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ORIGINAL RESEARCH

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RELATIONSHIP BETWEEN GENDER, STUDY DURATION AND BURNOUT AMONG MEDICAL STUDENTS

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ABSTRACT

Background: Burnout is a psychological syndrome as a response that arises due to chronic interpersonal stressors at work. Burnout in medical students has a negative impact mentally and physically. This study aims to determine the relationship between gender and study duration with burnout in medical students.
Methods: This study was conducted using an analytical observational method with a cross-sectional study approach using MBI-SS. The population for this study is composed of medical students at the Faculty of Medicine at Universitas Sebelas Maret, specifically those from the classes of 2019-2021. Samples were selected randomly using a stratified random sampling method. The sample size was 247 students. The data were then analyzed using SPSS 22 for Windows.
Results: The results of the analysis showed that there was no significant difference in the level of burnout based on gender with p-value of 0.786, but there was a significant difference in the level of burnout based on the study duration with p-value of 0.044, which the third-year students rank highest in MBI-SS score.
Conclusion: The results of this study indicate that there is no significant relationship between gender and burnout levels but there is a significant relationship between study period and burnout levels. These results indicate that the longer the study duration, the higher the burnout level of students.

Keywords: Burnout, Gender, Medical Student Burnout, Study Duration, MBI-SS

PRACTICE POINTS

- The findings of this study could be used to develop targeted interventions and support programs for medical students, particularly those who are at increased risk for burnout based on their gender and study period.
- Provide insight into ways to improve the well-being of medical students and ultimately, the quality of care provided to patients.

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INTRODUCTION

High levels of stress are associated with academic pressures in high-level medical study programs. Academic pressures such as meeting passing grades, exams, the amount of material to be studied, and time management are significant sources of stress for medical students.[1] This is confirmed by reports of high levels of anxiety, depression, burnout, and psychiatric distress among medical students.[2]

Burnout is defined as a psychological syndrome that arises as a response to chronic interpersonal stressors at work. There are three main components in this response, including emotional exhaustion (EE), feelings of cynicism or depersonalization (DP), and reduced personal accomplishment (RPA). The significance of the three-dimensional model is to place stress feelings and individual perceptions of oneself and others.[3]

Work demands have a significant impact on the likelihood of burnout.[4] This condition is described by three main components: emotional and physical exhaustion, cynicism or negativity towards the job, and professional inefficacy. In burnout, exhaustion is described as a feeling of depleted physical and emotional energy. Exhaustion is a representation of stress in individuals experiencing burnout. Cynicism/Depersonalization is portrayed as a negative response or apathy in individuals experiencing burnout. Cynicism is a representation of interpersonal problems in individuals experiencing burnout. Professional inefficacy is described as feelings of low self-worth or self-doubt.[3] Initially, burnout was thought to only occur in people in service-oriented professions, but other studies have shown that it can also occur in other professions such as students and medical students.[5] Even a study has shown that the prevalence of burnout among medical students in some countries reaches 44.2%.6 This is certainly worrying because burnout is also linked to the desire to drop out and suicide among medical students.[7]

Factors that influence burnout include situational factors such as job characteristics, occupational characteristics, and organizational characteristics. Additionally, individual factors such as marital status, education level, and age can also play a role. Research has shown that younger individuals are more at risk for burnout, although this is also related to experience.[8]

Social support and coping mechanisms have been found to be important in increasing resilience to burnout among medical students. Studies have also found that women more often report emotional exhaustion as a component of burnout, while men more often report depersonalization. Furthermore, research has shown that the prevalence of burnout among female medical students is higher than among male students.[9,10] Factors such as transition periods, background, gender, low grades, academic demands, school activities, resilience level, and family problems contribute to burnout among students as well. It is crucial to recognize the significance of these factors and provide support to those who may be at risk of burnout.[11,12]

The consequences of burnout reverberate across multiple domains, casting a wide net of impact that encompasses the well-being of medical students. This assertion finds support in the investigations conducted by Mata and Slavin,[13,14] which emphasize the potential for burnout to catalyze subsequent complications such as depression, challenges in maintaining focus and concentration, and difficulties in academic performance. Notably, the scope of these repercussions extends beyond the academic sphere, permeating into the trajectory of students as they transition into the role of practicing physicians. Further underpinning the gravity of the issue, one study underscores that burnout among physicians can set the stage for compromised patient care, decreased productivity, and a significant diminishment of the overall well-being of healthcare providers.[15]

However, within the realm of medical education in Indonesia, dedicated research focusing on burnout, particularly during the preclinical stages, has remained relatively scarce. While existing literature has shed light on the prevalence and the relation between burnout and coping mechanisms among residents in Indonesia,[16] a considerable gap persists in our understanding of the landscape of burnout among preclinical medical students. This scarcity

is particularly notable concerning the interplay of gender and study duration in relation to burnout experiences. This pivotal area of inquiry, essential for understanding the factors that shape burnout among medical students, remains largely unexplored. Thus, this study aims to determine the relationship between gender, study length, and burnout levels among medical students at Universitas Sebelas Maret.

