

## Perceived Stress levels among Anaesthesia and Intensive Care staff during the third wave of the COVID-19 pandemic: A report from Afghanistan

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### Abstract

Hospitals are highly challenging and stressful workplaces. The COVID-19 pandemic adds even more stress to intensive care unit (ICU) and anaesthesia staff who are at the frontline dealing with COVID-19 patients, and are highly likely to experience psychological disturbances and mental health problems.

In this study, we examined the demographic characteristics associated with level of stress among clinical anaesthesia and ICU department staff via a questionnaire and scoring scale. 311 people were invited to participate in the survey, and a total of 175 completed it during June 19, 2021 to July 26, 2021 from thirteen Kabul public and private hospitals. The questionnaire included information about age, gender and 10 questions of Perceived Stress Scale during the third wave of COVID-19 pandemic.

The results showed that 96.6% of respondents reported moderate to high stress levels. Chi-square analysis found that age groups of equal or less than 40 years old, anaesthesia staff, participants who had occasional contact with COVID-19 and female gender were associated with high stress levels.

Anaesthesia and ICU staff experience high levels of self-perceived stress during the COVID-19 pandemic. Consideration may be given to stress reduction techniques.

**Key words:** Emotional Stress, Covid-19, Intensive Care Units, Anaesthesia Department, Afghanistan

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### INTRODUCTION

The first cases of COVID-19 were reported in the Wuhan city of Hubei Province in central China on December 29, 2019 as pneumonia of unknown cause. Subsequently, the World Health Organization (WHO) declared COVID-19 as a global pandemic on March 12, 2020<sup>1</sup>. The first case of COVID-19 in Afghanistan was reported in the western province of Herat in a 35-year-old Afghan retailer who had returned from Qom city in Iran on Feb 9, 2020.<sup>2</sup> COVID-19 was responsible for 69,130 confirmed cases and 2,881 deaths in the country as of May 28, 2021. These estimates, however, do not appear to correspond to the real rate of disease transmission.<sup>3</sup>

Health-care workers involved in the COVID-19 pandemic are exposed to high levels of stressful events and exhibit significant unfavorable mental health outcomes, such as stress-related symptoms and sadness, anxiety, and sleeplessness symptoms.<sup>4</sup> When people sense a gap between the demands of a situation

and the resources of their biological, psychological, or social systems to deal with it successfully, they experience stress.<sup>5</sup> At modest amounts, stress can be beneficial to the body. When stress becomes excessive, the body has difficulties adapting or coping with it, both physically and psychologically, the harmful effects of stress arise. In these cases, stress has a role in the development of a variety of health and psychological problems.<sup>6</sup> Hospitals are highly challenging and stressful workplaces even in the best of times. Medical staff face numerous stressors such as medical emergency situations, patients' deaths, time pressure, steep hierarchies, and team conflicts.<sup>7,8</sup>

Anaesthesia and critical care physicians are at the frontline dealing with COVID-19 patients, and are highly likely to experience psychological disturbances and mental health problems.<sup>9,10</sup> Reported factors that contribute to these mental and psychological effects include increased workload in ICU, lack of Personal

Protection Equipment, lack of a vaccine or treatment, social stigma, and concern of spreading of the disease, especially to their families. In this study, we examined the level of stress and demographic characteristics associated with level of stress among the anaesthesia and ICU departments in Kabul hospitals using a questionnaire and a specific scale.

In Afghanistan, the majority of anaesthetics are delivered by practitioners who have graduated from a two-year Nurse Anaesthetist program or a four-year Bachelor of Science in Anaesthesia technology program. The program is supervised by faculties and staff of the Anaesthesiology department at Kabul University of Medical Sciences, some of whom have completed a five-year residency program in Anaesthesiology.<sup>11</sup> Unfortunately, we do not have a formal training program in critical care and so the ICU is managed by a multidisciplinary team composed of many different health professionals without formal critical care training.

## METHODS

This is a cross sectional study modelled after a published research study by Hassan et al.,<sup>12</sup> at Cairo University in Egypt in which a questionnaire was used to assess levels of stress in staff. Approval was given by the scientific research and ethics center of the Allied Health Kabul University of Medical Sciences committee. All aspects of this study followed the ethical standards of the relevant national and institutional committees. We obtained a list of anaesthesia and intensive care unit staff who work in clinical settings from the directorate of the hospitals.

The questionnaire was distributed to all the anaesthesia and ICU staff in thirteen Kabul public and private hospitals via social media and official email. Participation was voluntary, the survey was anonymous, and researchers were blinded to the participants. 311 staff were invited to participate in the study, and 184 filled in the questionnaire during the period of June 19, 2021, to July 26, 2021 by using the Survey link. Nine respondents were eliminated from consideration because of incomplete information.

