

# Stress and burnout among trainee anaesthesiologists at different stages of FCPS training

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## Abstract

**Objective:** To assess the prevalence and severity of stress level and burnout among trainee anaesthesiologists at two different stages of training.

**Method:** The prospective, cross-sectional study was conducted at the Anaesthesia Department of the Aga Khan University Hospital, Karachi, from December 2020 to June 2021, and comprised individuals of either gender receiving training for the Fellowship of the College of Physicians and Surgeons Pakistan. They were divided into two groups based on their length of training period. Group J included trainees before the IMM exam but only with 6-18 months of training, and Group S included trainees after the IMM exam with 30-42 months of training. The Perceived Stress Scale and Maslach Burnout Inventory were used to measure stress and burnout. Data was analysed using SPSS 25.

**Results:** Of the 99 subjects with mean age  $27.81 \pm 2.50$  years, 58(58.6%) were female and 41(41.4%) were male. There were 58(58.6%) subjects in Group J compared to 41(41.4%) in Group S. Of the total, 50(50.5%) subjects were associated with private-sector hospitals, while 49(49.5%) were working in the public sector. Overall stress was moderate  $19.74 \pm 6.66$  and burnout was in the low range  $17.02 \pm 9.36$ . In Group J, 12(20.7%) subjects had high stress compared to 5(12.2%) in Group S. There was a significantly higher level of stress and burnout in those working in the private sector than those in the public sector ( $p=0.001$ ).

**Conclusion:** Stress and burnout were found to be highly-prevalent among anaesthesia trainees, particularly in the earlier stages of training.

**Keywords:** Stress, Burnout, Anaesthesia trainee, FCPS. (JPMA 76: 1649; 2026) DOI: <https://doi.org/10.47391/JPMA.30393>

## Introduction

Burnout among medical personnel is on the rise worldwide, especially in high-stress fields, like anaesthesiology. Prolonged excessive stress is the consequence of physician burnout. Stress is characterised as an unpleasant "emotional experience accompanied by biochemical, physiological and behavioural changes.<sup>1</sup> Burnout is characterised as emotional exhaustion (EE), depersonalisation (DP), and a loss of sense of personal accomplishment (PA).<sup>2</sup>

Long workdays, crucial clinical decisions and irregular shift patterns are among the particular stressors that anaesthesia residents frequently deal with.<sup>3</sup> These demands raise the risk of stress and burnout, especially when combined with academic pressure and sleep deprivation,<sup>4</sup> which can be a key factor in serious health problems, such as cardiovascular disease, and may have an adverse effect on patient care. Among medical professionals, high levels of stress and burnout are widely recognised, and the reported incidence among

anaesthesiologists is 50-96%.<sup>5</sup>

Because anaesthesiology is a demanding field with high work requirements, practitioners are at a higher risk of burnout.<sup>6</sup> Compared to experienced anaesthesiologists, trainees are more vulnerable to stress because of inexperience and lack of knowledge.<sup>7,8</sup> Negative effects of stress include employees' reluctance to work and discontentment with their jobs.<sup>9</sup>

The College of Physicians and Surgeons Pakistan (CPSP), the only regulatory college in Pakistan providing postgraduate medical education, offers a specialised training programme in various specialities, called the Fellowship of College of Physicians and Surgeons Pakistan (FCPS). The four-year anaesthesia training programme includes demanding clinical work, exams and research requirements. There is scarce local data on how stress and burnout change over the course of training, with previous studies indicating moderate to high burnout levels among Pakistani anaesthesiologists.<sup>10,11</sup>

The current study was planned to compare the prevalence of perceived stress and burnout among anaesthesia trainees at two different stages of FCPS training.

