

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

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| TITLE (PROVISIONAL) | Drivers and mediators of healthcare workers' anxiety in one of the most affected hospitals by COVID-19: a qualitative analysis. |
| AUTHORS | Fang, Mengling; Xia, Bo; Tian, Tian; Hao, Yan; Wu, Zhenghao |

VERSION 1 – REVIEW

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| REVIEWER | Seockhoon Chung Asan Medical Center, Korea |
| REVIEW RETURNED | 09-Oct-2020 |

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| GENERAL COMMENTS | It is a very important report about the mental health and anxiety of healthcare workers during the COVID-19 pandemic. It is not easy to perform this type of qualitative study, but the authors did it successfully. This manuscript is valuable to be accepted. |
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| REVIEWER | Dr. Jeffrey Pradeep Raj Seth GS Medical College & KEM Hospital, Mumbai, India |
| REVIEW RETURNED | 12-Nov-2020 |

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| GENERAL COMMENTS | <p>Thank you for the opportunity to review this manuscript. The following are the major concerns that I have</p> <ol style="list-style-type: none">1. There are a lot of grammatical and sentence formation errors right from the abstract.2. The work is carried out in May - July 2020 when the WHO had already declared the COVID outbreak as Pandemic. The authors have continuously used the word epidemic and it is inappropriate. This is more important in this paper because the psychology of a person will be more affected for one to have go through a pandemic when compared to an epidemic. Personally I would feel more anxious on the scale of disaster - epidemic versus pandemic3. Abstract - objective - sentence formation is wrong and hence the meaning is unclear4. Design - This is a qualitative in-depth interview. This I feel would be the right terminology5. Methods - design & patients - the term survey is an inappropriate term as it defines a specific study design of quantitative methods.6. A written informed consent could still have been obtained using electronic forms7. In which language was the interview done? If not done in English, how was the translation done?8. Page 7 - line 46 - The term tortured by COVID-19 looks very dramatic. |
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| | <p>9. Page 9, lines 6 - 17 - The entire text is in present tense - Was it a statement of a participant? If not the tense used should be past tense as it is a report</p> <p>10. Similar issues through out the results section</p> <p>11. Discussion has a lot of repetition from introduction and results.</p> <p>12. The authors have mentioned that this is the first qual study. However there have been multiple Qual studies already published in this field. For example: Am J Infect Control. 2020 Jun; 48(6): 592–598. Although the 'title' may be unique, the content is all similar.</p> <p>13. Conclusion - It has been stated as new insights. I beg to disagree. as mentioned earlier, these are repetitions of the other published papers</p> |
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| REVIEWER | Dr Mohammad Behnammoghadam Yasuj University of Medical sciences, Yasuj, Iran Isfahan University of Medical sciences, Isfahan, Iran |
| REVIEW RETURNED | 09-Dec-2020 |

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| GENERAL COMMENTS | The rigor of this study was not discussed |
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| REVIEWER | Fawaz, Mirna Beirut Arab University |
| REVIEW RETURNED | 22-Dec-2020 |

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| GENERAL COMMENTS | <p>Dear author,</p> <p>I enjoyed reading your paper however I have a few concerns.</p> <p>1- The paper needs extensive grammatical editing</p> <p>2- the methodology lacks a trustworthiness section which is crucial for any qualitative exploration</p> <p>3- what is the epistemological approach applied in this paper? Please elaborate on it.</p> <p>4- Who did the interviews? All the authors? One researcher? How did it go? What is the expertise of the authors please elaborate.</p> <p>Other than that all looks great.</p> |
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VERSION 1 – AUTHOR RESPONSE

Replies to Reviewer 1

Comment 1: It is a very important report about the mental health and anxiety of healthcare workers during the COVID-19 pandemic. It is not easy to perform this type of qualitative study, but the authors did it successfully. This manuscript is valuable to be accepted.

Response :

Thanks very much for your encouragement! We strive to reveal the drivers and mediators of healthcare workers' anxiety during COVID-19 pandemics, and we hope that our research can make the public pay attention to the psychological problems of medical staff and provide possible ways to relieve their anxiety.

3.Replies to Reviewer 2

Comment 1: There are a lot of grammatical and sentence formation errors right from the abstract.

