



Original Article

## Burnout and Ways to Reduce It among Postgraduate Residents of Neurosurgery

<sup>1</sup>Muhammad Usman, <sup>2</sup>Shahzad Hussain Waqar

<sup>1</sup>Department of Neurosurgery, PAF Hospital, Fazaia Medical College, <sup>2</sup>Department of Surgery, Pakistan Institute of Medical Sciences, Islamabad – Pakistan

### ABSTRACT

**Objective:** The objective of the study was to know the rate of burnout and to explore the potential means to reduce burnout among neurosurgery residents.

**Material and Methods:** This mixed-method explanatory sequential study was conducted at the Neurosurgery department of Lady Reading Hospital, Peshawar from July to September 2021. In the first phase of the study, burnout was assessed in postgraduate residents of Neurosurgery and its relationship with different demographic factors (quantitative). In the second phase focus group discussion with the residents were conducted to explore the ways to reduce burnout in residents (qualitative).

**Results:** 23 residents participated in the study. Burnout was found in 17 (73.9%) residents. The relationship between different demographic factors with burnout was not statistically significant. The results of the FGDs showed that the reasons behind burnout are; more workload, decrease interaction with the seniors, extra burden on trainees, conflicts with patient's attendants, increased entries in the HMS system, wrong referrals from the periphery, decrease security of doctors in high-risk areas and lack of ownership by the seniors. The postgraduate residents suggested different ways to reduce burnout; including proper security of residents and all the staff, appreciation of the performance, peripheries should be developed and functional, SOPs for every part of the training should be advised, and proper training of the ancillary staff.

**Conclusion:** The majority of the neurosurgery residents were burnout and there is no statistically significant difference between different demographic factors related to burnout. This study also provided preliminary ways to reduce burnout among neurosurgery residents.

**Keywords:** Burnout, Neurosurgery, Residency, Demographic Factors.

**Corresponding Author:** Muhammad Usman  
Department of Neurosurgery,  
PAF Hospital, Fazaia Medical College, Islamabad – Pakistan  
Email: drusman387@yahoo.com

Date of Online Publishing: 31-03-2023

Date of Print: 31-03-2023

DOI: 10.36552/pjns.v27i1.848

Date of Submission: 02-12-2022

Date of Revision: 25-03-2023

Date of Acceptance: 28-03-2023

### INTRODUCTION

Burnout is defined as, a "physical and mental

syndrome which entails physical exhaustion, fatigue and the emotions of hopelessness and desperation with a negative attitude towards work, life, and other people".<sup>1</sup>

Throughout the career of physicians, they are disposed to a certain amount of burnout, from medical school to consultant level.<sup>2</sup> The prevalence of burnout showed a persistent rise among US physicians from 2011 to 2014.

The prevalence is found to be even higher among fellows and residents.<sup>3</sup>

Higher levels of burnout have a lot of negative consequences in way that it is associated with low quality of life, reduced work efficiency, and premature retirement.<sup>4, 5</sup> Burnout in residents is high and this fact has been shown by different researchers.<sup>2,3,6</sup>

The prevalence of burnout has increased from 45% in 2011 to 54% in 2014 among US physicians. The prevalence is found to be higher among fellows and residents. In all surgical specialties as a whole, prevalence is found to be 40%, while in neurosurgery it ranges from 27% to 56%, which is somewhat high as compared to others.<sup>3</sup>

Burnout in residents is high and this fact has been shown by two researchers that burnout in neurosurgery residents was found out to be 36%<sup>3</sup> and 67%.<sup>6</sup> While Shakir et al in a most recent publication documented burnout in neurosurgery residents as high as 69%.<sup>2</sup>

Burnout is strongly related to decreased productivity and the inability to perform tasks efficiently, which ultimately results in poor patient care.<sup>7</sup>

Furthermore, it is evident from the literature that burnout in postgraduate residents and physicians is associated with an increased rate of medical negligence.<sup>3</sup>

Neurosurgery postgraduate residents are prone to a lot of stress and unforeseen challenges, which consequently leads to unhealthy lifestyles, and increase the level of dissatisfaction and burnout.<sup>8</sup> Postgraduate

training in neurosurgery is a demanding and stressful challenge emotionally, physically, and intellectually.<sup>9</sup>

There is a very convincing role of different demographic factors in influencing burnout. From the view of researcher's perspective, factors that are related to a high rate of burnout are a high level of responsibility, loss of autonomy, and increased working hours and on-calls. Unfortunately, all these factors hold, considering the residents.<sup>6</sup> While other studies thought that, the factors which are related to burnout are younger age, number of nights on call per week, increased working hours, and less time for family.<sup>8</sup> These findings are more devastating and seems that an unseen epidemic is on the way.

