

# JURNAL BIOMEDIKA DAN KESEHATAN (JOURNAL OF BIOMEDIKA AND HEALTH)

Vol. 6 No. 3 (2023) pp.330-339

e-ISSN: 2621-5470

# **ORIGINAL ARTICLE**

# Relationship Between Fatigue and Burnout Syndrome Among Residents in Anesthesiology and Intensive Therapy Department

Hubungan Antara Kelelahan dan Sindrom Burnout Pada Residen di Departemen Anestesiologi dan Terapi Intensif

Feni Venawati<sup>1</sup>, Andriamuri Primaputra Lubis<sup>2</sup>, Chrismas Gideon Bangun<sup>2</sup>, Yuki Yunanda<sup>3</sup>

<sup>1</sup>Study Program of Anesthesiology and Intensive Therapy, Faculty of Medicine, Universitas Sumatera Utara / Adam Malik General Hospital Medan

<sup>2</sup>Department of Anesthesiology and Intensive Therapy, Faculty of Medicine, Universitas Sumatera Utara / Adam Malik General Hospital Medan

<sup>3</sup>Department Community Medicine, Universitas Sumatera Utara.

#### M andriamuri@usu.ac.id

<sup>©</sup> https://doi.org/10.18051/jbk.330-339

#### ABSTRACT

#### Background

Anesthesiologists in Indonesia are still in high demand. The large number of patients and the heavy workload faced by residents are accompanied by quite high pressure from various aspects, this can cause anesthesia resident participants to experience fatigue so they are prone to a syndrome called burnout syndrome. This study aims to determine the relationship between fatigue and burnout syndrome among residents in the Anesthesiology and Intensive Therapy Department, Faculty of Medicine, Universitas Sumatera Utara.

### Methods

This study was a cross-sectional study on 106 residents that was performed using a questionnaire consisting of characteristics of study samples, translated Fatigue Assessment Scale (FAS), and Maslach Burnout Inventory-Human Service Survey (MBI-HSS).

#### Results

From the analysis, it was discovered that 50% of the residents didn't experience fatigue with a median score of FAS 21.5, and 84.9% of the residents didn't experience burnout syndrome with a median score of MBI-HSS was 51,84  $\pm$  19,59. There was a significant relationship between FAS and total score of MBI-HSS, emotional exhaustion, depersonalization, and personal achievement with p-value <0.001. **Conclusions** 

There was a significant relationship between FAS and total score of MBI-HSS, emotional exhaustion, depersonalization, and personal achievement.

Keywords: Anesthesiology and intensive care residents, Burnout syndrome, FAS, Fatigue, MBI-HSS

### ABSTRAK

### Latar Belakang

Dokter spesialis anestesi di Indonesia masih cukup banyak dibutuhkan. Jumlah pasien yang banyak dan beban kerja berat yang dihadapi oleh para residen disertai dengan tekanan yang cukup tinggi dari berbagai aspek, hal ini dapat menyebabkan peserta PPDS anestesi berkemungkinan mengalami kelelahan sehingga rentan mengalami suatu sindrom yang disebut sindrom burnout. Tujuan penelitian ini mengetahui hubungan antara tingkat kelelahan dan sindrom burnout pada peserta PPDS Anestesiologi dan Terapi Intensif Fakultas Kedokteran Universitas Sumatera Utara.

#### Metode

Penelitian ini merupakan studi potong lintang menggunakan pendekatan kuesioner pada 106 peserta PPDS Anestesiologi dan Terapi Intensif Fakultas Kedokteran Universitas Sumatera Utara. Dilakukan penilaian menggunakan kuesioner yang mencakup data karakteristik sampel penelitian, Fatigue Assessment Scale (FAS), dan Maslach Burnout Inventory-Human Service Survey (MBI-HSS) yang telah diterjemahkan.

