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ORIGINAL RESEARCH

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CLINICAL IMPACTS OF BURNOUT SYNDROME AMONG ANESTHESIOLOGY RESIDENTS: AN OBSERVATIONAL STUDY

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ABSTRACT

Background: Anesthesiology residents have enormous responsibilities and pressure in the workplace that could lead to burnout syndrome.
Burnout can be categorized into emotional exhaustion, depersonalization, and reduced personal accomplishment dimension. Burnout can affect clinical performance and patients' safety. This study examined the relationship between burnout level and clinical performance in anesthesiology residents.
Methods: This was a prospective analytic observational study with a cross-sectional design. The sample size was estimated using the analytical hypothesis test formula with an unpaired numerical measurement scale and an estimated dropout of 10%. Burnout level was determined using Maslach Burnout Inventory and negative clinical performance was measured with the Anesthesiology Residents' Self-Reported Errors and Quality of Care Questionnaire. Data were analyzed using chi-square and unpaired T-Test.
Results: Nineteen subjects (34.5%) suffered from moderate-high burnout levels in the emotional exhaustion dimension. In the depersonalization dimension, 51 subjects (92,7%) suffered from a moderate-high burnout level, and in the reduced personal accomplishment dimension, 28 subjects (50,9%) suffered from a moderate-high burnout level. Mean negative clinical performance scores in subjects with moderate and high burnout level were significantly different from subjects with none and low burnout subjects (26.86 ± 3.63 vs 28.79 ± 2.58, p = 0.045).
Conclusion: Burnout was highly prevalent among anesthesiology residents. In anesthesiology residents, moderate and high burnout levels were significantly correlated with negative clinical performance scores.

Keywords: anesthesiology, burnout, clinical performance, residency

ABSTRACT

Latar Belakang: *Residen anestesi memiliki tanggung jawab dan tekanan yang sangat besar di tempat kerja yang dapat menyebabkan kelelahan. Kelelahan dapat dilihat dari dimensi kelelahan emosi, depersonalisasi dan berkurangnya capaian diri. Kelelahan ini dapat mempengaruhi performa residen sebagai klinisi dan keselamatan pasien. Penelitian ini bertujuan untuk mengetahui hubungan antara tingkat kelelahan dan performa klinis pada residen anestesi.*
Metode: *penelitian ini merupakan penelitian observasional analitik prospektif dengan desain cross-sectional. Besar sampel diperkirakan menggunakan rumus uji hipotesis analitik dengan skala pengukuran numerik tidak berpasangan dan estimasi dropout sebanyak 10%. Tingkat kelelahan ditentukan menggunakan Maslach Burnout Inventory dan performa klinis yang buruk diukur menggunakan kuesioner yang dilaporkan residen anestesi dan mutu perawatan. Data diolah menggunakan uji Chi square dan unpaired T-test.*

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Hasil: *Sembilan belas subjek (34.5%) mengalami kelelahan tingkat menengah-tinggi pada dimensi kelelahan emosional. Pada dimensi depersonalisasi, 51 subjek (97,2%) mengalami kelelahan tingkat menengah-tinggi, dan pada dimensi berkurangnya capaian diri, depersonalisasi, 28 subjek (50,9%) mengalami kelelahan tingkat menengah-tinggi Rata-rata performa klinis negatif pada subjek yang mengalami tingkat kelelahan sedang-tinggi memiliki perbedaan yang signifikan terhadap subjek dengan tanpa kelelahan-level kelelahan rendah (26.86 ± 3.63 vs 28.79 ± 2.58, p = 0.045).*

Kesimpulan: *Terdapat prevalensi kelelahan yang tinggi di kalangan residen anestesiologi. Residen dengan tingkat kelelahan sedang dan tinggi secara signifikan memiliki skor performa klinis negatif yang lebih buruk dibandingkan residen dengan tingkat kelelahan rendah dan tidak mengalami kelelahan.*

Keywords: *anestesiologi, kelelahan, performa klinis, residensi*

PRACTICE POINTS

- The prevalence of burnout among anesthesiology residents is substantial, thus highlighting the significance of prevention as a measure to mitigate the risk of negative clinical performance and its potential deleterious impact on patient care.
- Mitigating burnout in anesthesiology residents necessitates various interventions, including reducing the risk of fatigue related to prolonged shift durations, improving communication with supervisors and peers, and facilitating access to counseling and stress management programs.