METHODS

This study employs an observational analytical design with a cross-sectional approach. The research took place at the Faculty of Medicine at Universitas Sebelas Maret. The study's population consisted of undergraduate students in the Medicine program at Universitas Sebelas Maret, specifically those enrolled in the classes of 2019-2021. The sample of students were selected from this population based on active enrollment in the Medicine program and willingness to participate in the research. The samples were chosen using a random sampling technique, specifically a proportionate stratified random sampling method. The sample size was calculated using the OpenEpi application, with a population size of 690 students and a margin of error of 5%, resulting in a sample size of 247 students.

The sample was divided into three strata, corresponding to the classes of 2021, 2020, and 2019. The class of 2021 has completed their second semester of medical school and is currently focused on foundational medical studies. The class of 2020 just finished their fourth semester and started to study more advanced matters. The class of 2019 just finished their sixth semester and already learned more complex matters and have just started doing their mini-thesis.

The questionnaire used was the Maslach Burnout Inventory-Student Survey (MBI-SS), containing 21 questions categorized as favorable and unfavorable items. The MBI-SS was adopted and translated into Bahasa Indonesia from Schaufeli et al.[17] by Nurcahyanti.[18] The MBI-SS questionnaire was then tested for validity with a correlation test which resulted in a validity coefficient for exhaustion between 0.665 and 0.829, depersonalization between 0.495 and 0.808, and reduced personal accomplishment between 0.387 and 0.773. The reliability of the MBI-SS was also tested with Cronbach's alpha and the result is the questionnaire has a reliability coefficient for exhaustion at 0.77, depersonalization (cynicism) at 0.69, and personal accomplishment at 0.78.

The questionnaire employs a 7-point rating scale to assess burnout, with scores ranging from 0 (never experiencing the item) to 6 (always experiencing the item). For favorable items, scores range from 0 to 6, with higher scores indicating a higher level of burnout. For unfavorable items, scores range from 0 to 6, with lower scores indicating a higher level of burnout. A score of $X \geq 52.21$ is considered to indicate high levels of academic burnout.

In this study, we have obtained permission from the faculty and obtained ethical clearance to proceed with our research. We successfully selected an appropriate sample through random sampling and distributed the MBI-SS survey in the Indonesian language to our study participants. The scores obtained from the MBI-SS survey have been calculated to provide data for assessing the level of burnout. Subsequently, we conducted a statistical analysis of the collected data. To test for the normality of data distribution, we applied the Kolmogorov-Smirnov test. To explore gender-based differences in burnout, we employed an Independent Sample t-test. Additionally, an ANOVA test was utilized to investigate variations in burnout across groups categorized by the duration of the study. The data processing was carried out using SPSS software.

This study has passed an ethical review by the Research Ethics Committee of the Faculty of Medicine Sebelas Maret University number 40/UN27.06.11/KEP/EC/2022.

RESULTS AND DISCUSSION

The findings of this research reveal that levels of burnout do not significantly differ between male and female medical students across various lengths of study durations. However, a noteworthy surge in burnout becomes apparent among students who have completed three years of medical education, irrespective of gender. In terms of gender-based

analyses, the dimension of emotional exhaustion presents a higher average among female students in contrast to their male counterparts. Conversely, male students exhibit higher averages in depersonalization and reduced accomplishment dimensions, suggesting a greater struggle with detachment and diminished personal satisfaction in their studies.

role of the third year as a potential turning point in the experience of burnout, marked by elevated challenges related to feelings of detachment and reduced accomplishment. This study offers valuable insights for educational institutions and support systems, emphasizing the need to address these specific challenges faced by medical students,