#### Hasil

Dari 106 sampel penelitian didapatkan 50% peserta PPDS tidak lelah dengan median skor FAS 21,5 dan 84,9% peserta tidak mengalami sindrom burnout dengan median skor MBI-HSS 51,84 ± 19,59. Terdapat hubungan yang signifikan antara FAS dengan skor total MBI-HSS, kelelahan emosional, depersonalisasi, dan pencapaian prestasi pribadi dengan nilai p <0,001.

### Kesimpulan

Terdapat hubungan yang signifikan antara FAS dengan skor total MBI-HSS, kelelahan emosional, depersonalisasi, dan pencapaian prestasi pribadi.

#### Kata Kunci: PPDS Anestesiologi dan terapi intensif, Sindrom burnout, FAS, Kelelahan, MBI-HSS

## INTRODUCTION

Anesthesiology and Intensive Therapy are important scientific fields in the world of medicine. This field includes handling critical patients, pain management, anesthesia in surgery, monitoring and supporting the vital functions of patients undergoing surgery, management of cardiopulmonary and brain resuscitation problems, fluids, electrolytes, and management of emergency medicine. Anesthesiologists in Indonesia are still in high demand. Anesthesiology and Intensive Therapy Specialist Education Program (resident) is a level of education that must be passed to become an anesthesiologist. HAM Hospital has a large number of patients with a large variety of cases and a high level of difficulty which can lead to consequences such as fatigue for the health workers working in it, including Anesthesiology and Intensive Therapy resident participants.<sup>1,2</sup>

The prevalence of fatigue varies globally around 2.36-75.7%. Fatigue can be caused by personal factors and work factors. Personal factors consist of family or marital status and lifestyle while work factors include physical factors (heavy work, long working hours, poor sleep quality, night watch, standby working hours, work position, and a sedentary workload), mental factors (job stress, high concentration, sustained alertness, anxiety, relationships with coworkers and consultants), and environmental factors (noise, light intensity, temperature, vibration, and humidity).<sup>1,2</sup>

The workload faced by residents is also quite heavy with quite high pressure from various aspects such as shift hours, assignments, educational processes, relationships with seniors and consultants, and critical patients, until recently the case of Corona Virus Disease 2019 (COVID-19)

which quite a lot of casualties including the anesthesiologist.<sup>1</sup> These stressors can cause the resident anesthetic participants to be prone to experiencing a syndrome called burnout syndrome.<sup>3</sup>

The incidence of burnout syndrome among residents ranges from 28% to 45%. Burnout syndrome is characterized as a process that results in physical, mental, and emotional exhaustion as a result of working hard regardless of individual needs, most often occurring among professionals who perform service activities.<sup>3</sup> Research conducted by Basrowi et al. (2020) from the Faculty of Medicine, the University of Indonesia on 1,461 health workers in all provinces of Indonesia in June-August 2020 revealed that as many as 83% of respondents experienced moderate and severe burnout symptoms, the rest were mild (17%). As many as 58.9% of respondents experienced moderate fatigue, and 22.1% of respondents experienced severe emotional exhaustion.<sup>4</sup>

Currently, little research has been found to assess the relationship between fatigue levels and burnout syndrome in Indonesia. Based on this and the background previously mentioned, researchers are interested in knowing the relationship between fatigue levels and burnout syndrome in resident Anesthesiology and Intensive Therapy, Faculty of Medicine, University of North Sumatra.

# **METHODS**

# **Research design**

This study is an analytical study with a cross-sectional study design using a questionnaire approach to determine the relationship between the level of fatigue and the incidence of burnout syndrome in resident Anesthesiology and Intensive Therapy participants at the Faculty of Medicine, Universitas Sumatera Utara.

# Study subjects

The population in this study were all resident Anesthesiology and Intensive Therapy participants at the Faculty of Medicine, University of North Sumatra.

# Sample size determination

The sample size can be calculated using the numerical comparative analytical research formula for two unpaired groups. Data collection was carried out using the total sampling method in which all residents Anesthesiology and Intensive Therapy. Participants filled out a questionnaire in the form of a Google form which consisted of two parts, namely the study sample characteristics section, the FAS questionnaire section to assess fatigue levels, and the MBI questionnaire section to assess burnout syndrome risk. on the research sample.

