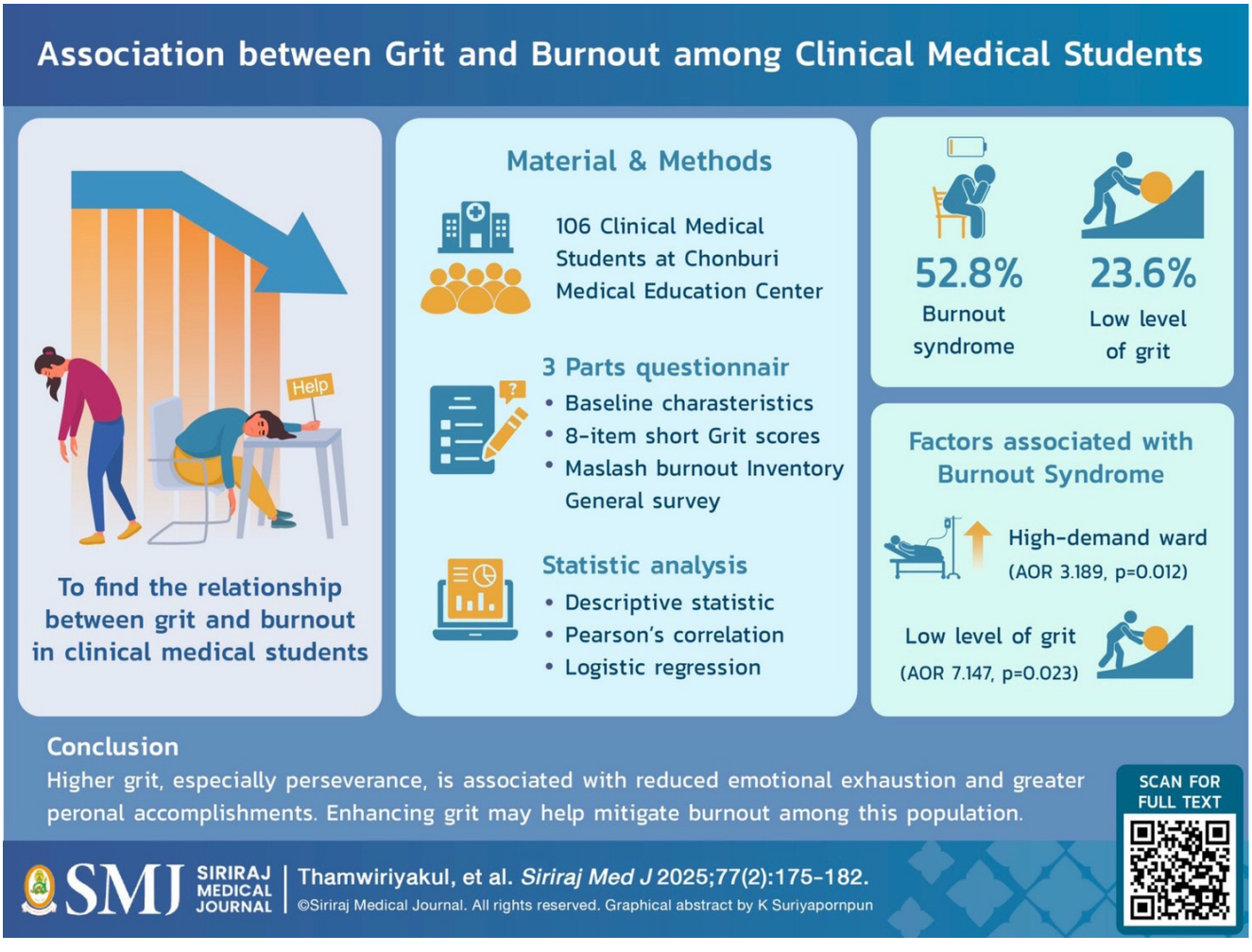
Association between Grit and Burnout among Clinical Medical Students

Nirucha Thamwiriyakul, M.D.[1], Supitcha Thamissarakul, M.D.[1], Prakasit Wannapaschaiyong, M.D.[2,*]

[1]Chonburi Hospital Medical Education Center, Chonburi 20000, Thailand, [2]Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.