INTRODUCTION

A stressful time, residency involves lengthy workdays, difficult schedules, and a lot of work-life conflicts.[1] Sleep deprivation, disagreements with coworkers, trouble adjusting to a new environment, rigorous patient obligations, and a lack of control over time management are just a few of the factors that put residents at risk for burnout.[1,2] Additionally, those who are naturally neurotic or introverted are more vulnerable. In general surgery, orthopedics, obstetrics & gynecology, and anesthesiology, residents have the highest prevalence of burnout syndrome, according to a comprehensive review by Rodrigues et al.[1] Residents in anesthesia typically work in a high-stress workplace that demands awareness, focus, intellect, and multitasking skills. These intense demands and pressures may lead to chronic stress and burnout.

The first report of burnout syndrome among healthcare volunteers took place in 1974. Burnout is a symptom that is defined as a trifecta of depersonalization (negative, callous, and distant behaviors to others), emotional fatigue (emotional overextension and tiredness), and decreased personal accomplishment (feelings of competence and achievement in one's work).[3] Burnout can be referred to as a "state of vital exhaustion" in the 10th version of the International Classification of Diseases by the World Health Organization.[4] The Diagnostic and Statistical Manual of Mental Disorders does not specifically diagnose burnout, although it is a real problem with serious consequences.[3]

Reduced productivity and reduced job satisfaction may be linked to burnout. The prevalence of depression, suicide thoughts, intentions, and attempts were high in burnout states and tended to

drop as people recovered from them.[4] Cardiovascular disease and elevated inflammatory biomarkers are additional hazards. A person's feeling of well-being and capacity to perform completely at work may be hindered by physical symptoms, including sleeplessness, hunger fluctuations, exhaustion, colds or the flu, headaches, and gastrointestinal problems.[6] Productivity and rapport can be significantly impacted by psychological disorders such as low or irritated mood, cynicism, and poor focus.[2] These circumstances will adversely affect productivity and raise the possibility of medical mistakes. It is crucial to understand the prevalence of burnout among anesthesiology residents in developing nations, particularly in Indonesia, and how this may impact their clinical performance due to its negative impacts.

The purpose of this study is to find out the connection between anesthesiology residents' clinical performance and burnout levels.

METHODS

This study was a prospective analytic observational study with a cross-sectional design. The sample size was estimated using an analytical hypothesis test formula with an unpaired numerical measurement scale and an estimated dropout of 10%.

Fifty-five-second until fourth-year anesthesiology residents, who were not on any mental medication treatment, were recruited consecutively from January to February 2019. Anesthesiology residents who were on paid leave, rejected to become the sample and had their shift 24 hours prior to this study were excluded from this study.

The study was held after obtaining ethical approval from the Ethics Committee (No. 0069/UN2.F1/ETIK/2019). The burnout levels assessed based on the Maslach Burnout Inventory (MBI) questionnaire, which consists of 22 questions using a Likert scale ranging from 0 to 6 (0 = never, 1 = a few times per year, 2 = once a month, 3 = a few times per month, 4 = once a week, 5 = a few times per week, and 6 = every day). The MBI questionnaire consists of three dimensions, i.e., emotional exhaustion, depersonalization dimension, and reduction of personal accomplishment dimension. The total score of each dimension would be summed up. The Maslach Burnout Inventory (MBI) questionnaire used here remained in English because the subjects were anesthesiology residents already proficient in English.