Extensive research has been done on burnout, in many specialties, like general surgery, internal medicine, otolaryngology, oncology, and orthopedics. But little is known about neurosurgery in the literature on this aspect.<sup>7</sup> The research in the field of burnout among neurosurgical residents is quite rare globally and no research has been done in Pakistan yet on this aspect. Thus, this study will aim to find out burnout, through the validated tool and to do in-depth exploration through a focus group discussion to explore the ways for reducing burnout among neurosurgery residents of a tertiary care hospital in Pakistan.

Awareness, identification, and management of burnout are ignored in most of the traditional programs of medical education. The available literature in our part of the world is in the infancy stages regarding awareness of burnout and in Pakistan, no research has been done on burnout among neurosurgery residents. Furthermore, as far as up to our knowledge, no study in Pakistan has ever highlighted to explore reasons/ways to reduce burnout in neurosurgical residents, to date. Therefore, this study will fill this gap by doing qualitative analysis in the form of in-depth exploration by focus group discussion of the neurosurgery residents of a tertiary care hospital

in Pakistan, to explore the ways for the reduction of burnout.

The main aim of this study is to raise awareness about this serious issue and to explore the potential means to reduce burnout among neurosurgery residents, as well as to assess the association between different demographic factors, like gender, age, postgraduate year, in clinical rotation to other departments, marital status, and children, with burnout. The results will generate not only the local statistics but also the preliminary data for attenuating burnout as well as some primary means for counteracting these problems.

This study will give some insight into how to control the burnout level and ultimately minimize its negative consequences, by introducing reforms. Finally, when there will be a low level of burnout among the neurosurgery residents, this will not only improve their performance but ultimately patient care will be improved.

## MATERIAL AND METHODS

### Study Design

This action research, mixed method explanatory sequential study was conducted at the Neurosurgery department of Lady Reading Hospital, Peshawar from July to September 2021.

### Inclusion Criteria

After taking permission from the Institutional ethical committee, all willing neurosurgery FCPS residents were included in the study using a convenience non-probability sampling technique for the quantitative part and a purposeful sampling technique with maximal variation for the qualitative part of the research. The participants included in the study were third, fourth, and final-year FCPS neurosurgery residents.

### Exclusion Criteria

Neurosurgery postgraduate residents are not

willing to participate in the study.

### Data Collection Procedure

The purpose of the research was explained to all the residents and written informed consent was taken, with the option to withdraw from the study anytime during the study. In the first phase of the study, burnout was assessed in postgraduate residents of Neurosurgery and its relationship with different demographic factors (quantitative); two questionnaires were used. Questionnaire A data related to demographics (gender, age, socio-economic position, marital status, having kids, day scholars or hostelites, in parent ward or rotation), while Questionnaire B included validated MBI-HSS; which is Maslach Burnout Inventory for Human Services Survey,<sup>10</sup> to assess the burnout rate among postgraduate residents of Neurosurgery. It included three dimensions:

- i. a) "Emotional exhaustion (EE),"
- ii. b) "Depersonalization (DP),"
- iii. c) "Personal accomplishment (PA),".

"The MBI-HSS comprises 22 questions, which are graded by the respondents on a Likert scale of 7-points which ranges from 0 to 6, where 0 = never, 1 = few times a year, 2 = once a month, 3 = a few times a month, 4 = once a week, 5 = a few times a week, 6 = every day.

Data from Questionnaires A & B was used to know the burnout rate in residents and the effect of different demographic factors on burnout.