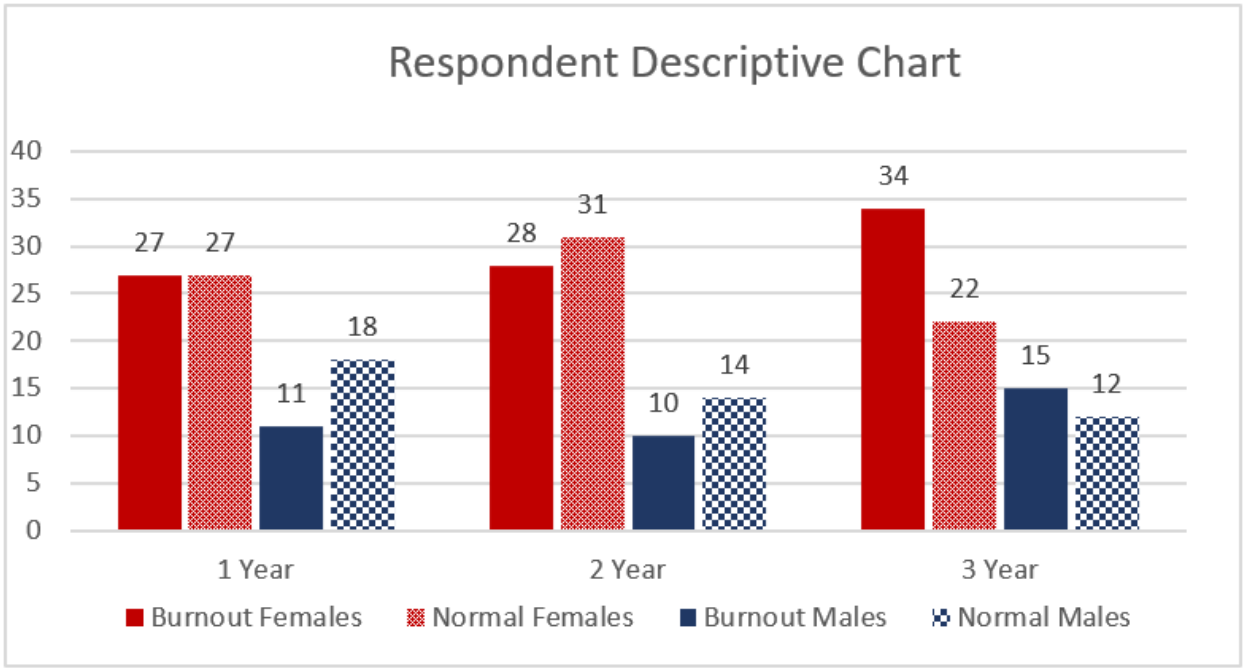

Figure 1. Respondent Descriptive Chart

In examining the impact of study duration, emotional exhaustion does not exhibit a significant increase across any group. In contrast, the dimensions of reduced accomplishment and depersonalization experienced a substantial increase during the third year of study. These results underscore the pivotal

particularly in this critical phase of their education. Such comprehensive understanding can contribute to the development of targeted interventions that address the unique burnout dynamics encountered by medical students and promote their well-being throughout their educational journey.

Table 1. Mean and SD Score of MBI-SS Based on Gender and Study Duration

		EE (0-30)	RPA (0-72)	DP (0-24)
Gender	Females	17.58±0.43	26.30±0.72	7.87±0.34
	Males	15.87±0.67	27.85±1.26	8.70±0.56
Study Period	1 Year	16.73±0.70	25.17±0.97	7.42±0.44
	2 Year	17.05±0.52	26.17±1.07	7.45±0.46
	3 Year	17.34±0.68	29.04±1.20	9.53±0.57

The Kolmogorov-Smirnov test was employed to assess the normality of the research data. The results of the normality test using the Kolmogorov-Smirnov test revealed a significance level of 0.200, indicating that the data in this research follows a normal distribution. The Levene test was utilized to examine whether the data from the research outcomes in both gender groups exhibit uniform variance values. The results of the Levene test displayed a significance level of 0.449, suggesting that the research data can be considered to exhibit equivalent variance (homogeneity).

Table 2. Difference of Burnout Levels between Men and Women

					95% CI	
	T	df	p	Mean Diff.	Lower	Upper
MBI-SS Score	-0.271	247	0.786	-0.665	-5.490	4.160

An unpaired t-test was used to determine whether there is a significant difference in the level of burnout between the two gender groups. The results of the unpaired t-test showed a significance level of 0.786. The result can be concluded that there is no significant difference in burnout levels between men and women.

