

## 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

<b>TITLE (PROVISIONAL)</b>	Knowledge, attitudes and practice concerning healthcare-associated infections among healthcare workers in Wuhan, China: a cross-sectional study
<b>AUTHORS</b>	Wu, Wenwen; Wang, Wenru; Yuan, Yufeng; Lin, Likai; Tan, Yibin; Yang, Jinru; Dai, Li; Wang, Ying

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Matteo Riccò Azienda USL di Reggio Emilia - IRCCS Reggio Emilia, RE, Italy
<b>REVIEW RETURNED</b>	01-Aug-2020

<b>GENERAL COMMENTS</b>	<p>Estimated Editors, Estimated Authors, firstly thank you for the opportunity to read and review this very interesting paper on KAP of HCWs from Wuhan, China, whose settings shortly precede the ongoing planetary crisis on SARS-CoV-2 that had its initial epicenter in Wuhan. As such disorder has found (at least in Europe) a major critical point in healthcare-associated transmission, such data have become not only interesting by themselves, but also for the potential consequences on the interpretation of the initial stage of the Pandemic.</p> <p>More precisely, this is one of the very few issues that should be fixed before a full publication on BMJ Open: while it is obviously is not mandatory discussing COVID-19 in every single research paper, as such study involved professionals that, in the very next weeks had to cope with a disease having a very high risk of healthcare-associated spreading across both patients and HCWs, I warmly suggest the Authors to even marginally discuss such topic in the final sections of the paper.</p> <p>Some further suggestions:</p> <p>1) Methods are appropriated (including the description of the sample size collection) but the description of the multivariate analysis is relatively unclear when compared with the reported results. In facts, Authors have reported 4 distinctive multivariate regression analysis models (knowledge, attitudes, practices, and a summary model), and it should more clearly reported. More precisely, the single scores (knowledge, attitudes, practices, and the summary one) are rather unclear (even navigating across the supplementary tables). Therefore, I suggest to report the single values across the results section (e.g. "In summary, with a potential range of ... knowledge score was ... (actual range of...)... and so on), amending Table 1 with 4 final rows including the raw values for the three scores + the summary for KAP.</p> <p>2) Regarding the "results" section, I suggest the Authors to reformulate the sentences introducing the results of the</p>
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	<p>Multivariate analysis. For example, the present version starts as follows: "Multiple linear regression analysis showed that gender, age group, type of employment and clinical work experience explained the knowledge scores variance in 21.4% (adjusted R2 = 0.214)", and such sentence is substantially repeated for all the following models. What about starting as follows: "Results of the assessed models are reported in Table 2 to 5. More precisely, the multivariate analysis model assuming knowledge as the outcome variable ..." and so on?</p> <p>3) some very minor issues:</p> <p>a) in univariate analysis, some of the factors are associated with p values that range between 0.01 and 0.05, while other factors scored p values &lt; 0.001: because of the ongoing "p value crisis" (that is somehow as significant as the COVID-19 crisis for certain researchers) I would suggest to reformulate the correspondent sentences avoiding the term "significance", at least used encompassing all the analyses. For example: the mean scores for ... were higher among the following group of respondents ..." then list all groups with a p ranging between 0.01 and 0.05 (and reporting "(all factors p &lt; 0.05)". Then: "A difference with a p &lt; 0.001 was found for the following groups..."</p> <p>b) in the initial section of the text (page 10, row 26-27) you use the term "escort". As in some Western Countries such term may be confused with some very not-medical professionals, I suggest you to use a synonym.</p>
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<b>REVIEWER</b>	M Gualano University of Torino, Italy
<b>REVIEW RETURNED</b>	06-Aug-2020

<b>GENERAL COMMENTS</b>	The study is well written and a fair methodology was applied. The only concern for me is about the Discussion section: Authors should make some international comparisons and enlarge the limitations paragraph.
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<b>REVIEWER</b>	Silvio Tafuri Aldo Moro University of Bari, Italy
<b>REVIEW RETURNED</b>	07-Aug-2020