*Corresponding author: Prakasit Wannapaschaiyong
E-mail: prakasit.wan@mahidol.ac.th
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ORCID ID:http://orcid.org/0000-0001-7099-0183
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ABSTRACT

Objective: The purpose of this study was to determine the relationship between grit and burnout among clinical medical students.

Material and Methods: A cross-sectional descriptive study was conducted between December 2023 and January 2024 at the Chonburi Medical Education Center. Data from 106 clinical medical students were gathered using the 8-item Short Grit scale and the Maslach Burnout Inventory General Survey. Descriptive statistics, Pearson's correlation, and logistic regression were used to analyze the data.

Results: Among the 106 clinical medical students, 52.8% met the criteria for burnout syndrome. 44.3% had high levels of emotional exhaustion and 32.1% had high levels of depersonalization. However, most of these medical students had moderate levels of total grit, passion, and perseverance. Pearson's correlation analysis showed that total grit and perseverance scores were negatively correlated with emotional exhaustion and positively correlated with personal accomplishments. Further analysis using multivariate logistic regression revealed that burnout syndrome in clinical medical students was significantly associated with high-demand ward responsibility (AOR 3.189, p = 0.012) and low levels of total grit (AOR 7.147, p = 0.023).

Conclusion: Burnout is prevalent among clinical medical students, particularly among those with high-demand ward responsibilities and low grit levels. Higher grit, especially perseverance, is associated with reduced emotional exhaustion and greater personal accomplishments. Enhancing grit may help mitigate burnout among this population.

Keywords: Grit; burnout; clinical medical students (Siriraj Med J 2025; 77: 175-182)

INTRODUCTION

Burnout syndrome, a psychological condition resulting from chronic work-related stress, affects individuals across various professions, with medical students experiencing particularly high prevalence rates.[1,2] A global meta-analysis reported that the burnout rate among medical students was 44.2%, ranging from 33.4% to 55.0%.[3] More recent evidence suggests that these high rates persist. A systematic review by Di Vincenzo et al. (2024) reported that burnout prevalence among medical students can be as high as 88%[4], underscoring the severity and persistence of the problem. This high prevalence is especially concerning for clinical medical students who undergo practical training in hospital wards, where stressors are more intense compared to preclinical years.[5]

The clinical years of medical training, in particular, are a period of heightened vulnerability to burnout. During these years, students transition from predominantly classroom-based learning to high-pressure, patient-focused clinical environments. They must rapidly assimilate knowledge, refine their clinical skills, and navigate complex professional hierarchies, often with limited decision-making authority. Chronic exposure to demanding work schedules, challenging interpersonal interactions, high academic expectations, and insufficient rest contribute substantially to psychological distress.[6,7] Many previous studies have highlighted that sustained burnout during these formative clinical years not only undermines students' mental health and academic engagement but may also erode their clinical competencies and empathy, subsequently affecting patient care quality and their future professional satisfaction.[1,4,8]

Researchers have explored various factors that might mitigate or regulate burnout levels among medical students. One such factor is "grit", which is defined as sustained passion and perseverance for long-term goals.[9] Grit has been recognized as a critical trait for learners, predicting high academic performance and lower attrition rates in multiple disciplines.[10] Medical students with high levels of grit tend to persevere in the face of challenges, potentially counteracting burnout.[11] Grit also appears to provide mental health benefits, such as lower levels of depression and anxiety. Although multiple determinants, such as workload, interpersonal conflicts, and institutional policies,[1-4] have been implicated in the development of burnout, we focused on grit in this study because it is an intrinsic, potentially modifiable personal characteristic.[9,10] By understanding grit's role, we may identify strategies to enhance students' resilience and their capacity to cope with the inevitable stressors of clinical training.