Table 3. Differences in Burnout Dimensions between Men and Women

					95% CI	
	T	df	p	Mean Diff.	Lower	Upper
EE	2.189	247	0.030*	1.70894	0.17104	3.24684
DP	-1.324	247	0.187	-0.82561	-2.05424	0.40302
RPA	-1.138	247	0.256	-1.54810	-4.22674	1.13054

*statistically significant

An unpaired t-test was conducted to assess whether a significant difference exists in each dimension of burnout between the two genders. The results of the test revealed a significant difference in the dimension of exhaustion, with a significance level of 0.03. This finding suggests that female students experience a higher level of exhaustion compared to their male counterparts. These findings align with the research conducted by Frajerman et al. which demonstrated no significant difference in the overall level of burnout between men and women.[6] Similar results were observed in another study, which also indicated no substantial difference in burnout levels between the genders.[19]

However, a contrary outcome emerged from the study conducted by Backović et al. where a notable difference in burnout levels between men and women, particularly in the exhaustion dimension, was observed.[9] This discrepancy could potentially be attributed to contextual factors, differing methodologies, or cultural variations influencing the perceived experiences of burnout across gender groups.

Palupi and Findriyanti, argue that intrinsic factors may underlie these results, with women potentially being more inclined to conceal their emotions and exhibit heightened emotional responses than men.[20] They contend that while women might demonstrate a propensity for higher exhaustion-related burnout, overall levels of burnout between genders show no significant divergence.

This interpretation gains further significance in the context of Indonesia's evolving gender dynamics. Gender equality advancements could conceivably influence the competitive landscape

experienced by both male and female students, attenuating the gender-based differences in burnout levels. As the academic environment becomes increasingly equitable, the traditional gender roles and expectations that might have led to differential experiences of burnout could be gradually equalized.

Furthermore, the multifaceted nature of burnout extends beyond individual experiences, encompassing social support systems and job characteristics that can substantially contribute to its development. The interplay between these factors and gender, as discussed in prior studies,[21] could offer nuanced insights into the observed burnout patterns. It is plausible that variations in social support networks and the inherent demands of medical education interact with gender differences to shape the burnout landscape.

Shifting the focus to study duration, an ANOVA test was employed to explore potential variations in burnout levels among groups with varying study periods. The results of this analysis revealed a statistically significant discrepancy in average burnout levels across the three study period groups (p-value = 0.044). This finding suggests that the stage of medical education plays a discernible role in influencing burnout levels among students. To further elucidate these differences, a post hoc test using the Tukey method was applied, allowing for the identification of specific contrasts between distinct study period groups.

Table 4. Differences of Burnout Between 1st, 2nd, and 3rd Year Students

(I) Study Period	(J) Study Period	Mean Diff.	p
1 year	2 years	-1.337	0.879
	3 years	-6.578	0.047*
2 years	1 year	1.337	0.879
	3 years	-5.241	0.142
3 years	1 year	6.578	0.047*
	2 years	5.241	0.142

*statistically significant

The outcome of the ANOVA test indicated a significant distinction between the group of first-year students and third-year students, with a significance value of 0.047. This finding aligns with the study conducted by Nteveros et al which similarly established a correlation between the duration of study and burnout levels among medical students.[22] The ANOVA test results further suggest a progressive rise in burnout levels with an increasing study duration. This pattern could potentially be attributed to the escalating academic demands that students encounter as their study duration lengthens. The amplified academic burden may foster stress and fatigue, contributing to an augmented susceptibility to burnout. One study also documented an analogous relationship between prolonged study duration and intensified academic workload.[23] However, it is essential to recognize that extended study duration does not unilaterally translate to heightened burnout levels for every student. The burnout experience is multifaceted and influenced by a myriad of factors, including social support systems and individual coping mechanisms. These additional factors could mitigate or exacerbate burnout experiences, underscoring the intricate nature of the phenomenon.[10]

Following this, a subsequent ANOVA test was conducted to dissect differences within each burnout dimension across study duration groups, encompassing exhaustion, depersonalization, and reduced personal accomplishment. The outcomes of this analysis unveiled significant differences in the levels of depersonalization and reduced personal accomplishment, with significance values of 0.003 and 0.034, respectively. However, no substantial differences emerged in the dimension of exhaustion among the three study period groups.

This outcome diverges from the findings of the study by Zis et al. which reported a noteworthy correlation between study duration and dimensions of emotional exhaustion and depersonalization.[24] The study suggests that remote learning could potentially contribute to escalated burnout experiences in these dimensions. It's worth noting that the shift to remote learning, especially in light of the global events surrounding the COVID-19 pandemic, could introduce additional stressors and challenges that might influence the burnout landscape.