## Subjects and Methods

This prospective cross-sectional study was conducted at

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the Anaesthesia Department of the Aga Khan University Hospital (AKUH), Karachi, from December 2020 to June 2021 and comprised FCPS anaesthesiology trainees working in tertiary care settings. After approval from the institutional ethics review committee, the sample size calculation was based on the previously reported prevalence of occupational stress among anaesthesiologists, which was 50%.<sup>2</sup> The total number of FCPS anaesthesia residents is 130 (i.e., population size,  $n=130$ ). A total of 98 anaesthesia residents will be included to estimate the expected level of stress and burnout among trainee anaesthesiologists (assumed prevalence=50%) with a 5% margin of error and a 95% confidence interval. The sample size was calculated using the OpenEpi sample size calculator. The formula used was: " $n = \frac{[DEFF * Np(1-p)]}{[(d^2/Z^{2(1-\alpha/2)}(N-1) + p*(1-p)]}$ ".<sup>12</sup> The sample was raised using non-probability consecutive sampling technique.

All the trainees, regardless of age or gender, who were registered for fellowship in anaesthesiology were included. The only ones excluded were those who declined to participate or did not show up for the Intermediate Module (IMM) exam when they were eligible to (after 24 months of training) or took long enough to appear for exam (making two unsuccessful attempts). After taking informed consent from the subjects, they were divided into two groups based on their length of training period. Group J included trainees before the IMM exam but only with 6-18 months of training, and Group S included trainees after the IMM exam with 30-42 months of training.

The subjects were given the option of completing the questionnaire either online or manually. The questionnaire had three sections. Part A included demographics, part B included the Perceived Stress Scale (PSS)<sup>13</sup> and part C incorporated the Maslach Burnout Inventory (MBI).<sup>14</sup>

PSS has 10 questions that are expressed negatively and 4 that are positive. The four positively expressed items (Nos 4, 5, 7, 8) are reversibly answered (0=4, 1=3, 2=2, 3=1 and 4=0) to generate PSS scores, which are then aggregated across all scale items. Greater scores on the PSS indicate more perceived stress. Individual scores on the PSS can range 0-40. Scores between 0-13 indicate low stress, 14-26 indicate moderate stress, and 27-40 indicate high perceived stress.<sup>13</sup>

The MBI is the most used instrument to assess burnout. The MBI has three components. Section A looks at burnout or emotional exhaustion, and includes 7 questions that are scored on a 6-point scale, with 0=never, 1=a few times per year, 2=once a month, 3=a few times per month, 4=once a week, and 5=every day. The overall score determines the

burnout category, with score up to 17 = low burnout, 18-29=moderate burnout, 30 or above=high burnout. Section B assesses depersonalisation whose hallmark is a lack of empathy. It also includes 7 questions that are scored on a 6-point scale. A total score of 5 or less indicates low burnout, 6-11 indicates moderate burnout, and a score of 12 and greater means high burnout. Section C deals with the sense of personal achievement. It has eight questions that are scored on a 6-point scale. A total score of 33 or less means high burnout, 34-39 shows moderate burnout, and 40 or greater indicates low burnout. A high score in the first two sections and a low score in the last section may indicate burnout.<sup>14</sup>

Data was analysed using SPSS 19. The Shapiro-Wilk test was used to assess the normality of quantitative variables. Based on normality assumption, mean±standard deviation was calculated for age and PSS. Frequencies and percentages were calculated for qualitative variables, such as marital status, gender, number of children, year of residency, working plan, stress in professional life, and stress level and burnout among the trainee anaesthesiologists. The mean PSS score was compared using an independent sample *t*-test between junior and senior trainees. Cross-tabulation analysis was performed to determine the statistical difference with respect to age, gender, marital status, number of children, working plan, number of calls per months, and administrative problems. Chi-Square or Fisher's Exact test was used for comparing qualitative variables, and an independent sample *t*-test was used to compare the level of stress, burnout and DP between junior and senior residents.  $P \leq 0.05$  was considered significant.