Response :

We feel sorry for the inconvenience brought to the reviewer. We checked the grammar and sentence formation throughout the article with professional English editors' assistance.

Comment 2: The work is carried out in May - July 2020 when the WHO had already declared the COVID outbreak as pandemic. The authors have continuously used the word epidemic and it is inappropriate. This is more important in this paper because the psychology of a person will be more affected for one to have gone through a pandemic when compared to an epidemic. Personally I would feel more anxious on the scale of disaster - epidemic versus pandemic

Response :

We gratefully appreciate your valuable suggestion. The World Health Organization (WHO) on March 11 declared COVID-19 a pandemic, pointing to coronavirus illness all over the world and the sustained risk of further global spread. In contrast, an epidemic refers to an uptick in the spread of a disease within a specific community. In our study, interviewees came into contact with COVID-19 patients in December 2019, when COVID-19 broke out in our study setting (Central Hospital of Wuhan, China) for the first time in the world. Therefore, interviewees experienced the whole process from the local epidemic to the global pandemic. Thanks to your kind reminder of the difference between the usage of epidemic and pandemic, we revised the manuscript in related texts.

Comment 3: Abstract - objective - sentence formation is wrong and hence the meaning is unclear

Response :

Thank you so much for your careful check! We have changed the original text to "To report driving and mediating factors of healthcare workers' anxiety during the COVID-19 pandemic." (page 2, line 7-9).

Comment 4: Design - This is a qualitative in-depth interview. This I feel would be the right terminology

Response :

We gratefully appreciate for your valuable suggestion. We have changed "Semistructured interview study" to "Qualitative in-depth interview study" (page 2, line 10).

Comment 5: Methods - design & patients - the term survey is an inappropriate term as it defines a specific study design of quantitative methods.

Response :

We agree with the reviewer about our misuse of the term "survey". A survey is a method that selects a relatively large sample of people from a predetermined population, followed by the collection of data from those individuals, and maybe exploratory, descriptive, or explanatory. In healthcare epidemiology, surveys and qualitative research are considered to be two totally different methods, but they can complement each other [1]. Therefore, we replaced "survey" with "research" (page 5, line 21,37).

[1]. Safdar, N., et al., Research Methods in Healthcare Epidemiology: Survey and Qualitative Research. *Infection Control & Hospital Epidemiology*, 2016. 37(11): p. 1272-1277.

Comment 6: A written informed consent could still have been obtained using electronic forms

Response :

We are very appreciative of your comments and added the specific process of obtaining informed consent. "To fully inform participants of all relevant information and risks of this research, formal informed consent was provided to all participants before the interview. At the beginning of the interview, all participants acknowledged that they had read this informed consent and fully understood this research." (page 6, line 39-42)

Comment 7: In which language was the interview done? If not done in English, how was the translation done?

Response :

Thank you for your rigorous consideration. We tried to answer this question in the original manuscript and wrote: "all excerpts from interviews in this paper were translated from Chinese by investigators,

and native English speakers cooperatively to convey the interviewees' semantics completely." (page 6, line 41-44). To address your concerns, we have revised the text and hope that it is now clearer. We have modified the original text to "all participants are native Chinese speakers, so all interviews are conducted in Chinese. To cite the interviewees' words in this paper and completely convey their semantics, investigators and native English speakers cooperatively translated these excerpts to English." (page 6, line 41-44)

Comment 8: Page 7 - line 46 - The term tortured by COVID-19 looks very dramatic.

Response :

We have replaced "their colleague tortured by COVID-19" with "their colleague hurt by COVID-19" (page 7, line 46).

Comment 9: Page 9, lines 6 - 17 - The entire text is in present tense - Was it a statement of a participant? If not the tense used should be past tense as it is a report

Comment 10: Similar issues throughout the results section

Response :

We must apologize for the ambiguity caused by the wrong use of tense. We checked carefully for the tense of the full text based on your suggestion and used the present tense for participants' statements and the past tense for our report.

Comment 11: Discussion has a lot of repetition from introduction and results.

Response :

We feel sorry for the repetition between the discussion and other texts and thus completely revised the discussion. (page 13-15)

Comment 12: The authors have mentioned that this is the first qual study. However, there have been multiple Qual studies already published in this field. For example: Am J Infect Control. 2020 Jun; 48(6): 592–598. Although the 'title' may be unique, the content is all similar.

