Author’s response to reviews

Title: Health professionals’ acceptance and willingness to pay for Hepatitis B virus vaccination in Gondar City Administration Governmental Health Institutions, Northwest Ethiopia

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To: "BMC Health Services Research Editorial Office" jose.yao@springernature.com
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Subject: Point by Point Responses for Reviewers Comments- BMC Health Services Research - BHSR-D-19-00616R1

Title: Health professionals’ willingness to pay for Hepatitis B virus vaccination in Gondar City Administration Governmental Health Institutions, Northwest Ethiopia
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BMC Health Services Research

The manuscript entitled "Health professionals’ willingness to pay for Hepatitis B virus vaccination in Gondar City Administration Governmental Health Institutions, Northwest Ethiopia” was submitted to your journal for publication (Manuscript ID: BHSR-D-19-00616). The manuscript was reviewed by two reviewers, and we got very critical and important comments which helped us improve the quality of the manuscript. We would like to thank the reviewers for their excellent work in reviewing our manuscript. We made point-by-point responses for each of the comments given by the reviewers.

The following changes are made based on the reviewers’ comments and our further analysis:

1. We revised the methods section and included a sub-heading study variables in which we described the response variable and explanatory variables

2. We e-analyzed the WTP data to determine factors associated with WTP for HBV vaccination by using tobit model.
3. We revised/modified the discussion section and removed unnecessary information, and focused on the main findings of the study.

4. Overall, we critically revised the abstract, background, methodology, result, discussion section based on the reviewers’ comments.

Please see the point by point responses given below.

Sincerely

Mezgebu Yitayal
Corresponding author

Editor’s Comments
1. Your manuscript "Health professionals’ willingness to pay for Hepatitis B virus vaccination in Gondar City Administration Governmental Health Institutions, Northwest Ethiopia" (BHSR-D-19-00616R1) has been assessed by our reviewers. They have raised a number of points which we believe would improve the manuscript and may allow a revised version to be published in BMC Health Services Research.
Response: Dear Editor, thank you very much for the efforts you made to get this manuscript reviewed by the reviewers.

2. BMC Health Services Research operates a policy of open peer review, which means that you will be able to see the names of the reviewers who provided the reports via the online peer review system. We encourage you to also view the reports there, via the action links on the left-hand side of the page, to see the names of the reviewers.
Response: Dear Editor, we tried our best to incorporate the comments, suggestions and questions raised by the reviewers.

Reviewers’ Comments

Harapan Harapan (Reviewer 1)
I read the manuscript: Health professionals' willingness to pay for Hepatitis B virus vaccination in Gondar City Administration Governmental Health Institutions, Northwest Ethiopia with interest and I would like to congratulate the authors. In this study, authors tried to assess the willingness-to-pay (WTP) for Hepatitis B (Hep) vaccination among health care workers (HCWs) in Northwest Ethiopia. The topic is important giving HCW is one of the groups at risk for HepB. However, there are major and minor concerns related to this study.

Response: Dear reviewer, thank you very much for the time you spent on reviewing our manuscript. We are very grateful for your invaluable comments and suggestions, and critical questions you raised in order to improve the quality of the manuscript. We tried our best to incorporate all the comments and suggestions, and questions you raised as per our understanding.
A. Major Concerns
1. In this article, author basically did analysis WTP as standard definition which is: the maximum price at or below which a consumer will definitely buy one unit of a product. Authors defined WTP as "willing or not willing to pay for hepatitis B vaccination" This can be seen from questionnaire that they used. This seems to be Acceptance to me. Authors did collect the WTP as the maximum price at or below which a consumer will definitely buy HepB vaccination but they did not analysis them properly. Therefore I recommend authors to re-analysis their WTP data. There are many ways to analysis WTP data that have been used in the context of other vaccines including HepB vaccine (see ref below):

In addition, Contingent value method is used to measure WTP (the maximum price at or below which a consumer will definitely buy one unit of a product). Or authors should change the term, not WTP.
Response: Dear Reviewer, thank you very much for your critical and constructive comments. As per your comments, we performed re-analysis of WTP data. Please see the data processing and analysis under methods section, and table 3.

2. Please added Study Variables subheading within Methods section where authors should explain the dependent and independent variables including the definitions and how they were measured in the study. Here authors should explain for example what is medical advice, Therefore please delete operational definition subheading (the definitions should be included to study Variables subheading).
Response: It is now revised as per the comment, and we included a sub-heading ‘Study variables’ under the methods section. The sub-heading ‘Operational definition’ is now deleted, and definitions are given under the sub-heading ‘Study variables’. The term medical advice is now also defined under study variables.

3. The discussion is too long. Authors should focus on variables that were statistically significant only and to the most important findings that are associated with future prevention strategy.
Response: Thank you for the critical comment. We now revised the discussion section and we focused on the most important findings.

B. Minor Concerns
1. Abstract
1.1. Data were analysed using SPSS 20 software -- not essential information.
Response: This information is now deleted based on the comment.