In the second phase focus group discussion with the residents were conducted to explore the ways to reduce burnout in residents (qualitative). The results of the quantitative data were shared with the residents and that was followed by a focus group discussion (FGD) for exploring the ways to reduce burnout in postgraduate residents of Neurosurgery. Two FGDs were done of 1-hour duration each, comprised of 5 residents in each group. The whole focus group discussion was voice recorded via mobile and later transcribed verbatim.

## Data Analysis Procedure

The data (Questionnaire A & B) was entered and analyzed in SPSS software version 26. The burnout was analyzed as; a Validated MBI HSS scale was used. "The MBI-HSS comprised 22 questions, which are graded by the participants on a Likert scale of 7 points. "The EE comprises nine elements with a maximum of 54 scores; DP comprises five items with a maximum of 30 scores; and PA comprises eight items with a maximum of 48 scores. The scores relate to three stages of burnout: high, moderate, and low. In the EE dimension, the high burnout level is  $\geq 27$ , moderate between 19 and 26, and low below 19. In DP, the high burnout level is  $\geq 10$ , moderate between 6 and 9, and low below 6. In PA, high burnout is  $\leq 33$ , moderate between 34 and 39, and low  $\geq 40$ . High scores in EE and/or DP or low scores in PA are considered to indicate Burnout."<sup>10</sup> Mean  $\pm$  SD of the scores for items in the questionnaire provided by the participants were calculated. Descriptive statistics were used like frequencies and percentages regarding categorical variables. The burnout was stratified among different demographic factors (age, gender, socio-economic status, marital status, having children, day scholars or hostelites, inward or rotation), to see the relationship between different factors with the severity of burnout. Correlation between categorical variables was tested by using the Chi-square test. The statistical significance was set at a P-value  $< 0.05$ .

In analyzing focus group data, proper attention was paid to the interaction between the participants, as well as the difference of opinions between the groups. Analysis was done through codes, sub-codes and themes, and sub-themes.

## RESULTS

### Age & Gender

There was a total of 23 residents who participated in the study, of those only 1 (4.3%) was female.

The mean age of the participants was  $29.78 \pm 1.704$  years, while the age range was 27 – 34 years. The majority of the residents were above 30 years, i.e., 14 (60.9%). Most of the residents 10 (43.5%) were in their 4<sup>th</sup> year of residency, followed by the final year, 7 (30.4%), and then the 3<sup>rd</sup> year, 6 (26.1%).

### Demographics

The majority 16 (69.6%) of the residents belong to good socioeconomic status, followed by 7 (30.4%) residents of average socio-economic status. The marital status of the residents was as, single 17 (74%), married without children 3 (13%), and married with children 3 (13%). Fourteen (60.9%) residents were day scholars while 9 (39.1%) resided in the hostel adjacent to the hospital. Of 23 residents, 22 (95.7%) were in the neurosurgery ward, while only 1 (4.3%) was on rotation to another ward.

### Burnout

Burnout was found in 17 (73.9%) residents and detailed burnout in each dimension is shown in Table 1. The relationship between different demographic factors with burnout is shown in Table 2, and the difference is statistically not significant ( $p = < 0.05$ ).

### Focused Group Discussions

The results of the FGDs showed that the majority of the residents admitted that they are burnout and the reasons behind burnout are; more workload, prolonged duty hours, especially duties in the neuro-trauma which are critical, no incentives and rewards, decrease interaction with the seniors, decrease or absent basic facilities on the duty floor, extra burden on trainees by taking care of evening IBPP (institutionalized based private practice) patients, conflicts with patient's attendants, which are in abundant, increase number of patients per ward, increase patients

and ultimately increase entries in the HMS system, uneducated patients and attendants, wrong referrals from other trauma specialties and periphery, ancillary staff not performing their duties up to the mark, decrease the security of doctors in high-risk areas, lack of ownership by the seniors, and no proper accommodation for the trainee doctors. The postgraduate residents suggested different ways to reduce burnout; proper security of residents and all the staff, appreciation of performance in the form of doctor of the month, rewards, etc., recreational facilities like extracurricular activities at least once a month, duty hours as well as the job description of the residents should be defined and if the residents are performing duties beyond that time so then appraisal/rewards should be given, academics should be incorporated more frequently, peripheries should be developed and functional so that unnecessary referrals should be avoided, SOPs for every part of the training should be advised and proper training of the ancillary staff should be the norm.