Table 5. Differences in Burnout Dimensions Between 1st, 2nd, and 3rd Year Student

	Sum of Squares	df	Mean Square	F	p
EE	15,068	2	7.534	0.224	0.799
DP	243,205	2	121.602	6.010	0.003*
RPA	668,972	2	334.486	3.414	0.034*

EE = Emotional Exhaustion DP= Depersonalization RPA=Reduced Personal Accomplishment

These observations collectively emphasize the dynamic nature of burnout experiences among medical students and underscore the need for comprehensive investigations into the interplay of various factors that contribute to burnout across different dimensions and study duration groups. first-year and third-year student groups (p-value = 0.0033). Consequently, it can be deduced that a significant variation in burnout levels exists across study duration groups, particularly evident within the dimensions of depersonalization and reduced personal accomplishment. This implies that students

Table 6. Post hoc Test Between Study Groups

Dependent	(I) Study Period	(J) Study Period	Mean Diff.	p
DP	1 year	2 years	-0.02410	0.999
		3 years	-2.10843*	0.008*
	2 years	1 year	0.02410	0.999
		3 years	-2.08434*	0.009*
	3 years	1 year	2.10843*	0.008*
		2 years	2.08434*	0.009*
	1 year	2 years	-.00000	0.792
RPA		3 years	-3.86747*	0.033*
	2 years	1 year	1.00000	0.792
		3 years	-2.86747	0.151
	3 years	1 year	3.86747*	0.033*
		2 years	2.86747	0.151

EE = Emotional Exhaustion DP= Depersonalization RPA=Reduced Personal Accomplishment
*statistically significant

The outcomes of the Tukey post hoc test underscore significant differences within dimensions of burnout among distinct study duration groups. Specifically, a noteworthy distinction is observed in the dimension of depersonalization between the first-year and third-year students (p-value = 0.008), and between the second-year and third-year students (p-value = 0.009). Additionally, a significant variation is evident in the dimension of reduced personal accomplishment between the in their third year of study are more susceptible to experiencing depersonalization and reduced personal accomplishment compared to their peers in the first and second years of study.

Third-year students demonstrate higher levels of depersonalization in comparison to their first and second-year counterparts, likely stemming from increased academic demands and stress. Additionally, third-year students report reduced personal accomplishment when compared to

first-year students, which could be attributed to heightened pressures and a diminishing sense of achievement over the course of their studies.

The dimensions of burnout, as illuminated by these findings, warrant meticulous consideration in the domain of research focused on student burnout levels. The identified disparities underscore the multifaceted nature of burnout experiences, impacted by the evolving demands and challenges encountered during the progression of medical studies. It's important to recognize that the educational journey may elicit distinct psychological responses at different junctures, influencing the manifestation of burnout dimensions.

In order to delve deeper into the relationship between the variables under investigation, we employed a regression analysis method. Specifically, our study aimed to assess the impact of two key variables, namely gender and study duration, on the occurrence of burnout. Through this analytical approach, we sought to uncover valuable insights into how these factors contribute to the manifestation of burnout among the participants in our study.

The results of our regression analysis revealed intriguing patterns. First and foremost, we identified a significant association between study duration and the incidence of burnout, as indicated by a p-value of 0.018. This finding signifies that the duration of one's study journey indeed exerts a discernible influence on the occurrence of burnout. This influence manifested as a positive correlation, suggesting that as study duration increases, there is a corresponding increase in the likelihood of experiencing burnout. This observation underscores the complex interplay between the demands of extended academic engagement and the potential toll it might take on an individual's psychological well-being.

On the other hand, our analysis indicated a lack of statistically significant influence between gender and the occurrence of burnout, as reflected by a p-value of 0.727. This result suggests that gender does not play a substantial role in determining whether an individual is more or less susceptible to experiencing burnout. While this finding might seem counterintuitive given the growing awareness of gender-related disparities in various contexts, it is essential to consider that burnout is influenced by a multitude of factors beyond gender alone. It is possible that other variables, such as study workload, support systems, and personal coping mechanisms, play a more prominent role in determining burnout outcomes.

In summary, our regression analysis has provided valuable insights into the interrelationship between study duration, gender, and the occurrence of burnout. While study duration appears to be a significant predictor of burnout, indicating a positive influence, gender did not exhibit a noteworthy impact on burnout occurrence. These findings contribute to our understanding of the nuanced dynamics that contribute to burnout and underscore the need for comprehensive strategies that encompass a wide array of factors to effectively address and mitigate burnout experiences. Further research could delve into exploring the intricate interactions between these variables and potentially uncover additional dimensions that contribute to burnout within specific demographic groups or academic contexts.