The questionnaire included information about age, gender, speciality, contact with Covid-19 and 10 questions of Perceived Stress Scale (PSS-10) during the third wave of COVID-19 pandemic. The PSS-10 questionnaire contains 10 questions which assesses the perceived stress of an individual. The questions are answered from 0 to 4, where 0 indicates never and 4 indicates always. The PSS scores are obtained by reversing responses (4=0, 3=1, 2=2, 1=3, 0=4) to the question and then adding all scale points. For PSS-10, a score of 13 is considered moderate, and a score of 20 or higher shows a high level of stress requiring lifestyle modification and learning stress reduction techniques.<sup>12</sup> See Appendix A for the survey in Dari and English.

Initially, the data was entered into an excel datasheet and then exported to IBM SPSS version 24 for Windows for statistical analysis. Bi-variable analysis was used to determine factors which are associated with stress level. A p-value of <0.05 was set as significance level at 95% confidence interval.

## RESULTS

There were a total of 175 anaesthesia and intensive care participants, with 113 (64.6%) males, 55 (31.4%) females and 7 (4%) participants who preferred not to say their gender. 41.1% of the study population were in the 20-29 age group. Among the study population, 61.7% were anaesthesia physicians, technicians and nurses, and the remaining 38.3% were ICU physicians and nurses. More than half of the study population (53.7%) had continuous contact with COVID-19. (Table 1)

**Table 1:** Demographic characteristics of the subjects (n=175)

| Characteristics              |                        | n (%)      |
|------------------------------|------------------------|------------|
| <b>Gender</b>                | Male                   | 113 (64.6) |
|                              | Female                 | 55 (31.4)  |
|                              | Not mentioned          | 7 (4)      |
| <b>Age group</b>             | 20-29                  | 72 (41.1)  |
|                              | 30-39                  | 56 (32)    |
|                              | 40-49                  | 29 (16.5)  |
|                              | 50-59                  | 12 (6.9)   |
|                              | =>60                   | 6 (3.4)    |
| <b>Speciality</b>            | Anaesthesia physician  | 37 (21.14) |
|                              | Anaesthesia technician | 60 (34.29) |
|                              | Anaesthesia nurse      | 11 (6.28)  |
|                              | ICU physician          | 59 (33.29) |
|                              | ICU nurse              | 8 (4.57)   |
| <b>Contact with Covid-19</b> | Continuous contact     | 94 (53.7)  |
|                              | Sometimes              | 42 (24)    |
|                              | Don't know             | 22 (12.6)  |
|                              | No contact             | 17 (9.7)   |

3.4 % of study participants reported low stress levels, 92.6% reported moderate stress levels, and 4% reported high stress levels.

Table 2 shows significant demographic characteristics associated with level of stress. Female participants reported high stress levels more than male participants with an odds ratio of 5.9 and a 95% confidence interval (1.1-31.4), as demonstrated in Table 2. Subjects 40 years old or younger reported high stress levels more than subjects 40 years old or greater, with an odds ratio of 2.1 and its correspondent 95% confidence interval (0.5-9.8) in this study, but this did not reach statistical significance (p-value = 0.388).

ICU staff reported lower stress levels compared to anaesthesia staff with an odds ratio of 3.9 and its correspondent 95% confidence interval (0.5 -33).

Participants who had occasional contact with COVID-19 patients reported high stress levels, more than those who had continuous contact with COVID-19 patients, with odds ratio of 3 and its correspondent 95% confidence interval (0.6-16).

## DISCUSSION

The COVID-19 pandemic is unprecedented in contemporary history. Previous studies have shown that epidemics and the spread of the disease are associated with severe psychological, individual and social effects that eventually become more widespread than outbreaks.<sup>13</sup> Due to the worldwide high prevalence of COVID-19 and the high rate of hospitalizations, health care workers are more likely than others to be exposed to the disease as they are in the first line of defence.<sup>14</sup>

The level of moderate stress in our study population was 92.6 %, which was higher than what has been reported by studies in the middle east including AI Ateeq et al.,<sup>15</sup> Almater et al.,<sup>16</sup> Ahmed Arafa et al.,<sup>17</sup> and Barnaz A et al.,<sup>18</sup> where moderate stress levels of 36.1%, 68.2%, 36.6% and 67.3% were reported. This might be due to differences in the training environment of health workers, including more attentive training to deal with an epidemic such as COVID-19,

and the increased availability of personal protective equipment, which could all lead to lower stress levels<sup>19</sup>. Lai et al., indicated that health care workers experienced high levels of depressive symptoms, anxiety and stress.<sup>20</sup> However the level of high stress in our study population was 4%, which was similar to the study conducted by Almater et al.,<sup>16</sup> in Saudi Arabia with a reported level of 3.7% and was lower than what were by AI Ateeq et al.,<sup>15</sup> Ahmed Arafa et al.,<sup>17</sup> and Barnaz A et al.,<sup>18</sup> who reported high stress levels of 32.3%, 19.3% and 17.3% respectively.