## DISCUSSION

In the current study, burnout was found in more than two third of the residents (73.9%), which is slightly higher than the reported burnout in neurosurgery residents worldwide, which is up to 69%.<sup>2,6</sup> This higher rate of burnout is not only alarming but certainly needs optimum measures because it is known from the research that a high rate of burnout is associated with poorer patient

outcomes.<sup>7</sup>

In our study, there is no statistically significant difference in burnout rate concerning gender. Although there is only 1 female in our study, who did not suffer from burnout on the overall MBI-HSS scale. In a national study by Ujjan et al,<sup>11</sup> as compared to males, the female was having a high rate of burnout and the burnout was more on the depersonalization scale. However, in the study females consisted of only 9.4% of the whole sample. Compatible with our study, there are two studies; Baumgarten et al<sup>12</sup> and Yu et al<sup>13</sup>, which

**Table 1:** Burnout in Residents.

Burnout	EE Dimension n (%)	PA Dimension n (%)	DP Dimension n (%)	Burnout n (%)
Yes	17 (73.9)	7 (30.4)	17 (73.9)	17 (73.9)
No	6 (26.1)	16 (69.6)	6 (26.1)	6 (26.1)

**Table 2:** Characteristics of Respondents in Both Groups.

Characteristics	N	Burnout Group n (%)	Non-burnout Group n (%)	P value
<b>Sex</b>				
Male	22	17 (77.27)	5 (22.73)	0.085
Female	1	0 (0)	1 (100)	
<b>Age Range</b>				
< 30 years	17	7 (77.77)	2 (22.22)	0.735
30 – 40 years	6	10 (71.42)	4 (28.57)	
<b>Year of Residency</b>				
3 <sup>rd</sup> Year	6	5 (83.33)	1 (16.66)	0.409
4 <sup>th</sup> Year	10	6 (60)	4 (40)	
Final Year	7	6 (85.71)	1 (14.28)	
<b>Socio-economic Status</b>				
Average	7	6 (85.71)	1 (14.28)	0.394
Good	16	11 (68.75)	5 (31.25)	
<b>Marital Status</b>				
Single	17	13 (76.47)	4 (23.52)	0.895
Married with no kids	3	2 (66.66)	1 (33.33)	
Married with kids	3	2 (66.66)	1 (33.33)	
<b>Residential Status</b>				
Day Scholar	14	10 (71.42)	4 (28.57)	0.735
Hostelites	9	7 (77.77)	2 (22.22)	
<b>Current Ward Status</b>				
Neurosurgery ward	22	17 (77.27)	5 (22.72)	0.085
On Rotation	1	0 (0)	1 (100)	

showed no significant difference in burnout between the two genders. While the percentage of female neurosurgeons was also low in both studies; 26.6%<sup>12</sup> and 7.1%.<sup>13</sup> The reason behind the low percentage of females in all the studies is that there are fewer females in neurosurgery globally.

In the current study relationship between different demographic factors with burnout was statistically not significant. This parameter is consistent with Attenello et al,<sup>6</sup> who documented a limited effect of personal characteristics on neurosurgical residents' burnout rate. Contrary to that research done by others<sup>2,14</sup> showed that having more children is related to less burnout. In other words, a lack of children is associated with a high rate of burnout. Furthermore, several other factors identified by Attenello et al, which are responsible for high burnout are non-cooperative faculty, inadequate operating room time, lack of appreciation by patients and seniors, and co-resident attitude.<sup>6</sup> Along with these factors, Oliver et al considered the increased use of electronic medical records, responsible for high burnout in neurosurgery residents.<sup>15</sup>