Existing studies on the relationship between grit and burnout have notable limitations. Many studies have focused on postgraduate trainees[12-16] or general medical students[17,18], there is a marked absence of studies specifically targeting clinical medical students. This represents a

critical gap in understanding this subgroup's grit and burnout dynamics. Furthermore, no prior studies have explored this relationship among medical students in Thailand, underscoring the need to address geographic and cultural nuances in the literature.

Given these gaps, this study aims to explore the association between grit and burnout among clinical medical students at the Chonburi Medical Education Center in Thailand. By addressing these limitations, the findings of this study could inform the development of targeted interventions to support mental health and academic resilience in medical trainees.

MATERIALS AND METHODS

Study design and population

This cross-sectional study was conducted with clinical medical students at the Chonburi Medical Education Center between December 2023 and January 2024. A total of 106 clinical medical students completed an online questionnaire using Google Forms. Because all 106 enrolled clinical medical students at the time of the study agreed to participate, we obtained complete participation rather than a traditional response rate calculation. No formal sample size calculation was performed, as we included the entire population of clinical medical students as a convenience sample. This study was approved by the Chonburi Hospital Research Ethics Committee (code 145/66/S/q).

Data collection

The authors invited students to participate in various student activities. The anonymous electronic questionnaire included information regarding the purpose of the research, consent forms, and study questionnaires. The participants had the right to choose to participate in the research project or decline.

The questionnaire consisted of three parts: demographic information, the 8-item Short Grit Scale (Thai version), and the Maslach Burnout Inventory-General Survey (Thai version). Demographic information collected included sex, age, academic year, current ward responsibilities, cumulative grade point average (GPAX), and intention to pursue medicine.

The 8-item Short Grit Scale (Thai version)[19] was used to assess grit. This instrument comprises two dimensions, consistency of interest (passion) and perseverance of effort (perseverance), each consisting of four items. Participants' responses were recorded on a 5-point Likert scale ranging from 'very much like me' to 'not like me at all'. Higher scores in passion, perseverance, and total grit indicated a stronger drive to improve, persistence in goals, and long-term commitment, respectively. The scores were classified as low (below the 25th percentile), moderate (25-75th percentile), or high (above the 75th percentile). The scale exhibited acceptable internal consistency with a Cronbach's alpha coefficient of 0.69, as reported in the Thai version.

The Maslach Burnout Inventory-General Survey; MBI-GS (Thai version)[20] was utilized to assess burnout among medical students in this study. This 22-item questionnaire is designed to evaluate three dimensions of burnout: emotional exhaustion (nine items), depersonalization (five items), and personal accomplishment (eight items). Responses were measured on a 7-point frequency scale ranging from 'never' to 'every day,' with higher scores in emotional exhaustion and depersonalization, and lower scores in personal accomplishment, indicating more severe symptoms of burnout. Each dimension's results were categorized into three severity levels: low, moderate, and high. A higher severity level reflects more pronounced symptoms within that dimension. For this study, participants were considered to have burnout syndrome if they scored at the high level for emotional exhaustion and/or depersonalization.

The MBI-GS was selected for its ability to comprehensively measure burnout in contexts that involve high work-related stress. While the tool is typically applied to general populations, its structure and scope are well-suited for medical students, who often experience stressors resembling those faced by medical personnel, such as patient care responsibilities, academic pressures, high expectations from peers and supervisors.

The reliability of the MBI-GS in this study was satisfactory, with Cronbach's alpha coefficients of 0.86 for emotional exhaustion, 0.86 for depersonalization, and 0.77 for personal accomplishment, indicating good internal consistency.

Statistical analyses

Data analysis was performed using SPSS software (version 23). Descriptive statistics were used to summarize demographic data, presenting results as means with standard deviations or medians with interquartile ranges, as appropriate. The relationship between grit and burnout was examined using Pearson's correlation coefficient. A logistic regression analysis was conducted to identify factors associated with burnout. Statistical significance was set at $p < 0.05$ for all analyses.

