

## RESPONSE TO THE REVIEWER COMMENTS

### Round Two Peer-review

#### Comment:

Thank you for the opportunity to re-review this interesting manuscript. The authors have addressed all of my queries and the paper has significantly improved. There are still some minor issues that should be addressed: - Minor grammar issues should be corrected. For example - "staying in the shared" in the abstract, unneeded commas (after "Besides" in the intro), and so on.

**Response:** We would like to express our gratitude to the reviewer for their insightful observation. We have corrected the grammar and carefully proofread the manuscript.

**Comment-** The authors stated in their revisions letter, the demographic and clinical characteristics were available for all HCWs in both facilities from the human resources. This should be included in the methods for the readers to understand how data was available for all HCWs.

**Response:** We thank the reviewer for the observation made. The following statement has been included in the abstract and methods.

The - Many of the findings refer to frontline HCWs, while this definition does not appear in the text. How did you decide which HCW is in the frontline? Are they only those treated COVID-19 patients? Those that treated any patients on a daily basis?

**Response:** We thank the reviewer for their insightful observation. We have included the definition of frontline HCWs in the methods.

Frontline HCWs were those who provide care for patients with COVID-19 or worked in areas with direct patient contact during the pandemic.

The authors describe the issue of vaccine hesitancy among HCWs and their perceptions toward it. In this regard I recommend the authors to use the following work which directly addresses this issue: DOI: 10.12998/wjcc.v11.i4.821 This work describes the perceptions of HCWs towards vaccine hesitancy. It can be used to show that still most HCWs are in favor of the vaccine and conceive vaccine hesitancy to be a key factor for the continuation of the pandemic.

**Response:** We thank the referee for the suggestion. The reference has been cited in the revised manuscript.

## Round One Peer-review

### Reviewer # 1

#### Comment

This is a survey study of analysis the risk factors and characteristics of transmission of SARS-CoV-2 infection among HCWs. It is a novel study with good writing.

**Response:** We thank the reviewer for the prompt peer review and kind comments.

Comment: However, there are some small parts need to be further editing. First, is there any infected HCWs who got reinfected? Couldn't tell from the data. This situation should be listed that might interfere the results.

**Response:** We thank the reviewer for the observation made. Sixteen (4.6%) healthcare workers were re-infected. However, we only recorded the first infection with SARS-CoV-2 for the analysis. The same has been mentioned in the methods and results.

Comment: Second, the data is showed by different month in figure 1. There are obviously 3 peaks of the infection number. What do we get from this data? It is deserve to make a good discussion.

**Response:** We appreciate the comments about figure 1. The data on the average number of cases per month was extracted from the website of National Emergency Crisis and Disaster Management Authority, UAE (<https://covid19.ncema.gov.ae/en>). We included the source of data in the methods. We agree with the comments of the reviewer about peaks in the figure. There is an agreement in the peaks of two trend charts. This may reflect a synchronisation in the infection rate among healthcare workers and the incidence of SARS-CoV-2 in the community. Hospital officials can utilise this information to plan for the workforce and strengthen hospital infection prevention measures to mitigate the risk among HCWs.

Comment: Thirdly, it is a little confusing to read the part of Frontline HCWs and Non-Frontline HCWs in Table 2. Are they infected or not?

**Response:** We thank the reviewer for this observation. The frontline and non-frontline HCWs in table 2, were infected HCWs. We have created a new table (table 3) in the revised manuscript to avoid confusion.

### Reviewer # 2

#### Comment

Thank you for the opportunity to review this interesting manuscript. The authors describe an observational cohort of health care workers that were infected with COVID-19 and address its associated risk factors. This is a very important topic and the paper is overall well written.

[Response: We thank the reviewer for the peer-review and comments.](#)

Comment: There are still some major issues which should be addressed. #1: Introduction – This part is comprehensive and describes well the main topic. The authors state that the study is prospective. However, I don't think this is the case as all data regarding the infection, transmission, and other contacts were retrospective and based on participants memory. The data were not collected during the events and therefore in my opinion it is not prospective.

[Response: We appreciate the comment raised by the reviewer. We agree with the reviewer that data on infection, was collected from hospitals health records. However, the information on the social contacts, accommodation, transmission among households and co-workers was collected through a prospective cross-sectional survey. We have changed the study type to retrospective in the introduction.](#)

#2: Results: This section has major issues which must be addressed. In general – if you have data only on infected HCW – you can't perform any analysis on risk factors for infection – because those who were not infected are not included in your study. - There is a major issue of recall bias. The questionnaire was administered about a year after the infections. Are all your data based solely on the questionnaires? Did all participants remember minor things such as the date their housemates or co-workers were infected in relation to them?