In our study neurosurgery residents confessed that they are burnout and multiple factors responsible for the high rate of burnout are; more workload, prolonged duty hours, especially duties in the neuro-trauma which are critical, no incentives and rewards, decrease interaction with the seniors, decreased or absent basic facilities on the duty floor, extra burden on trainees by taking care of evening IBPP (institutionalized based private practice) patients, conflicts with patient's attendants, which are in abundant, increase number of patients per ward, increase patients and ultimately increase entries in the HMS system, uneducated patients and attendants, wrong referrals from other trauma specialties and periphery, ancillary staff not performing their duties up to the mark, decrease the security of doctors in high-risk areas, lack of ownership by the seniors and no proper accommodation for the

trainee doctors. An international study done by Neal et al,<sup>16</sup> mentioned that more weekly on-call duties are directly proportional to increase burnout in neurosurgery residents. Literature also showed that higher burnout in neurosurgery postgraduate residents is attributed to long duty hours, volatile routine activities, less time for leisure and family, the stress of on-job learning, and difficulty in seeking seniors' consultation for professional help.<sup>17,18</sup>

It is prudent from the literature that residents suffer from a high rate of burnout during the entire phase of training and researchers recommends strategies and assessment to overcome this silent epidemic.<sup>8,11,12,15,17,19</sup>

In the current study; as discussed above the majority of the residents are burnout. Some of the strategies suggested by researchers, to overcome burnout in this vulnerable group are developing support groups, social events, different wellness programs, face-to-face meetings, workload standardization, increased OR times, initiation of some consultation services, and effective interpersonal relationships.<sup>15,17,19,20-23</sup>

In our study, focused group discussions among neurosurgery residents generates and formulated different ways to reduce burnout; proper security of residents and all the staff, appreciation of performance in the form of doctor of the month, rewards, etc., recreational facilities like extracurricular activities at least once a month, duty hours, as well as the job description of the residents, should be defined and if the residents are performing duties beyond that time so then appraisal/rewards should be given, academics should be incorporated more frequently, peripheries should be developed and functional so that unnecessary referrals should be avoided, SOPs for every part of the training should be advised to avoid unnecessary misunderstandings and proper training of the ancillary staff so that every member of the team should work in harmony.

## LIMITATIONS AND FUTURE RECOMMENDATIONS

This was a single center-based study conducted in a public sector tertiary care hospital; thus, results cannot be generalized. Validity and Reliability would have been compromised due to purposive and non-probability convenience sampling and the small sample size as only neurosurgery trainees of one neurosurgery department were included in this research.

Albeit these limitations this research will result in initial knowledge about burnout and ways to reduce it in neurosurgery residents and pave the way for further research in this very field.

## CONCLUSION

The majority of the neurosurgery residents were burnout and there is no statistically significant difference between different demographic factors related to burnout. This study also provided some insight into the rate of burnout and preliminary ways to reduce it among postgraduate neurosurgery residents.

## DISCLOSURE

The author reports no conflicts of interest in this study.