<b>GENERAL COMMENTS</b>	<p>Dear Editor, thank you for the opportunity of reviewing this manuscript. I think that the paper is acceptable for publication, pending some revisions:</p> <p>-Abstracts, results. Please add some data from descriptive analysis</p> <p>-Introduction</p> <p>1) Page 6, line 1. delete "or nosocomial infection"</p> <p>2) Page 6, 2nd paragraph: please, re-write the first sentence. there is a confusion between patient and HCW</p> <p>3) Page 7. The example of hand hygiene is consistent with the study purpose, but other example are needed (e.g. the correct use of masks)</p> <p>Methods</p> <p>1) The administrative organization of Wuhan district must be described (population, number of hospital etc)</p> <p>2) please, insert the adherence rate</p> <p>3) Was the questionnaire anonymous?</p> <p>Data analysis</p>
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	<p>1) In the multiple regression analysis, authors have to indicate the outcomes and the determinants. Measures of association must be also described</p> <p>Results</p> <p>Data from table 1 could be presented in the text.</p> <p>Data from Table A1/A4 must be presented in the text. it is not useful to present the same data as text and tables.</p> <p>-Discussion</p> <p>1)Please, avoid the repetition of data yet presented in results. Can you explain you results, in the light of other studies?</p> <p>References</p> <p>1) Check ref 21 for consistency</p>
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### VERSION 1 – AUTHOR RESPONSE

#### Response to Reviewer 1 Comments

Dear Matteo,

Thank you very much for your constructive and valuable comments for our paper. We have revised the manuscript and tried to address your comments carefully. The revised sections are marked in red in the paper. Below is our detailed response to your comments.

#### General comments

While it is obviously is not mandatory discussing COVID-19 in every single research paper, as such study involved professionals that, in the very next weeks had to cope with a disease having a very high risk of healthcare-associated spreading across both patients and HCWs, I warmly suggest the Authors to even marginally discuss such topic in the final sections of the paper.

Response: Thank you very much for your suggestion. We agree with the reviewer that the COVID-19 not only poses a great challenge to HCWs in Wuhan, but also the HCWs all over the world. The HCWs are suffered from unprecedented dilemma. Under the current pandemic situation, the knowledge, attitude and practice (KAP) of HCWs on healthcare-associated infection prevention and control should be improved. As suggested, we had added relevant contents about KAP of COVID-19 infection among HCWs in the discussion section on page 18, line 6-8 and page 19, line 4-8 and line 18-27.

#### Detailed suggestion:

1. Methods are appropriated (including the description of the sample size collection) but the description of the multivariate analysis is relatively unclear when compared with the reported results. In facts, Authors have reported 4 distinctive multivariate regression analysis models (knowledge, attitudes, practices, and a summary model), and it should more clearly reported. More precisely, the single scores (knowledge, attitudes, practices, and the summary one) are rather unclear (even navigating across the supplementary tables). Therefore, I suggest to report the single values across the results section (e.g. "In summary, with a potential range of ... knowledge score was ... (actual range of...) ... and so on), amending Table 1 with 4 final rows including the raw values for the three scores + the summary for KAP.

Response : We agree with the reviewer's comment. We have amended the method section (page 7, line 26-30), and single values of knowledge score, attitude score, practice score and the KAP total score have been added in the first paragraph of result section (page 8, line 19) and in the 4 final rows of the Table 1 (page 11).

2. Regarding the "results" section, I suggest the Authors to reformulate the sentences introducing the results of the Multivariate analysis. For example, the present version starts as follows: "Multiple linear regression analysis showed that gender, age group, type of employment and clinical work experience explained the knowledge scores variance in 21.4% (adjusted R<sup>2</sup> = 0.214)", and such sentence is

substantially repeated for all the following models. What about starting as follows: "Results of the assessed models are reported in Table 2 to 5. More precisely, the multivariate analysis model assuming knowledge as the outcome variable ..." and so on?

Response : Thanks for the good advice. We have amended this accordingly on page 11, line 4-13 and page 12, line 1-19.

3. some very minor issues:

a) in univariate analysis, some of the factors are associated with p values that range between 0.01 and 0.05, while other factors scored p values  $< 0.001$ : because of the ongoing "p value crisis" (that is somehow as significant as the COVID-19 crisis for certain researchers) I would suggest to reformulate the correspondent sentences avoiding the term "significance", at least used encompassing all the analyses. For example: the mean scores for ... were higher among the following group of respondents ..." then list all groups with a p ranging between 0.01 and 0.05 (and reporting "(all factors  $p < 0.05$ )". Then: "A difference with a  $p < 0.001$  was found for the following groups..."