In the emotional exhaustion dimension, the subject was categorized as suffering from none-mild (total score <17), or moderate-high (total score > 17). In depersonalization dimension burnout, subjects would be categorized as suffering from none-mild (total score < 7), or moderate-high (total score > 7). In reducing personal accomplishment dimension burnout, subjects would be categorized as suffering from none-mild (total score > 38), or moderate-high (total score < 38). Subjects stated as suffering from moderate-high overall burnout level if they suffered from severe burnout at least in 2 dimensions.

The negative clinical performance was assessed by the Anesthesiology Residents' Self-Reported Errors and Quality of Care questionnaire. The questionnaires used Likert scale 1-5, with score 1=never, 2=rarely, 3=sometimes, 4=often and 5=always. The total negative clinical performance scores were the sum of all answers scale in the questionnaires.

Data were quantified and displayed in tabular form of numeric data. Bivariate analysis using unpaired t-test was performed to assess whether there was a relationship between burnout score and clinical performance. SPSS version 20.0 was applied for the statistical analysis.

RESULTS AND DISCUSSION

Fifty-five active anesthesiology and intensive care residents were successfully recruited. The subjects' characteristics can be seen in Table 1. There was no significant correlation between subjects' characteristics and burnout level.

The burnout score was seen in 3 dimensions, emotional exhaustion, depersonalization, and reduction of personal accomplishment dimension. Most of the subjects (92.7%) suffered from a

Table 1. Correlations between Subjects' Characteristics and Burnout Levels

Characteristic	Frequency (n=55)	Burnout level		
		High (n=36)	None- Low (n=19)	P- value
Age (years old)	30 (26 – 38)			**0,437**
< 30 years old	25 (45,5%)	15 (27,3%)	10 (8,6%)	
> 30 years old	30 (54,5%)	21 (38,2%)	9 (16,4%	
Sex				0,703
Male	28 (50,9%)	17 (30,9%)	10 (18,2%)	
Female	27 (49,1%)	19 (34,5%)	9 (16,4%)	
Domicile				0,637
Self-living	18 (32,7%)	11 (20%)	7 (12,7%)	
Living with	37 (67,3%)	25 (45,5%)	12 (21,8%)	
Family member				
Marriage status				0,351
Single	30 (54,5%)	18 (32,7%)	12 (21,8%)	
Married	25 (45,5%)	18 (32,7%)	7 (12,7%)	
Parental Status				0,908
No children	40 (72,7%)	26 (47,3%)	14 (25,5%)	
Have children	15 (27,3%)	10 (18,2%)	5 (9,1%)	
Residency Level				0,618
Intern	28 (50,9%)	17 (30,9%)	11 (20%)	
Independent	25 (45,5%)	18 (32,7%)	7 (12,7%)	
Plenary	2 (3,6%)	1 (1,8%)	1 (1,8%)	

*Chi-square

moderate-high level of depersonalization dimension burnout. The burnout dimension that was least likely found was the emotional exhaustion dimension (Table 2). Subjects will be stated as the suffering of severe burnout if subjects suffered from moderate-high level burnout for at least 2 dimensions of burnout.

Table 2. Burnout Levels Based on Burnout Dimensions

Burnout level Dimensions	None-low n (%)	Moderate-high n (%)
Emotional exhaustion	36 (65,5)	**19 (34,5)**
Depersonalization	4 (7,3)	51 (92,7)
Reduced of personal accomplishment	27 (49,1)	28 (50,9)

*value in percentage

The subject's negative clinical performances can be seen in Table 3.

The mean of negative clinical performance scores in subjects in the moderate-high burnout category was significantly different from subjects in the none-low burnout category (Table 4).