1.2. …total of 423 health professionals participated -- Maybe authors need to include the groups of HCW in the bracket.
Response: (physicians, nurses, midwives, laboratory technicians/technologists, and others)
1.3. The average and above average price per vaccination -- This is not clear. Author should specify the price? This is the given price during the study not the actual price or give the actual price.
Response: This is now clarified as follows: The mean amount of money the participants were willing to pay for HBV vaccination was 325.83±283.463 ETB, and 23 (8.7%) of the participants agreed to pay below the mean, 78 (29.5%) to pay the mean, and 163 (61.7%) to pay above the mean price per vaccination.

1.4. Also I recommend author provide the value in US$ so international readers can understand easily or even all value should provide in US$.
Response: The average exchange rate during the data collection of this study was: 1 US$ = 22.6423 ETB. The result is now also presented in US$.

2. Background
2.1. It is a major public health challenge in the world infecting more than 66,000 health professionals each year -- Please provide Ref
Response: The information was obtained from reference number 1, and it is now revised.

2.2. However, vaccination against Hepatitis -- Delete However
Response: It is deleted as per the comment.

2.3. In Ethiopia, the prevalence of HBV infection in health professionals is about 9% and only 5.4% are fully vaccinated (11) -- Ambiguous. 5.4% from total HWC? Please specify
Response: Thank you for the comment. We are now revised the sentences, and included additional references.

2.4. Other study conducted --Another study
Response: Corrected.

2.5. …such as Dengue virus -- dengue virus
Response: Corrected.

2.6. perceived risk,; disease related knowledge –Revise
Response: Corrected.

2.7. Though limited evidences are available on health professionals' WTP for HBV vaccination, evidences are available on WTP for other vaccinations such as Dengue virus, tick borne Encephalitis, and Influenza. --Please add study in Zika as well as sample of re-emerging diseases (Ref: https://www.ncbi.nlm.nih.gov/pubmed/30739794/) as well as a current study on WTP in HepB (https://www.ncbi.nlm.nih.gov/pubmed/30964934)
Response: The comments are well taken and a study on Zika (Harapan H., et al., 2019) and current study on WTP in HepB (Rajamoorthy Y., 2019) are included.

2.8. However, health workers' WTP for HBV vaccination has not yet been studied in the study setting. --Please delete in the study setting
Response: The phrase “in the study setting” is now deleted.
3. Method
3.1. Please add Study Variables where authors should explain the dependent and independent variables including the definitions and how they are measured in the study
Response: A sub-heading ‘Study variables’ are added under the methods section

Study design and setting
3.2. Institution based cross sectional study design was conducted - Revise: ....study was conducted OR ... study design was employed
Response: It is corrected as per the comment

3.3. …8 health centers -- are they community health centers (Please specify because referral hospital is also can be called as health center.
Response: Health centres are health facilities staffed by around 20 professionals and provide preventive, curative, inpatient and ambulatory services, treatment of common psychiatric disorders, and dental services for 15,000-25,000 people in rural areas, and 40,000 people in urban areas.

3.4. There were about 1,529 health professionals working in these health institutions -- Please provide the group of HWC
Response: The groups of health professionals were Physicians, Nurses, Midwives, Laboratory technicians/technologists, and others)

Study population and sampling procedures
3.5. Please add definition of operational here
Response: Revised as per the comment.

3.6. …whereas health professionals who took all the three doses of hepatitis B virus vaccination (fully vaccinated), -- Please revise, for example whereas health professionals who fully vaccinated for HBV ..... 
Response: It is corrected as per the comment.

3.7. …who were already positive for the virus Please revise
Response: It is corrected as “who were HBV positive”.

3.8. …simple random sampling technique was used for --Please explain how
Response: It is now described in detail how we selected the study participants under sub-section ‘Study population and sampling procedures’.

Operational definition
3.9. Operational definition subheading should be deleted
Response: It is now deleted, and the definitions are included under sub-heading: Study variables

Data collection procedures
3.10. The tool was prepared by reviewing by reviewing factors on willingness to pay for Hepatitis B Vaccination --Repetitive words, should be WTP, should be vaccination.
Response: The repetitive words are deleted, and acronyms such as WTP and the word ‘vaccination’ instead of ‘Vaccination’ are used.

3.11. The socio-demographic, economic, and service and knowledge related factors were addressed -- Move to Study Variables subheading and explain how they were assessed. Not addressed.
Response: Thank you for the critical comment. We described how explanatory variables were assessed.

3.12. The WTP tool was prepared by using the contingent valuation method (CVM) -- Move to Study Variables subheading and explain how they were assessed. Not addressed.
Response: This is now moved to study variables, and we described how CVM was assessed.

3.13. For data collection, five nurses supervised by two supervisors were assigned with the principal investigator critical follow up -- How? How they were recruited? Invitation or approached directly? Face to face interview or they filled the questionnaire assisted by nurses?
Response: The data collectors were approached by the principal investigator and took the training if they agreed to participate in the data collection process. Then, in the final data collection, the study participants assisted by the data collectors filled in the questionnaire.