## REFERENCES

1. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organizational Behavior*. 1981; 2: 99-113.
2. Shakir HJ, Cappuzzo JM, Shallwani H, Kwasnicki A, Bullis C, Wang J et al. Relationship of Grit and Resilience to Burnout Among U.S. Neurosurgery Residents. *World Neurosurgery*, 2020; 134: e224-e36.
3. Shakir HJ, McPheeters MJ, Shallwani H, Pittari JE, Reynolds RM. The Prevalence of Burnout Among US Neurosurgery Residents. *Neurosurgery*, 2018; 83 (3): 582-590.
4. Mein G, Martikainen P, Stansfeld SA, Brunner EJ, Fuhrer R, Marmot MG. Predictors of early retirement in British civil servants. *Age Ageing*. 2000; 29: 529-36.
5. Naz S, Hashmi Am, Asif A. Burnout and quality of life in nurses of a tertiary care hospital in Pakistan. *J Pak Med Assoc*. 2016; 66 (5): 532-36.
6. Attenello F, Buchanan I, Wen T, Donoho D, McCartney S, Cen S et al. Factors associated with burnout among US neurosurgery residents: a nationwide survey. *J Neurosurg*. 2018; 129 (5): 1349-63.
7. Junior PK, DeCuyper M, Ragel BT, McCartney S, Couldwell WT, Boop FA. Career Satisfaction and Burnout Among U.S. Neurosurgeons: A Feasibility and Pilot Study. *World Neurosurg*. 2013; 80 (5): 59-68.
8. McAbee JH, Ragel BT, McCartney S, Jones M, Michael LM, DeCuyper M et al. Factors associated with career satisfaction and burnout among US neurosurgeons: results of a nationwide survey. *J Neurosurg*. 2015; 123: 161-173.
9. Di-Rocco F, Giraudat K, Zerah M. Factors affecting the quality of life of young neurosurgeons: a survey. *Acta Neurochir*. 2015; 157 (3): 495-96.
10. Maslach C, Jackson SE. *Maslach Burnout Inventory manual*. 2nd ed. Palo Alto (CA): Consulting Psychologists Press; 1986.
11. Ujjan BU, Hussain F, Nathani KR, Farhad A, Chaurasia B. Factors associated with risk of burnout in neurosurgeons: current status and risk factors. *Acta Neurologica Belgica*. 2022; 122 (5): 1163-8.
12. Baumgarten C, Michinov E, Rouxel G, Bonnetterre V, Gay E, Roche PH. Personal and psychosocial factors of burnout: a survey within the French neurosurgical community. *PloS one*, 2020; 15 (5): e0233137.
13. Yu J, Gao J, Chen J, Sun Y. Academic versus non-academic neurosurgeons in China: a national cross-sectional study on workload, burnout and engagement. *BMJ open*, 2019; 9 (10): e028309.
14. Khalafallah AM, Lam S, Gami A, Dornbos DL, Sivakumar W, Johnson JN, et al. Burnout and career satisfaction among attending neurosurgeons during the COVID-19 pandemic. *Clin Neurol Neurosurg*, 2020; 198: 106193.
15. Tang OY, Dunn KA, Yoon JS, Ponce FA, Sonntag VK, Lawton MT. Neurosurgery resident wellness

- and recovery from burnout: a 39-year single-institution experience. *World Neurosurg.* 2020; 13 8:e72-81.
16. Neal MT, Lyons MK. Burnout and work-life balance in neurosurgery: Current state and opportunities. *Surg Neurol Int.* 2020; 11: 456.
  17. Zaed I, Jaaidane Y, Chibbaro S, Tinterri B. Burnout among neurosurgeons and residents in neurosurgery: a systematic review and meta-analysis of the literature. *World Neurosurg.* 2020; 143: e529-34.
  18. Pulcrano M, Evans SR, Sosin M. Quality of life and burnout rates across surgical specialties: a systematic review. *JAMA Surg.* 2016; 151 (10): 970–78.
  19. Buchholz AL, Henderson Jr F, Lowe S, Alshareef M, Wolgamott L, Patel S, et al. Perspectives from a residency training program following the implementation of a wellness initiative. *World Neurosurg.* 2018; 119:e947-55.
  20. Fargen KM, Spiotta AM, Turner RD, Patel S. Operation La Sierra: a novel wellness initiative for neurological surgery residents. *J Grad Med Educ.* 2016; 8 (3): 457-8.
  21. Thrush CR, Gathright MM, Atkinson T, Messias EL, Guise JB. Psychometric properties of the Copenhagen Burnout Inventory in an academic healthcare institution sample in the US. *Eval Health Prof.* 2021; 44 (4): 400-5. Doi: 10.1177/0163278720934165
  22. Winkel AF. Recovery from the burnout epidemic: how the academic community can help (commentary). *J Grad Med Educ.* 2018; 10: 34-35.
  23. Wolfe SQ, West JL, Hunt MA, Murad GJ, Fox WC, Dow J, et al. A comparison of the existing wellness programs in neurosurgery and institution champion's perspectives. *Neurosurgery*, 2019; 84 (5): 1149-55.

### Additional Information

**Disclosures:** Authors report no conflict of interest.

**Ethical Review Board Approval:** The study was conformed to the ethical review board requirements.

**Human Subjects:** Consent was obtained by all patients/participants in this study.

**Conflicts of Interest:**

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

**Financial Relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

**Other Relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

### AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Muhammad Usman	Study design, methodology, paper writing, data collection analysis of data, and interpretation of results
2.	Shahzad Hussain Waqar	Literature review and referencing, editing, and quality insurer