Response :

Thank you for your rigorous consideration. We searched again all studies that focused on healthcare workers' experience in the COVID-19 pandemic, and found several published qualitative studies [1-5]. We felt sorry for our wrong statement about "first qual study" before and revised it in the article.

Compared with these studies, our research has the following highlights:

1. Our research delves into the mental health of high-risk healthcare workers in the COVID-19 pandemic. Most of our interviewees have high-risk psychological factors, including nurses, women, frontline workers, and those working in Wuhan, China [6]. 18/53 (34%) participants were confirmed to have been infected by COVID-19. In addition, they worked in one of the hospitals where COVID-19 first broke out, and bore a heavy psychological burden, including grieving tremendously for their partners' death.

2. We provided a comprehensive conceptual model to describe dynamic change and relevant factors of healthcare workers' anxiety during different stages of pandemics. Among all similar qualitative studies, Eftekhari Ardebili provided the three-level model of mental health considerations for healthcare providers, although the indispensable role of social support was ignored [2].

3. We firstly identified financial status as the primary driver of healthcare workers' anxiety in the final stages of the COVID-19 pandemic. After the epidemic was under control in Wuhan, participants complained of unsatisfied incomes because the government canceled allowance and patients unwilling to visit the hospital for fear of COVID-19. In addition, the long-term COVID-19 control policy prevented patients from another province to our hospital for treatment. Some interviewees also felt that their efforts and sacrifice had not been reasonably compensated. Therefore, our research reminded the government and society that both psychological support and financial rewards matter for healthcare workers.

- [1]Liu, Q., et al., The experiences of healthcare providers during the COVID-19 crisis in China: a qualitative study. *The Lancet Global Health*, 2020. 8(6): p. e790-e798.
- [2]Eftekhari Ardebili, M., et al., Healthcare providers experience of working during the COVID-19 pandemic: A qualitative study. *American Journal of Infection Control*, 2020.
- [3]Bennett, P., et al., COVID-19 confessions: a qualitative exploration of healthcare workers experiences of working with COVID-19. *BMJ Open*, 2020. 10(12): p. e043949-e043949.
- [4]Sun, N., et al., A qualitative study on the psychological experience of caregivers of COVID-19 patients. *American Journal of Infection Control*, 2020. 48(6): p. 592-598.
- [5]Calendar, N., et al., Exploring nurses' experiences of psychological distress during care of patients with COVID-19: a qualitative study. *BMC Psychiatry*, 2020. 20(1).
- [6]Lai, J., et al., Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Network Open*, 2020. 3(3): p. e203976.

Comment 13: Conclusion - It has been stated as new insights. I beg to disagree. as mentioned earlier, these are repetitions of the other published papers

Response :

We totally understand the reviewer's concern. As our reply to comment 12, there are three major highlights in our study. In order to emphasize these insights, we revised the conclusion to the following text:

"Our research reports a comprehensive conceptual model to describe the cause and regulation of anxiety among healthcare workers at different stages of the pandemic and raises problems about the protective measure for psychology and physiology. Although the government and society provide materials and spirit support as much as possible, most healthcare workers still felt neglected and anxious about infection risk and income levels. Psychological intervention and personal protection for healthcare workers need to be immediately carried out, especially in the districts and hospitals affected seriously by COVID-19. Healthcare workers in the epidemic-controlled district have less infection risk but also lower-income, so they benefited more from financial compensation. " (page 14, line 35-50)

4.Replies to Reviewer 3

Comment 1: The rigor of this study was not discussed

Response :

We gratefully appreciate your valuable suggestion and supplemented the trustworthiness section in the method to discuss the rigor of this study:

"All kinds of workers in the CHW, including doctors, nurses, administrative and support staff, were sampled for the study. By using these separate groups, we aimed to improve the trustworthiness of the data." (page 6, line 20-24)