# Measurements

Participants in resident Anesthesiology and Intensive Therapy of USU Medical Faculty were asked to be willing to become research samples after informed consent. The research sample filled out the demographic, FAS, and MBI-HSS questionnaires distributed by the researchers via Google form. Filling out the questionnaire is done by yourself honestly without being influenced by others. The filling is done within 15 minutes. The completed questionnaires are then collected and statistical analysis will be carried out.

### **Statistical analysis**

Statistical analysis was performed using SPSS (Statistic Package for Social Science) software for Windows. Categorical descriptive data about the characteristics of the research sample, the level of fatigue, and the incidence of burnout are presented in tabular form with frequency and percentage. Numerical data will be presented in the form of mean, median, standard deviation, and range. Bivariate analysis was carried out to assess the relationship between FAS and MBI with the Chi-square test if it met the requirements and the Kruskall-Wallis alternative test.<sup>5</sup>

### **Ethical clearance**

Ethics approval and consent to participate. Permission for this study was obtained from the Ethics Committee of Universitas Sumatera Utara and H. Adam Malik General Hospital.

# RESULTS

### **Descriptive Data Analysis Results**

The study sample was taken at the Anesthesiology and Intensive Therapy Study Program, Faculty of Medicine, University of North Sumatra where the data was taken in September 2022. One hundred and six research subjects were willing to participate in this study.

In this study the research subjects were residents from various semesters, the most subjects were residents in semester 7 (24.5%) and semester 9 (14.2%), with most subjects being married (75.5%) and having children (67.9%). In addition, most subjects had the highest number of duty hours of more than 5 hours per duty shift with the highest sleep duration of less than 5 hours (48.1%).

Characteristics	Total		
	N	%	
Semester			
2 (Two)	9	8,5	
3 (Three)	13	12,3	
4 (Four)	13	12,3	
5 (Five)	10	9,4	
6 (Six)	10	10,4	
7 (Seven)	25	24,5	
8 (Eight)	9	8,5	
9 (Nine)	15	14,2	
Gender			
Man	89	84	
Woman	17	16	
Marital status			
Not married	23	21,7	
Marry	80	75,5	
Widow	2	1,9	
Widower	1	0,9	
Child Status			
Don't have	34	32,1	
Have	72	67,9	
Number of night shifts/month			

## **Table 1. Data Characteristics**

<5x	27	25,5
>5x	79	74,5
Sleep Duration/day		
<5 hours	51	48,1
5 – 7 hours	48	45,3
Income		
Don't have a steady income	90	84,9
Have a steady income	16	15,1
Education Guarantee		
Independent	96	90,6
Scholarship	10	9,4
Spare time		
Never	22	20,8
Exercising	44	41,5
Doing hobbies	40	37,7
Smoking habit		
Do not smoke	67	63,2
Smoke	39	36,8
Drinking Habits		
Do not drink alcohol	105	99,1
Drink alcohol	1	0,9
FAS		
Not tired	53	50
Tired	50	47,2
Extreme Tired	3	2,8
Emotional Burnout		
Low	56	52,8
Currently	33	31,1
High	17	16
Depersonalization		
Low	57	53,8
Currently	30	28,3
High	19	17,9
Achievement of Personal Achievement		
High	14	13,2
Currently	15	14,2
Low	77	72,6
Burnout		
No Burnout	90	84,9
Burnout	16	15,1

This study showed that out of 90 subjects (84.9%) most did not have a clear income (90.6%) and had free time to study and practice (41.5%). in addition, most subjects did not smoke (63.2%) and almost all did not drink alcohol (99.1%).

The study also reported that Fatigue Assessment Scale measurement scores with no fatigue (50%) and followed by fatigue (47.2%). In addition, the emotional exhaustion measurement based on the MBI-HSS showed the lowest results (52.8%) and the depersonalization measurement based on the MBI-HSS showed the lowest results (53.8%). In addition, the personal achievement measurement based on the MBI-HSS showed the MBI-HSS showed the highest results at a low degree (72.6%), but 84.9% reported no burnout.