Table 4. Bivariate Analysis between Burnout Levels and Clinical Performance

Variable	Moderate - High Burnout	None – Low Burnout	P Value
Negative Clinical Performance	28,79 ± 2,58	26,83 + 3,63	0,045*

*Unpaired T-Test

Table 3. Subjects' Negative Clinical Performance

Clinical Performance Points	Median (range)	Likert Scale, n (%)				
		Never	Rarely	Sometimes	Often	Always
I make mistakes without negative consequences to patients	3 (1-5)	1 (1,8%)	4 (7,3%)	25 (45,5%)	23 (41,8%)	2 (3,6%)
I perform procedures without appropriates training	4 (1-5)	1 (1,8%)	2 (3,6%)	13 (23,6%)	15 (27,3%)	24 (43,6%)
I makes mistakes with negative consequences to patients	4 (3-5)	0 (0%)	0 (0%)	9 (16,4%)	31 (56,4%)	15 (27,3%)
I fall short in the quality of care I provide to my patients	4 (2-5)	0 (0%)	1 (1,8%)	16 (29,1%)	28 (50,9%)	10 (18,2%)
I do not have enough time or attention for my patients	3 (2-5)	0 (0%)	1 (1,8%)	29 (52,7%)	16 (29,1%)	9 (16,4%)
I do not monitor the patient in the operating room as closely as I should	4 (2-5)	0 (0%)	1 (1,8%)	14 (25,5%)	14 (25,5%)	26 (47,3%)
I have made medication errors involving the wrong drug or dose in the last year	4 (3-5)	0 (0%)	0 (0%)	5 (9,1%)	27 (49,1%)	23 (41,8%)

*value in percentage

A great deal of scientific evidence has been produced in the last 20 years demonstrating a link between burnout and work stresses. As a result, residency training institutions have become more mindful of the pressures' potential negative impacts on residents. It's essential to recognize these negative consequences and work stresses among residents in anesthesia.[1]

In this research, we found a higher incidence of moderate-high burnout level than other similar studies. In the USA, in 2011-2014, 54.4% medical doctors had burnout symptoms. In the Netherlands, in 2016 only 18% of anesthesiologists suffered from burnout syndromes. In China, in 2014, only 25,4% emergency specialist suffered from burnout syndromes.[7,8] Further research is needed to identify factors that play important role in differences of burnout level between studies, especially in terms of working hours and workload in each country

Burnout among anesthesiology resident can occur due to high workload, parental status, low family support, and alcohol consumption habits.[9] Working more than 70 hours/week was associated with burnout.[10] In addition, less ability in controlling working environment, busy and complex jobs, and high clinical responsibilities result in high levels of stress could trigger burnout.[11] Being young is also known to be linked to burnout. Young anesthesiologists usually feel a high level of responsibility, but on the other hand feel great pressure when facing difficult situations alone.[6]

Most subjects in this study (92.7%) suffered from moderate-high depersonalization of burnout. Depersonalization is one of the burnout dimension where the subjects feel a callous or uncaring feeling, even hostility toward clients or colleagues, i.e., rudeness, and self-isolation, in effort to protect oneself from excessive emotional demands, and often called as the cynicism dimension.[10,12] Study showed that depersonalization was closely related with fatigue due to long shift duration.[13,14]

Depersonalization also is closely related with emotional drain triggered by residents' inability to meet their self-demand. Residents set their self-demand based on their own experience in doctor-patient interaction.[15] Excessive workload may also play an important role in depersonalization burnout, since it can deplete residents' capacity to fulfill the demands. Despite the same working hours duration, subjects in this research had different workload due to the residency hierarchy and workload in each rotation. Chronic excessive workload with less opportunity of rest to recover

and restore balance would lead to depersonalization dimension burnout. A sustainable and manageable workload would give subjects to refine their skill in accordance with their competence and avoid burnout.[11]

The risk of depersonalization could be decreased by providing clear and manageable learning objectives and assignments in each rotation. Despite providing social support at the workplace to protect residents in their decision-making process,[16] anesthesiology residents could also be permitted to play an active role in controlling their own working environment. The rate of burnout can be decreased by offering burnout management using a person-oriented approach.