Response : Thanks for reviewer's suggestion. We have amended this accordingly on page 8, line 25-30 and page 9, line 1-30.

b) in the initial section of the text (page 10, row 26-27) you use the term "escort". As in some Western Countries such term may be confused with some very not-medical professionals, I suggest you to use a synonym.

Response : Thank for reviewer's comment. The "escort" means workers who help nurses or family members of patients taking care of patients. In order to express the meaning more accurately, we have substituted "nurse's assistant" for "escort" on page 5 line 29.

#### Response to Reviewer 2 Comments

Dear M Gualano,

Thank you very much for your encouragement and affirmation about our manuscript. We have strengthened the discussion section according to your suggestions which have marked in red in the manuscript on page 18-19.

#### Response to Reviewer 3 Comments

Dear Tafuri,

We appreciate your response and overall positive initial feedback and we have made modifications to improve the manuscript according to your constructive suggestions.

1.-Abstracts, results. Please add some data from descriptive analysis

Responses: We agree with the reviewer and this has been addressed accordingly. Please see details in abstract section on page 2, line 12-21 and in result section on page 8, 9-19.

2.-Introduction

1) Page 6, line 1. delete "or nosocomial infection"

Response: Thanks for the comments. We have amended this accordingly on page 4, line 1.

2) Page 6, 2nd paragraph: please, re-write the first sentence. there is a confusion between patient and HCW

Response: Thanks for the good advice. This has been addressed accordingly on page 4, line 19-21.

3) Page 7. The example of hand hygiene is consistent with the study purpose, but other example is needed (e.g. the correct use of masks)

Response: Thanks for reviewer's suggestion. We have added the example of correct use of masks especially during the pandemic of COVID-19 on page 4, line 24-26.

### 3.Methods

1) The administrative organization of Wuhan district must be described (population, number of hospitals etc)

Response: Thanks for the comments. As of 2019, there were 49 tertiary hospitals in Wuhan, with 8.41 hospital beds per 1000 people. We have added the medical resource introduction of Wuhan city on page 5, line 20-21.

2) please, insert the adherence rate

Response: We thank reviewer's suggestion. In total, 500 HCWs were invited to participate in the study. A total of 468 HCWs completed the online questionnaire (response rate = 93.6%). Kindly refer the revised text for the details on page 8, line 5-6.

3) Was the questionnaire anonymous?

Response: Thanks for the comments. Yes, the survey was anonymous. With the support of the department of human resources of the two study hospitals, the researchers randomly selected the potential participants from the list of job numbers of HCWs, and then sent the online link of questionnaires to the potential participants. The HCWs who received questionnaires voluntarily completed and returned them online. For details, please see page 5, line 21-27 and page 7, line 14-15.

### 4.Data analysis

1) In the multiple regression analysis, authors have to indicate the outcomes and the determinants. Measures of association must be also described

Response: We agree with the reviewer and as suggested, we have revised this on page 7, line 26-30.

### 5.Results

1) Data from table 1 could be presented in the text.

Response: Thank you for pointing out this. We have presented in more details of table 1 in the main text accordingly on page 8, Line 9-19.

2) Data from Table A1/A4 must be presented in the text. it is not useful to present the same data as text and tables.

Response: Thanks for the suggestion. We have amended the results of univariate analysis on page 8 (line 23-29) and page 9 (line 1-30) based on the data of Table A1-A4.

### 6.Discussion

1)Please, avoid the repetition of data yet presented in results. Can you explain you results, in the light of other studies?

Response: Thank for the reviewer to highlight this issue. We have revised the discussion section and compared with other related research results on page 18, line 19-21, line 29-33, page 19, line 1-8 and page19, line 18-27.

2) Check ref 21 for consistency

Response: Thank you for your advice. We have checked carefully. We have added two new references and rank of this reference now becomes 23.

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Matteo Riccò Azienda USL di Reggio Emilia
<b>REVIEW RETURNED</b>	05-Oct-2020
<b>GENERAL COMMENTS</b>	Authors have extensively addressed the concerns that the reviewers have previously addressed.

## VERSION 2 – AUTHOR RESPONSE

Response to Reviewer #1

Please state any competing interests or state 'None declared': none declared.

Response: We have stated the competing interests on page 21, line 30.