Data Type	Mean	<u>+</u> SD	Median	Min	Max
Age	31.56	3.04	31	25	39
FAS score	21.84	5.66	21.5	11	37
Emotional Exhaustion Score	17.69	11.57	17	0	52
Depersonalization Score	6.57	5.94	5	0	25
Personal Achievement Score	27.58	9.33	28	0	44
Total MBI-HSS Score	51.84	19.59	51	10	111

In this study, the median age of the research subjects was 31(25 - 39) years. The median FAS score in the study subjects was 21.5(11 - 37). The median emotional exhaustion score based on the MBI-HSS for the subjects of this study was 17(0 - 52). The median depersonalization score based on the MBI-HSS in this study was 5(0 - 25). The mean personal achievement score based on the MBI-HSS for the subjects of this study was  $27.58 \pm 9.33$ . The mean total score of MBI-HSS in this research subject is  $51.84 \pm 19.59$ .

### Result of Analysis of Relationship Between Fatigue Level and Burnout Syndrome

Analysis results were carried out between the level of fatigue and burnout syndrome to determine the relationship between the two. The analysis was carried out using the Kruskal-Wallis test as an alternative test because the number of expected count data was found to be less than 5 and it was known that the difference between groups was >3 so it could not be analyzed using the Chi-Square test, Fisher Exact test, or Mann-Whitney test.

Based on Tables 3, 4, and 5 there is a significant relationship between FAS and depersonalization (p<0.001). It is known that there is a significant relationship between FAS and personal achievement (p<0.001). It is known that there is a significant relationship between FAS and burnout syndrome (p<0.001).

Fatigue		D	eperso	- Total		P-value			
Fatigue	Low		Medium				High		
Assessment Stale	n	%	n	%	n	%	n	%	
Not tired	37	34.91	14	13.21	2	1.88	53.55	50	
Tired	20	18.87	16	15.09	14	13.21	50	47.17	0.001 <sup>a</sup>
Extreme Tired	0	0	0	0	3	2.83	3	2.83	

# Table 3. Table of Test Results of Relationship Between Level of Fatigue and Depersonalization

<sup>a</sup>Kruskal-Wallis

	Personal Achievements								
Fatigue	High		Medium		Low		Total		P-value
Assessment Scale -	n	%	n	%	n	%	Ν	%	_
Not tired	11	10.38	10	9.43	32	30.19	53.55	50	-
Tired	1	0.95	5	4.72	44	41.5	50	47.17	0.001 <sup>a</sup>
Extreme Tired	2	1.88	0	0	1	0.95	3	2.83	

# Table 4. Table of Test Results of Relationship Between Level of Fatigue and PersonalAchievement

<sup>a</sup>Kruskal-Wallis

### Table 5. Table of Relationship Test Results Between Fatigue Levels and Burnout Syndrome

Fatigue Assessment		Burnout S	yndrome	Total		Total	
	Not Burnout		Burn				out
Scale	n	%	n	%	n	%	
Not tired	53	50	0	0	53	50	0.0013
Tired	37	34.91	13	12.26	50	47.17	0.001
Extreme Tired	0	0	3	2.83	3	2.83	

<sup>a</sup>Kruskal Wallis

# DISCUSSION

In this study, a cross-sectional study with a questionnaire approach was conducted on 106 resident participants in Anesthesiology and Intensive Therapy, Faculty of Medicine, University of North Sumatra who were willing to be research samples to determine the relationship between fatigue levels and the incidence of burnout syndrome. The subjects of this study were resident participants who were in the education stage so they were still involved in active service, so it was hoped that they could describe the fatigue score and burnout syndrome during the service process. In addition, the subject is also considered to have the ability to deal with critical conditions and emergencies that occur in various anesthetic procedures.