Chi-square analysis found that female participants reported higher stress levels than the male participants in our study. Natasha Shaukat et al.,<sup>19</sup> Lai et al.,<sup>20</sup> and Deldar Morad Abdullah<sup>21</sup> reported similarly. It has been proposed that long working hours, childcare, household responsibilities, and exposure to moral dilemmas can increase anxiety and stress in female participants.<sup>22</sup>

Subjects 40 years or less in age had higher risk of high stress levels compared to those aged 40 years or older, which were consistent in the study accompanied by Barnaz A et al.,<sup>18</sup> in Iraqi Kurdistan and Tahereh Sarbozi Hosseinabadi et al.,<sup>23</sup> where they reported high stress levels in the age group of 31- 40 years old. Also in a study conducted by Ahmed Arafa et al.,<sup>17</sup> high stress levels were found in age group of subjects equal or less than 30 years old. In contrast, a study conducted by Mohammad Rahmanian et al.,<sup>24</sup> in Jahrom, Iran, reported the highest anxiety in the age group of 41-50 years and over 50 years in health workers who had contact with COVID-19 patients.

In our study population, ICU staff had lower rates of high stress levels compared to anaesthesia staff. In contrast, Tahere Sarbozi Hossein abadi et al.,<sup>23</sup> demonstrated that levels of stress in internal medicine doctors were higher than ICU and infectious disease doctors. Additionally, the study conducted by Nhan Phuc Thanh Nguyen et al.,<sup>25</sup> revealed that 50.3% of doctors, 46.3% of nurses and 50% of laboratory staff had mild mental stress. Ahmed Arafa et al.,<sup>17</sup> also reported 55.9% of mild mental stress existed among

**Table 2:** Results of chi-square analysis for demographic characteristics associated with level of stress

| Characteristics              |                      | Level of stress   |               | ORC **<br>(95 % CI) | p-value |
|------------------------------|----------------------|-------------------|---------------|---------------------|---------|
|                              |                      | Moderate<br>n (%) | High<br>n (%) |                     |         |
| <b>Gender</b>                | Female               | 50 (90.90)        | 5 (9.09)      | 5.9<br>(1.1-31.4)   | 0.032*  |
|                              | Male                 | 118 (98.33)       | 2 (1.66)      |                     |         |
| <b>Age Category</b>          | =>40                 | 124 (96.87)       | 4 (3.12)      | 2.1<br>(0.5-9.8)    | 0.388*  |
|                              | <40                  | 44 (93.61)        | 3 (6.38)      |                     |         |
| <b>Speciality</b>            | Anaesthesia staff    | 102 (94.44)       | 6 (5.55)      | 3.9<br>(0.5-33)     | 0.253*  |
|                              | ICU staff            | 66 (98.5)         | 1 (1.49)      |                     |         |
| <b>Contact with COVID-19</b> | Occasionally contact | 76 (93.82)        | 5 (6.17)      | 3.0<br>(0.6-16)     | 0.252*  |
|                              | Continuous contact   | 92 (97.87)        | 2 (2.12)      |                     |         |

\* Fisher's exact test

\*\*Crude odds ratio

health workers. Anaesthesia doctors might be at higher risk for mental health problems due to conventional airway management of suspected or confirmed COVID-19 patients.<sup>26</sup>

Moreover, our study participants who had been in contact with COVID-19 occasionally had higher stress levels than those who had continuous contact with COVID-19, unlike Phuc Thanh Nguyen et al.,<sup>25</sup> findings in Vietnam. They reported high stress levels in workers with continuous contact with COVID-19 patients. This could be due to fear of transmitting the disease to their relatives, social stigma, lack of access to personal protective equipment and the lack of clear protocol to cope with COVID-19 cases.

## CONCLUSION

Moderate to high stress levels were reported by 96.6% of clinical ICU anaesthesia workers in Kabul, Afghanistan. Associated risk factors for high stress levels included age less than 40 years old, working in the anaesthesia department, participants who had only occasional contact with Covid-19, and female gender. Attention may be given to stress reduction ways.

## LIMITATIONS

We acknowledge that our study had several limitations. As data were collected via an online survey, we do not know whether the anaesthesia and intensive care staff who participated in the survey were representative of all anaesthesia and intensive care staff in Afghanistan. Response bias may also cause the data to not accurately reflect the entire ICU and anaesthesia staff. Recall bias and social desirability may have affected the quality of data provided by some anaesthesia and intensive care staff.

## RECOMMENDATIONS

The authors would like to suggest the following:

1. Further prospective trials with stress reduction interventions should be conducted to evaluate for practices that may improve stress levels.
2. Necessary attention and investment should be given to standardized training, access to equipment and clear protocols in the clinical setting.