[Response: We thank the reviewer for the comment. The data was collected from two sources: the hospital human resource records and a cross-sectional survey. The information on accommodation, demography, frontline vs non-frontline and vaccination of all HCWs was extracted from the human resource. However, the information on households, social contacts and vaccination was collected from the infected HCWs through a cross-sectional survey. We agree with the reviewer on the potential for recall bias. However, to avoid this bias, the data collected from the cross-sectional survey was validated through the hospital records. The same has been acknowledged in the revised manuscript.](#)

Comment: Is some information missing and not reported (Table 1)? I find it hard to believe that all participants remember the entire data. - In Table 2 the infected HCW group includes only the participants which filled the questionnaire and compared with all the HCWs in general. How do you have all this information on the rest of

the HCWs which were not infected or not performed the questionnaire? If you have this information on all HCWs, why not including all the 346 HCWs that were infected in the infected group and just compare them to those who were not infected?

Response: We appreciate the concern raised by the reviewer. The information on social contacts and households was collected through a cross-sectional survey. There is a potential for recall bias because of a gap between the timing of infection and data collection. It has been acknowledged as a limitation in the discussion section of the revised manuscript. We agree with observation made by the reviewer for table 2. We re-performed the analysis between uninfected HCWs (n=1282) and infected HCWs (n=346).

Comment: Regardless of the issues above, the HCW that were infected but did complete the questionnaire must not be a part of the non-infected HCWs for comparison. This group should be extracted from all comparisons if you don't have the information on them. If you do have - include them in the infected group.

Response: We thank the reviewer for this comment. The missing data is on households of HCWs. We have modified table 2. The characteristics of uninfected and infected HCWs, available from the human resource department, were only compared in table 2

- The second part of Table 2 is wrong as well! By comparing only frontline to non-frontline infected HCW you cannot make any conclusions on general risk factors for infection - a conclusion you did in the abstract, results and discussion. For example, the fact that males had more infections in the frontline group only means that among infected HCWs, being a male was associated with being a frontline worker.

Response: We agree with the comment raised by the reviewer. Only infected HCWs were invited for the cross-sectional survey. Hence, we do not have data on uninfected frontline HCWs for their households. The abstract, results and discussion have been revised.

Comment: How did you analyze the correlation figure 1? Did you just assumed it by looking at the graph or was a statistical test performed?

Response: No statistical test was performed. We have added a median line for the trend chart. Based on the visual impression, three peaks were identified in the trend chart. The peaks coincided in the trend charts, representing an increased rate of infection among HCWs with higher incidence rate in the community.

Comment: P value should not be reported as 0.00.

Response: We thank the reviewer for the comment. This has been corrected in the revised manuscript.

Comment: Discussion: The importance of vaccine in COVID-19 should be more highlighted. In this regard I recommend the authors to use the following paper which extensively describe the impact of vaccinations on severe infections:

<https://doi.org/10.1371/journal.pone.0268050>

Response: We thank the referee for the suggestion. The reference has been cited in the revised manuscript.

The following paragraph has been added in the revised manuscript.

The vaccination of HCWs effectively reduces the risk of severe disease and the transmission of SARS-CoV-2<sup>[18]</sup>. Advanced age ( $\geq 65$  years), male sex, and co-morbidities like diabetes mellitus, chronic respiratory disease, hypertension, chronic kidney disease, and cardiovascular disease are risk factors for severe illness and mortality<sup>[19]</sup>. COVID-19 vaccination is highly effective in reducing the risk of progression of the severity of disease and ICU or hospital admission, especially in the elderly and patients with co-morbidities<sup>[20]</sup>. Vaccination among HCWs is an essential intervention to protect them from infection and severe illness requiring ICU or hospital admission. Moreover, the effectiveness of the vaccine in reducing the risk of disease reduces considerably after six months of the last dose, and a booster dose is recommended for the vulnerable population, including HCWs<sup>[18]</sup>. Vaccine hesitancy among HCWs is a major issue in successfully implementing the COVID-19 vaccination programme. Only 70.2% of participants have agreed to the efficacy of the COVID-19 vaccines. Other studies also found more vaccination hesitation among previously infected people<sup>[21]</sup>. The hospital leadership and infection preventionist should address the issue of vaccine hesitancy strategically and through collaboration.