Data processing and analysis
3.14. presented using adjusted odds ratios and 95% confidence interval -- Give the abbreviations
Response: The abbreviation for adjusted odds ratio and confidence interval are now given.

3.15. association between outcome and explanatory variables -- Please be consistent using the term, previously authors used between dependent and independent variables were
Response: …association between outcome and explanatory variables is now corrected as association between WTP for HepB vaccination and associated variables.

4. Result
Socio-demographic characteristics of study participants
4.1. Line 8/9: By explaining how respondents were recruited, readers able to understand about this rate
Response: Thank you for the comment. We described how we achieved 100% response rate.

4.2. Line 15/16: Please give the US in bracket
Response: Equivalent USD value indicated in bracket.

Health professionals’ WTP for hepatitis B virus (HBV) vaccination
4.3. Line 21/22: Sixty two point four percent of the study -- Please revise for example there were ..
Response: It is now revised as per the comment.

4.4. Line 21/22: This is not clear. Willing to pay at what state? Free? Or what price? Authors confused between acceptance and WTP. I recommend authors to revise their manuscript.
Response: Thank you for the comments. We revised the manuscript as per the comment.

4.5. Line 28/29: health professionals were unavailability of HBV vaccine (47.8%) from health institutions, -- What does it mean?
No vaccine available or no free vaccine available? If there is no vaccine available, is it appropriate to ask if respondents willing to pay?
Response: It is now revised. We believe that the perception of health professionals about HBV vaccine availability /unavailability may influence their WTP. We believe that if the health professionals are willing to pay, the government will avail the vaccine.

Factors associated with WTP for HBV vaccination
4.6. Page 10, Line 9/10: The study also revealed that factors such as occupation, getting medical advice, -- Delete also.
Response: The word ‘also’ is now deleted.

Response: It is revised as ‘medical advice about HBV’.

5. Discussion
5.1. Page 10, Line 17/18: What if the limitation in this study, authors didn’t not measure the real WTP in this study which is the highest price where respondents willing to pay. The discussion is too long. Authors should focus on variables that were statistically significant only and most important findings that associated with future prevention strategy.
Response: Thank you for the critical comment. We revised the discussion section and we focused on the significant variables. We included the limitation of the study.

5.2. Too long. See my previous study comment.
Response: We tried to delete unnecessary information, and focused on the most important points.

5.3. Page 10, Line 20: Hepatitis B virus (HBV) infection --HBV only
Response: Corrected

5.4. Page 10, Line 25: Willingness to pay for vaccination is a --WTP only
Response: Corrected

5.5. Page 10, Line 27/28: In this multi centered, cross-sectional study -- Is it called multi centered?
Response: Thank you for the comment. It was not a multi-centered study. It was a cross-sectional study. The information is now revised as ‘in this study’.

5.6. Page 11, Line 6-13: The main reasons for not willing to pay for HBV vaccination were unavailability of HBV vaccine (47.8%) from health institutions, considering not being at risk of HBV infection (10.1%), lack of awareness about the availability of HBV vaccine (16.4%), peer pressure (8.8%), lack of time (3.8%), --Repetitive with Results.
Response: It is now deleted from the discussion section as it has been described in the result section.

5.7. Page 12, Line 17-22: In this study, of 264 participants who were willing to pay for HBV vaccination, physicians were 71 (26.9%), nurses 122 (46.2%), midwives 31 (11.7%), laboratory 10 (3.8%) and others 30 (11.4%) respectively. -- Should be moved to Results Section
Response: This information is now moved to the result section.

Cristina Masella (Reviewer 2)

1. Are the methods appropriate and well described?
Methods seems to be are appropriate but the choices done should be better described (see for instance Rajamoorthy Y, Radam A, Taib NM, Rahim KA, Munusamy S, Wagner AL, et al. (2019) Willingness to pay for hepatitis B vaccination in Selangor, Malaysia: A cross-sectional household survey. PLoS ONE 14(4): e0215125)
Response: Thank you very much for the comments. We revised the methods section, especially the data analysis as per the comment.

2. Are the conclusions drawn adequately supported by the data shown?
Results are clear, but discussion might be improved. The economic impact of health professionals HBV infection is not taken into account. But it is relevant in order to better draw conclusions and policy recommendations. Many study focus on population WTP for HBV (Sardar et al. 2018, Rayamoorthy 2019, Nguyen 2019). Perhaps some comparison among factors affecting WTP found for health professionals and those described in other studies might be useful.
Response: Thank you for the critical comment. We revised the discussion section; we included the evidence from Sardar, et al as the study indicated that income had statistically significant association with WTP for HBV. We also included other studies as per the comment.

3. Please check for repetition throughout the paper.
Response: We checked for repetition and delete the repletion. Some repetitions in the discussion sections are now deleted.