In this study, the results of measuring burnout with MBI-HSS showed that 90 people (84.9%) did not experience burnout, and as many as 16 people (15.1%) experienced burnout. In this study, as many as 16 residents who were exposed to burnout were not specifically in the lower semester or high semester. An average of 2 people in each semester from semesters 2 to 9 experience burnout. This is not the same as previous research where burnout mostly occurs in the lower semester or upper semester only.<sup>6-8</sup> Then the burnout rate in this study was not as high as in previous studies, namely the residents of the Anesthesiology Faculty of Medicine Universitas Padjajaran at 44% and residents of the Anesthesiology Faculty of Medicine Universitas Indonesia at 65%. This can be due to, among other things, previous research conducted during the COVID-19 pandemic, which can then be caused by differences in demographics, habits, and educational activities.<sup>9-12</sup>

In previous studies, it was found that senior residents, namely fifth-year residents, had the highest levels of emotional exhaustion, depersonalization, and decreased achievement. In general, burnout levels tend to increase as time spent in residency increases. However, several previous studies did not find a significant relationship between the two.<sup>13-14</sup> In previous studies it was also stated that first-year residents had higher levels of emotional exhaustion and depersonalization than second and third-year residents. the highest night guard load per month in the residency

program.<sup>13</sup> In this study, burnout is not specific to the upper or lower semester where there is no special pressure in the lower semester, for example, and the personal factors described above may have a big influence.

The incidence of burnout in previous studies showed varying results. A systematic review showed that the prevalence of burnout among anesthesiology residents varied from 2.7 to 67% with a median of 24.7%.<sup>5</sup> Another study conducted in Singapore showed that the proportion of anesthetic residents who experienced burnout with an MBI-HSS score was 22.4%. In this study, it was also stated that the MBI-HSS could detect burnout more accurately than the MBI score.<sup>15</sup> There is another study from Brazil that shows the prevalence of burnout in residents is quite low compared to other studies, namely 2.70%.<sup>16</sup> The differences in these studies may be due to differences in sociodemographic distribution, such as gender, age, marital status, child ownership, as well as the distribution of night shifts and working hours which may differ in each hospital.

In this study, a significant relationship was found between the level of fatigue and all burnout domains and the total burnout score based on the MBI-HSS (p<0.001). The FAS, which was used to evaluate the level of fatigue in this study, consisted of 10 subjective questions to describe the fatigue experienced by the subject. The level of fatigue is influenced by various factors. Various stressors experienced by doctors working in the anesthetic field, such as heavy workload, often faced with unexpected and stressful situations, as well as personal factors such as not having free time for yourself and your family, can cause physical and mental fatigue, lack of sleep, decreased psychomotor and/or cognitive function, slowed responses, reduced motivation, and disturbed emotions, and affect decision making.<sup>1</sup> This condition is related to the occurrence of burnout syndrome which is characterized by three domains namely emotional exhaustion, depersonalization, and decreased personal achievement.<sup>17-20</sup>

The limitations of our study include the absence of an objective gold standard for assessing fatigue and burnout levels. FAS and MBI-HSS scores are subjective, self-assessments, and may introduce bias in the measurement process and results. In addition, this study does not further analyze personal and work factors that can affect fatigue and burnout.

## CONCLUSION

There was a significant relationship between FAS and total score of MBI-HSS, emotional exhaustion, depersonalization, and personal achievement.

# ACKNOWLEDGEMENT

None

# **AUTHORS CONTRIBUTION**

The contributions of all authors must be described in the following manner: The authors confirm contribution to the paper as follows: study conception and design: Feni Venawti; data collection: Andriamuri P Lubis, Chrismas Gideon Bangun; analysis and interpretation of results: Feni Venawti, Andriamuri P Lubis, Chrismas Gideon Bangun; draft manuscript preparation. All authors reviewed the results and approved the final version of the manuscript.

# FUNDING

No specific funding was received for this study

# **CONFLICT OF INTEREST**

None to declare.