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## APPENDIX A

### Dari version of Questionnaire

#### فورم جمع آوری معلومات :

سوالات در رابطه معلومات دیموگرافیک اشتراک کننده گان

آیا درین سروی به صورت داوطلبانه اشتراک میکنید؟

• بلی

• نخیر

جنسیت اشتراک کننده

• مرد

• زن

• بهتر است ذکر نکنم

سن اشتراک کننده

• 20-29

• 30-39

• 40-49

• 50-59

•  $\geq 60$

رشته تخصصی اشتراک کننده

• داکتر ICU

• نرس ICU

• داکترانستیزی

• نرس انستیزی

• تکنیشن انستیزی

• کارمند صحی سایر بخش ها

تماس اشتراک کننده با مریضان کووید - ۱۹

• به صورت دوامدار با مریضان کووید ۱۹ در تماس میباشم

- بعضاً با مریضان کووید ۱۹ در تماس می باشم
  - با مریضان کووید ۱۹ در تماس نمی باشم
  - در مورد مصاب بودن مراجعه کننده گان ام به مرض کووید ۱۹ نمی دانم
- شما به مریضی کووید ۱۹ مصاب شده اید؟
- اعراض کووید ۱۹ داشتم و همچنان تست لابراتواری ام مثبت بود
  - اعراض کووید ۱۹ داشتم اما تست را انجام ندادم
  - هیچ اعراض کووید ۱۹ را تجربه نکردم اما اعضای خانواده ام مصاب شده بودند
  - در مورد مصاب بودنم به مرض کووید ۱۹ نه فهمیدم

### سوالات در رابطه به نگرانی و اضطراب (PSS-10)

۱. در ماه گذشته، بخاطر حوادث غیر متوقعه، مصابیت و پیامد های آن چند مرتبه احساس افسردگی نمودید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثراً اوقات

۲. در ماه گذشته چند مرتبه احساس کرده اید که به امورات مهم تنظیم شده خویش رسیدگی نتوانسته اید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۳. در ماه گذشته چند مرتبه نگرانی و یا اضطراب را تجربه نموده اید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۴. در ماه گذشته، در رسیدگی به مشکلات خویش به چه اندازه اعتماد به نفس داشتید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۵. در ماه گذشته، امورات روزمره تان به چه اندازه مطابق میل شما انجام شده اند؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۶. در ماه گذشته، تمام امورات معمول که باید انجام می دادید، چند مرتبه نتوانستید که انجام دهید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثراً اوقات

۷. در ماه گذشته، چند مرتبه توانستید که خشم خویش را کنترل نمائید؟



- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۸. در ماه گذشته، چند مرتبه احساس کردید که تمام امورات خویش را به وجه احسن تنظیم نموده اید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۹. در ماه گذشته، از سبب عدم رسیدگی به خود و فعالیت های خویش چند مرتبه خشمگین شده اید؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات

۱۰. در ماه گذشته، چند مرتبه احساس کرده اید که مشکلات زندگی تان به شکل تصاعدی زیاد شده رفته که از توان رسیدگی تان خارج شده اند؟

- هیچگاه
- بسیار کم
- بعضاً
- چندین مرتبه
- اکثر اوقات



## English version of Questionnaire

### Data collection sheet

#### Questions regarding to demographic characteristics

1. Do you want to participate in this survey voluntarily?

- Yes
- No

2. Your gender:

- Male
- Female
- Prefer not to say

3. Your age group:

- 20-29
- 30-39
- 40-49
- 50-59
- $\geq 60$

4. Your Specialty:

- Anaesthesia Physician
- Anaesthesia technician
- Anaesthesia nurse
- ICU Physician
- ICU nurse
- Others

5. Exposure to COVID-19 patients:

- Not dealing with symptomatic or confirmed cases
- Occasionally dealing with symptomatic or confirmed cases
- Regularly dealing with symptomatic or confirmed cases

6. Have you affected to COVID-19 disease?

- I had COVID-19 symptoms and my lab test was positive
- I had COVID-19 symptoms but did not take the lab test
- I did not experience any Covid 19 symptoms but my family members were affected
- I did not understand that I was infected by Covid disease

## Questions regarding to mental stress (PSS-10)

1. In the last month, how often have you been upset because of something that happened unexpectedly?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

3. In the last month, how often have you felt nervous and stressed?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

5. In the last month, how often have you felt that things were going your way?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

- Never

- Almost never
- Sometimes
- Fairly often
- Very often

7. In the last month, how often have you been able to control irritations in your life?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

8. In the last month, how often have you felt that you were on top of things?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

9. In the last month, how often have you been angered because of things that happened that were outside of your control?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often