Half of subjects (50.9%) suffered from moderate-high reduced personal accomplishment dimension of burnout. In this dimension, subjects felt they can't accomplish anything worthwhile at work, which would lead to a lack of learning motivation, poor performance, and an inability to cope with stress. Diminished personal accomplishment reflects residents' problematic relationships with superiors and colleagues. Colleagues and anesthesiology consultants are the residents' source of information regarding their performance and professional life.[15] When relationships with their colleagues and consultants are strained, it would be difficult for residents to find the meaning of their job performance. In addition, during residency, relationships with colleagues and consultants are usually performed in a hierarchical manner and changing it to a more positive relationship would be a challenge.

In our study, the least occurred burnout dimension was the emotional exhaustion dimension (moderate-high emotional exhaustion in 34.5% of subjects, Table 2). The exhaustion dimension was also described as wearing out, loss of energy, depletion, debilitation, and fatigue. Emotional exhaustion usually occurs before depersonalization and reduced personal accomplishment. Emotional exhaustion could be managed by giving counseling and stress management sessions both individually and in groups. Yoga, meditation exercises, or doing sports or hobbies together are some stress management sessions among residents that can be performed.[16,17]

Burnout and negative clinical performance

Negative clinical performance, which was assessed from the Anesthesiology Residents' Self- Reported Errors and Quality of Care, consisted of several behaviors that should be avoided in everyday practice. Average negative clinical performance score in this study was quite high, 27.53 with maximum score 35. Twenty-five (45.5%) subjects stated that they often and always "did not have enough time or attention for their patients". These results were also different with previous studies which showed lesser score.[18,19]

There was a significant correlation between burnout levels and negative clinical performance ($p = 0.045$). Residents in moderate-high burnout level groups tend to do more negative clinical performance than residents in none-low burnout level groups. Poor work performance may have a negative impact on patient care. Therefore, interventions in reducing the burnout levels among anesthesiology residents should be addressed, i.e., a routine counseling stress session, developing support among the residents, early diagnosis and intervention to the residents who are showing burnout symptoms, and encouraging group activities and hobbies among the residents and staffs.[16]

However, there are still limitations in this study. The protective factors that can prevent burnout in anesthesiology residents have not been analyzed yet. Residents who report symptoms of negative clinical performance might also overreport their errors, and this could contribute to the high negative clinical performance score. More reliable methods to measure negative clinical performance can be used in future research. This study also had not studied external factors that can affect burnout such as social factors, and stressors outside the work environment.

CONCLUSIONS

Burnout was highly prevalent among anaesthesiology residents. Residents with moderate-high burnout levels significantly had higher negative clinical performance scores than residents with a non-low burnout level.

The major signs of burnout should be fully understood by residents, and they should also be exposed to programs and services that effectively manage burnout. To create efficient methods to enhance the wellbeing of residents-in-training, more well- designed interventional studies with well specified outcome measures are required.

RECOMMENDATIONS

The findings of this study demonstrate a significant correlation between the high prevalence of burnout among anesthesiology residents and negative clinical performance, which can potentially lead to adverse impacts on patient care. These results can provide a foundation for assessing anesthesiology resident education programs, particularly with respect to their shift length, communication, expectations from supervisors, seniors, and patients, and the effectiveness of counseling and stress management interventions, such as group activities and hobbies for residents.

Furthermore, there is a need for further research to determine the significance of regularly monitoring burnout levels and clinical performance as a means of detecting and addressing potential burnout issues among anesthesiology residents.

CONFLICT OF INTEREST

There is no conflict of interest in relation to the study of the manuscript.

AUTHORS' CONTRIBUTION

Aida Rosita Tantri – conceived and designed the study, conducted research, provided research materials, analyzed and interpreted data, wrote the initial and final draft of the article, and provided logistic support.

Adhrie Sugiarto – conceived and designed the study, conducted research, analysed and interpreted data, wrote final draft of article.

Uyun Mufaza – conceived and designed the study, conducted research, provided research materials, collected and organized data, analysed and interpreted data, wrote initial draft of article.

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