## Results

Of the 99 subjects with mean age  $27.81 \pm 2.50$  years, 58(58.6%) were in Group J and 41(41.4%) in Group S. There were 58(58.6%) females and 41(41.4%) males, and with

**Table-1:** Demographic characteristics (n=99).

| Variable                   | Junior<br>(n=58) | Senior<br>(n=41) | Total<br>(n=99) | p-value |
|----------------------------|------------------|------------------|-----------------|---------|
| <b>Mean Age (years)</b>    | 26.98±1.94       | 28.98±2.75       | 27.81±2.50      | 0.001   |
| <b>Gender</b>              |                  |                  |                 | 0.300   |
| Male                       | 27 (46.6)        | 14 (34.1)        | 41 (41.4)       |         |
| Female                     | 31 (53.4)        | 27 (65.9)        | 58 (58.6)       |         |
| <b>Marital Status</b>      |                  |                  |                 | 0.388   |
| Single                     | 41 (70.7)        | 25 (61.0)        | 66 (66.7)       |         |
| Married                    | 17 (29.3)        | 16 (39.0)        | 33 (33.3)       |         |
| <b>Sector</b>              |                  |                  |                 | 0.002   |
| Private                    | 37 (63.8)        | 13 (31.7)        | 50 (50.5)       |         |
| Public                     | 21 (36.2)        | 28 (68.3)        | 49 (49.5)       |         |
| <b>Number of Children</b>  |                  |                  |                 | 0.012   |
| Zero (excluding Unmarried) | 14 (24.13)       | 7 (17.07)        | 21 (21.21)      |         |
| 1-2                        | 3 (5.2)          | 9 (22)           | 12 (12.1)       |         |

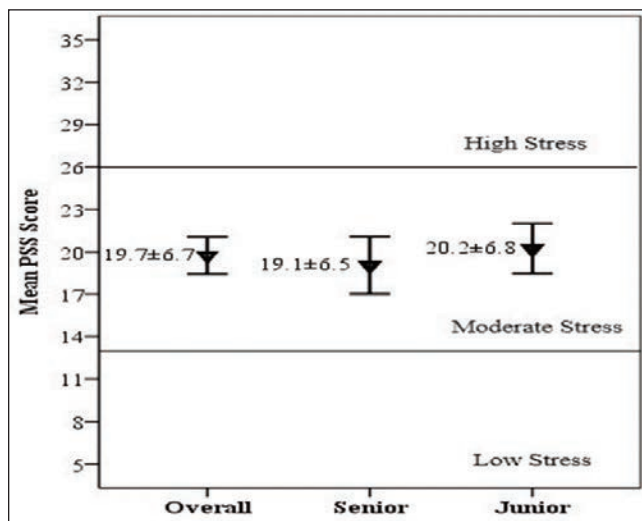


Figure-1: Comparison of mean Perceived Stress Scale (PSS) score.

Table-2: Cross-tabulation analysis.

|                                  | Junior<br>(n=58) | Senior<br>(n=41) | Total<br>(n=99) | p-value |
|----------------------------------|------------------|------------------|-----------------|---------|
| <b>Mean Burnout</b>              | 17.8±9.75        | 16.0±8.80        | 17.0±9.36       | 0.334   |
| Low -                            | 29 (50.0%)       | 27 (65.9%)       | 56 (56.6%)      | 0.192   |
| Moderate                         | 21 (36.2%)       | 12 (29.3%)       | 33 (33.3%)      |         |
| High                             | 8 (13.8%)        | 2 (4.9%)         | 10 (10.1%)      |         |
| <b>Mean Depersonalisation</b>    | 9.57±6.75        | 10.6±7.35        | 9.98±6.98       | 0.496   |
| Low                              | 17 (29.3%)       | 11 (26.8%)       | 28 (28.3%)      | 0.887   |
| Moderate                         | 24 (41.4%)       | 19 (46.3%)       | 43 (43.4%)      |         |
| High                             | 17 (29.3%)       | 11 (26.8%)       | 28 (28.3%)      |         |
| <b>Mean Personal Achievement</b> | 26.5±6.55        | 26.8±7.48        | 26.6±6.92       | 0.842   |
| Low                              | 51 (87.9%)       | 33 (80.5%)       | 84 (84.8%)      | 0.318   |
| Moderate                         | 6 (10.3%)        | 8 (19.5%)        | 14 (14.1%)      |         |
| High                             | 1 (1.7%)         | 0 (0%)           | 1 (1.01%)       |         |

respect to demographic characteristics, the groups were comparable except for age (Table 1).