"Trustworthiness

Trustworthiness is the standard that constitutes the rigor of qualitative research [13]. During the interviews, similar questions were put in different ways to ensure that the informant's view was correctly captured. Then, coauthors reviewed and commented on relevant interview transcripts separately and discussed their findings through continuous communications. To promote reflexivity during analysis meetings, team members discussed their insights, perceptions, and potential biases to make sure they were accounted for in data interpretation [13]. Then interpreted results were sent to participants via email for comments or corrections to ensure that participants' opinions were accurately reflected in the data and to check the consistency between the results of the researchers and the actual intentions of the participants [14]. Dependability is achieved through accurate records and in-depth descriptions of the methods used in the research. In terms of transferability, we used a detailed description method to ensure sufficient and accurate contextual information. The findings and conclusions can be transferred to other studies with similar situations. The quotes from the interviews are also provided as examples to clarify the explicated meanings and establish validity." (page 8, line 4-10)

5.Replies to Reviewer 4

Comment 1: The paper needs extensive grammatical editing

Response :

We feel sorry for the inconvenience brought to the reviewer. We checked the grammar and sentence formation throughout the article with the assistance of professional English editors.

Comment 2: the methodology lacks a trustworthiness section which is crucial for any qualitative exploration

Response :

We supplemented the following text in the method:

“All kinds of workers in the CHW, including doctors, nurses, administrative and support staff, were sampled for the study. By using these separate groups, we aimed to improve the trustworthiness of the data.” (page 6, line 20-24)

“Trustworthiness

Trustworthiness is the standard that constitutes the rigor of qualitative research [13]. During the interviews, similar questions were put in different ways to ensure that the informant’s view was correctly captured. Then, coauthors reviewed and commented on relevant interview transcripts separately and discussed their findings through continuous communications. To promote reflexivity during analysis meetings, team members discussed their insights, perceptions, and potential biases to make sure they were accounted for in data interpretation [13]. Then interpreted results were sent to participants via email for comments or corrections to ensure that participants’ opinions were accurately reflected in the data and to check the consistency between the results of the researchers and the actual intentions of the participants [14]. Dependability is achieved through accurate records and in-depth descriptions of the methods used in the research. In terms of transferability, we used a detailed description method to ensure sufficient and accurate contextual information. The findings and conclusions can be transferred to other studies with similar situations. The quotes from the interviews are also provided as examples to clarify the explicated meanings and establish validity.” (page 8, line 4-10)

[13]. Malterud, K., Qualitative research: standards, challenges, and guidelines. *The Lancet*, 2001. 358(9280): p. 483-488.

[14]. Maher, L. and G. Dertadian, Qualitative research. *Addiction*, 2018. 113(1): p. 167-172.

Comment 3: what is the epistemological approach applied in this paper? Please elaborate on it.

Response :

We must apologize for our unclear expression about the epistemological approach applied in this paper. We tried to answer this question in the original manuscript and wrote: “The data was analyzed by a team of three trained qualitative researchers based on a qualitative content analysis method [11]. This approach is designed to interpret meaning from the content of interview data and, hence, adhere to the naturalistic paradigm” (page 6, line 17).

To address your concerns, we have revised the original text to “The data was analyzed by a team of three trained qualitative researchers based on Hsieh’s conventional content analysis method [11]. Hsieh’s approach is generally used with a study design to describe a phenomenon, healthcare workers’ emotional reactions during the COVID-19 pandemic in this case. The advantage of Hsieh’s approach is gaining direct information from study participants without imposing preconceived categories or theoretical perspectives. Researchers immerse themselves in interview data content to allow new insights to emerge [11].” (page 7, line 20-25)

[11] Hsieh, H. and S.E. Shannon, Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 2016. 15(9): p. 1277-1288.

Comment 4: Who did the interviews? All the authors? One researcher? How did it go? What is the expertise of the authors please elaborate.

Response :

Thank you for your rigorous consideration. To answer your confusion, we supplemented the following text in the method: "All researchers participated in the interview. Researchers possessed experience in qualitative interviews and underwent training by tutors with psychological consultant certificates issued by the Ministry of Human Resources and Social Security of China. They also worked in the frontline during the COVID-19 pandemic and empathized with other healthcare workers. Therefore, the researcher was able to carry out interviews independently." (page 6, line 50-55)

VERSION 2 – REVIEW

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| REVIEWER | Mirna Fawaz Beirut Arab University, Lebanon |
| REVIEW RETURNED | 01-Feb-2021 |
| GENERAL COMMENTS | The paper looks great. I enjoyed reading it, dear author. All comments were addressed. |