otherwise, the hypothesis/ objectives of the manuscript need improvement.

Response: As you rightly stated the paragraph speaks about the knowledge and attitude towards COVID 19 and its preventive mechanisms, including the vaccination. We believe this is fundamental reason either to receive the vaccine or not, and worthy to be discussed.

Reviewer 1: Line 257-258-However, the study might be...recall bias and social desirability.....? How this can impact the study is not clear and, if so, what solution taken to minimize it needs explanation.

Response: Thank you. The participants may respond only positive answers for the attitude and practice questions if they do not fully understand the purpose of the study (social desirability bias). To minimize this bias, it is imperative to provide explanation on the purpose of the study and assurance of the participant's anonymity to the participants prior to the administration of the interview.

Reviewer 1: Figure 1: COVID-19 vaccine acceptance. I can see from the figure the variable 'child vaccination' where did you mention this in the manuscript and what is its relation to covid vaccine hesitancy?

Response: Participant's perception on child vaccination was mentioned in the prior version of the manuscript. However, we have omitted this from the revised version as suggested to avoid confusions in this regard.

Reviewer 2: The introduction is long; I suggest shortening it. For example, lines 53-63: all of this information is very well known, hence does not add anything to the manuscript, now that most people know more about covid than any other infectious disease.

Response: Thank you for the comment. We now have revised the introductory section to address the comments of the reviewers.

Reviewer 2: State the procedure that has been used to formulate the questionnaire. There is only one phrase mentioning "Data was collected by using a semi-structured questionnaire which was adapted from reviewed literatures [10, 12, 13]". State whether the questionnaire was subjected to psychometric analysis before being administered. The methods section should provide the validity and reliability of the survey.

Response: Thank you for the comment. We adapted the questionnaire after reviewing similar studies. Then, the content of the questionnaire was validated by senior experts in the field. Moreover, we have translated the questionnaire to a local language.

Reviewer 2: Data management and analysis: the authors should provide more details about variables included in statistical models? Variables of adjustment should be listed in this section and in the footnote of Table 2.

Response: Thank you. We now have stated the variables included in the model.

Reviewer 2: Please comment further on the study population and whether they are representative of the general population. Is the high proportion of females (71.9%), for example, comparable to the general population?

Response: As rightly stated, 71.9% female population might not represent the population. This is presented as one of the limitations of the study.

Reviewer 2: Lines 53-63: Please provide, in detail, the data collected in each component.

Response: Thank you. The details of the collected data is included in the supplementary file.

Reviewer 2: Line 108: I think Malaysia is upper middle-income country not low-income country. Please check!!!

Response: Thank you. It is corrected now.

Reviewer 2: Authors stated some limitations of this study. Please, address why this study is still valid and of value to the field with such limitations.

Response: Acknowledging the limitations of the study is important for the readers to take cautions when they interpret the data, particularly the prevalence part. However, although there are limitations, the study findings are valid and can be used for public health interventions to address the COVID vaccine hesitancy in the country.

Reviewer 2: Lacking strengths of this study.

Response: Thank you. The strengths of the study were included in the last paragraph of the discussions section.

Reviewer 2: References: most of the references are dated 2020, authors might want to conduct a recent literature review to update their literature.

Response: Thank you. We have now updated some of the references.

VERSION 2 – REVIEW

REVIEWER	Mohamed Khalis Mohammed VI University of Health Sciences, International School of Public Health
REVIEW RETURNED	17-Mar-2022
GENERAL COMMENTS	Responses to my previous comments were acceptable.