# REFERENCES

- 1. Heriwardito A, Sugiarto A, Setiadi B, et al. Skor Kelelahan pada Peserta Didik Anestesiologi dan Terapi Intensif dan Faktor-Faktor yang Mempengaruhi. Maj Anest Crit Care. 2022;40(1):28–35.
- 2. Vidotti V, Martins JT, Galdino MJQ, et al. Burnout syndrome, occupational stress and quality of life among nursing workers. Enferm Glob.2019;18(3):344–54.
- 3. Sutoyo D, Kruniadi R, Fuadi I. Sindrom Burnout pada Peserta Program Pendidikan Dokter Spesialis Anestesiologi dan Terapi Intensif Fakultas Kedokteran Universitas Padjadjaran. J Anestesi Perioper. 2018;6(3):153–61.
- 4. Bianchi R, Schonfeld I, Laurent E. Burnout Syndrome and Depression. In: Understanding Depression: Clinical Manifestations, Diagnosis and Treatment. 2018. P. 187–202.
- 5. Dahlan S. Menentukan besar sampel. Langkah-langkah membuat Propos Penelit Bid Kedokt dan kesehatan. 2nd ed. Jakarta; Sagung Seto. 2016;p.80–98.
- 6. Chong MYF, Lin SHX, Lim WY, et al. Burnout in anaesthesiology residents: A systematic review of its prevalence and stressors. Eur J Anaesthesiol. 2022;39(4):368–77.
- 7. Gildasio S. De Oliveira, Ahmad S, Stock MC, et al. High Incidence of Burnout in Academic Chairpersons of Anesthesiology. Surv Anesthesiol. 2011;55(3):124.
- 8. Turgut N, Karacalar S, Polat C, et al. Burnout syndrome during residency. Turk Anesteziyoloji ve Reanimasyon Dern Derg. 2016;44(5):258–64.
- 9. Fajardo-Lazo FJ, Mesa-Cano IC, Ramírez-Coronel AA, et al. Professional burnout syndrome in health professionals. Arch Venez Farmacol y Ter. 2021;40(3):248–55.
- 10. Dolunay AB. Burnout status of teachers working in general high schools and technical-trade-vocational high schools" research. Ankara Üniversitesi Tıp Fakültesi Mecmuası. 2002;55(1). Available from: http://search/yayin/detay/16978
- 11. Alhaffar BA, Abbas G, Alhaffar AA. The prevalence of burnout syndrome among resident physicians in Syria. J Occup Med Toxicol. 2019;14(1):1–8.
- 12. Thomas NK. Resident burnout. Jama. 2004;292(23):2880–9.
- 13. Heinemann L V, Heinemann T. Burnout Research: Emergence and Scientific Investigation of a Contested Diagnosis. SAGE Open. 2017;7(1):2158244017697154. https://doi.org/10.1177/2158244017697154
- 14. Lim WY, Ong J, Ong S, et al. The abbreviated maslach burnout inventory can overestimate burnout: A study of anesthesiology residents. J Clin Med. 2020;9(1):1–14.
- 15. Glasberg J, Horiuti L, Novais MAB, et al. Prevalence of the burnout syndrome among Brazilian medical oncologists. Rev Assoc Med Bras. 2007;53(1):85–9.
- 16. Field E, Lingard L, Cherry R, et al. The fatigue paradox: Team perceptions of physician fatigue. Med Educ. 2021;55(12):1388–93.
- 17. Ishak WW, Lederer S, Mandili C, et al. Burnout During Residency Training: A Literature Review. J Grad Med Educ. 2009;1(2):236–42.
- 18. Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. Ann Surg. 2009;250(3):463–70.
- 19. Balch CM, Shanafelt TD, Dyrbye L, et al. Surgeon distress as calibrated by hours worked and nights on call. J Am Coll Surg. 2010;211(5):609–19. http://dx.doi.org/10.1016/j.jamcollsurg.2010.06.393

20. Riad W, Mansour A, Moussa A. Anesthesiologists work-related exhaustion: A comparison study with other hospital employees. Saudi J Anaesth. 2011;5(3):244–7.



This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License