Overall stress was moderate  $19.74 \pm 6.66$  (Figure). In Group J, 12(20.7%) subjects had high stress compared to 5(12.2%) in Group S. Overall burnout was in the low range  $17.02 \pm 9.36$ .

Of the total, 50(50.5%) subjects were associated with private-sector hospitals, while 49(49.5%) were working in the public sector. There was a significantly higher level of stress and burnout in those working in the private sector than those in the public sector ( $p=0.001$ ) (Table 2).

## Discussion

The current study found high prevalence of stress among FCPS trainees, with significant greater level observed in the early years of training. These results are in line with research from around the world which shows that junior residents experience higher level of stress because of their lack of

clinical experience, workload adaptations and academic pressure.<sup>2,6,8,10,15</sup>

Certain degrees of stress may be deemed useful for training and enhanced performance, but chronic stress may predispose young doctors to Burnout syndrome, which is damaging for the residents themselves and for the wider patient population they serve. Hence, there is a need for intervention modified to the unique challenges faced by the trainees.<sup>16,17</sup>

Chinese anaesthesiologists have significant levels of burnout and low work satisfaction.<sup>18</sup> The current data suggests that the degree of stress and burnout varies depending on the stage of training, with some phases requiring greater psychological impact than others. Academic pressure, growing clinical responsibilities, and evolving expectations from trainees could all be contributing factors.

Similar to the current study, earlier research has shown that workload, absence of control, and inadequate support network increase the risk of burnout.<sup>13,19</sup> This demands institutional policies to prioritise the mental health and promote an environment of transparency regarding distress.<sup>14,20</sup>

Rest periods that are protected, and work schedules that are limited are efficient methods of preventing burnout. The current study supports approaches that emphasise workload management, mentorship, mental health services and stress management training,<sup>21-23</sup> particularly in the early years of residency. Additionally, institutions must guarantee protected academic time, fair working hours, and debriefing opportunities following significant incidents.

Burnout has an impact beyond personal health as it may jeopardise patient safety and care. Burnout among trainee anaesthesiologists may impair their ability to make decisions, and decrease their empathy, which may have an impact on clinical results.<sup>24</sup>

Both the general quality of patient care and the wellbeing of trainees may be enhanced by implementing wellness initiatives and structural changes during residency training. Customised interventions, like stress management classes, counselling services and programmatic adjustments, should be implemented.<sup>7,9</sup>

Effective burnout prevention involves a series of interventional strategies. Three categories can be used to prevent burnout: primary prevention (avoidance of triggers), secondary prevention (early detection and intervention), and tertiary prevention (rehabilitation and strategies for dealing with stress).<sup>25</sup>

The current study has some limitations as the measuring scales for stress and burnout were generalised, and the PSS only refers to the preceding one month of stress or acute stress. Also, reliance on self-reported data may have introduced response bias. Finally, the study evaluated some of the risk variables contributing to stress and burnout, like gender, employment sector and marital status. Since these factors have implications in one category only, further research is recommended.

## Conclusion

Stress and burnout were found to be highly prevalent among anaesthesia trainees, particularly in the earlier stages of training, emphasising the need for early detection and assistance.

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### Author Contribution:

**MR:** Concept, design, data acquisition, drafting, revision, final approval and agreement to be accountable for all aspects of the work.

**HU:** Concept, design, revision, final approval and agreement to be accountable for all aspects of the work.