Further insight is provided by research conducted by Palupi and Findriyanti,20 which highlights the intricate relationship between coping mechanisms and burnout dimensions. Their work accentuates that maladaptive coping strategies exhibit a substantial association with depersonalization and reduced personal accomplishment. Conversely, the adoption of adaptive coping mechanisms, rooted in emotional support, religious practices, and humor, displays a negative correlation with depersonalization and reduced personal accomplishment. This insight reinforces the significance of addressing coping mechanisms as a potential avenue for mitigating burnout among medical students.

Intervention strategies encompassing fail-pass grading systems, self-development groups, mindfulness techniques, and comprehensive approaches can prove effective in alleviating burnout. Studies have revealed that the utilization of a fail-pass grading system during the first year of study corresponds to lower burnout levels. Self-development groups can serve as a viable avenue

for stress reduction among medical students. Furthermore, mindfulness techniques have exhibited the potential to mitigate stress and anxiety in this demographic. A comprehensive approach program has also demonstrated the capability to significantly alleviate symptoms of depression and suicidal ideation in medical students. It is noteworthy, however, that the available research on these interventions may be constrained by the limited number of studies.[25]

In conclusion, the comprehensive analysis provides valuable insights into the nuanced landscape of burnout among medical students during different study durations. It underscores the importance of recognizing and addressing burnout dimensions individually, as well as the potential effectiveness of tailored interventions. These findings contribute to the body of knowledge aimed at supporting the well-being and academic success of medical students, thereby prompting the need for further investigation into effective interventions and coping strategies to mitigate burnout.

The current study underscores a substantial prevalence of burnout among medical students. Although no significant gender-based difference in burnout levels is detected, the dimension of exhaustion exhibits a relatively higher impact on female students. This could be attributed to the interplay of coping mechanisms and the differing social support environments between genders. Furthermore, a significant difference is identified among students of varying study durations. This variance could be attributed to the elevated complexity of learning materials and the increased burden, particularly noted in the class of 2019, associated with commencing their mini-thesis.

The implications of these findings are invaluable for educators and stakeholders, as they shed light on the urgency of addressing the high prevalence of burnout among medical students. Employing strategies such as mindfulness training and self-development groups can potentially serve as effective tools in reducing burnout among this demographic.

The current research study has a few limitations and shortcomings, which include the following:

1. Time bias, as the data collected from all respondents was not conducted within a specific time frame.
2. The research was conducted on respondents who were experiencing hybrid learning.
3. The absence of other risk factors in the study. It is worth noting that this research is only conducted on a specific population and may not be generalizable to other populations.

Furthermore, the reliance on self-reported data introduces the possibility of social desirability bias or underreporting. These limitations suggest avenues for future research to delve deeper into the complex dynamics of burnout among medical students and to explore interventions that could comprehensively mitigate its impact.

CONCLUSIONS

The result of this study has shown that there is not a statistically significant relationship between gender and the level of burnout, but there is a significant relationship between the study period and the level of burnout among medical students. Furthermore, the study found that there are significant differences in the dimensions of burnout, specifically in depersonalization and personal accomplishment, among different groups of study duration.

RECOMMENDATIONS

In light of these findings, it is recommended that further research be conducted in order to investigate the relationship between other risk factors, such as coping mechanisms, and burnout in medical students. Additionally, it is also important for policymakers and program managers to develop policies and interventions that can help students who are experiencing burnout, especially for the final-year students who score the highest in burnout level. Such interventions could include fail-pass grading systems, mindfulness-based interventions, self-development groups, and a comprehensive approach that includes counseling, education, and awareness campaigns. Overall, this study highlights the importance of addressing burnout among medical students in order to ensure their well-being and academic success.

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COMPETING INTEREST

The authors declare that there are no competing interests regarding the study in this manuscript.

LIST OF ABBREVIATION

EE : Emotional Exhaustion

DP : Depersonalization

RPA : Reduced Personal Achievement

MBI-SS : Maslach Burnout Inventory - Student Survey.

AUTHORS' CONTRIBUTION

Zulfan – Wrote the first draft and conducted the survey and data collection. Additionally, responsible for analyzing the data collected.

Eti Poncorini – Co-conceived the research idea of the research, assisted in data analysis, and provided supervision for the data collection process.

Maryani – Verified the analytical method and analyzed the results.

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