RESULTS

A total of 106 clinical students responded to the survey, representing 100% of the sample (Table 1).

Demographic data indicated that 57.5% of the respondents were female medical students. The distribution of students was uniform for each academic year. 70.8% achieved a grade point average (GPAX) of 3.00. 86.8% reported that they had autonomously chosen to pursue medical studies. Among the participants, 67.9% were currently working in high-demand wards (obstetrics and gynecology, surgery, internal medicine, and pediatrics), wards where clinical medical students carry heavier responsibilities, collaborate closely with multiple levels of healthcare professionals, and undertake overnight on-call duties. In contrast, 32.1% were placed in low-demand wards (Eye, ENT, and Psychiatry), with fewer responsibilities, reduced workplace stress, and no overnight on-call shifts. More than half of the medical students (52.8%) met the criteria for burnout syndrome.

Table 2 shows that the average total grit score was 25.35±4.05. Most of the students (57.6%) scored in the moderate range, 23.6% in the low range, and 18.9% in the high range. When examining each domain, more than half of the clinical medical students exhibited moderate levels of passion and perseverance.

TABLE 1. Baseline characteristics of clinical medical students (N=106).

Demographic Characteristics	Descriptive Results
Gender	
Male	45(42.5)
Female	61(57.5)
Year-level of clinical medical students	
4th-year medical students	36(34.0)
5th-year medical students	35(33.0)
6th-year medical students	35(33.0)
GPAX	
<3.00	31(29.2)
≥3.00	75(70.8)
Intention to pursue medicine	
No	14(13.2)
Yes	92(86.8)
Current ward responsibilities	
High-demand wards	72(67.9)
Low-demand wards	34(32.1)
Burnout syndrome	
No	50(47.2)
Yes	56(52.8)

GPAX=cumulative grade point average
Data presented as numbers (percentages)

TABLE 2. Grit of clinical medical students (N= 106).

Grit domains	Low level	Moderate level	High level	Average score[a]
Passion	23(21.7)	58(54.7)	25(23.6)	12.51±2.69
Perseverance	16(15.1)	68(64.2)	22(20.8)	12.81±2.58
Total Grit	25(23.6)	61(57.6)	20(18.9)	25.35±4.05

Data are presented as numbers (percentages), aData are presented as mean ± standard deviation.

Table 3 presents the burnout levels of the clinical medical students at Chonburi Hospital. The results indicate high levels of negative aspects, with emotional exhaustion being the most prevalent in 44.3% of students who reported high levels. Depersonalization was also significant, with 32.1% of the students reporting high levels. On a positive note, most of the students (96.2%) reported high levels of personal accomplishment.

Table 4 illustrates the relationship between grit and burnout among clinical medical students. The total grit score showed a negative correlation with emotional exhaustion (r = -0.225, p = 0.021) and a positive correlation with personal accomplishment (r = 0.247, p = 0.011). Similarly, the perseverance domain of grit had a negative correlation with emotional exhaustion (r = -0.276, p = 0.004) and a positive correlation with personal accomplishment (r = 0.287, p = 0.003).

Table 5 presents the factors influencing academic burnout using regression analysis. The results showed that students currently working on the main patient wards were 3.2 times more likely to experience burnout than those working on the low-demand wards, with an adjusted odds ratio (AOR) of 3.189 (95% confidence interval [CI]: 1.288, 7.897; p=0.012). Additionally, medical students with low levels of total grit are 7.1 times more likely to experience burnout compared to those with moderate and high levels of perseverance, with an AOR of 7.147 (95% CI: 1.311, 38.964; p=0.023). Both findings were statistically significant.

DISCUSSION

The findings revealed a high prevalence of burnout, with 52.8% of the students meeting the criteria for burnout syndrome. This rate is consistent with previous research that showing similar levels of burnout among medical students worldwide.[3] Emotional exhaustion and depersonalization were common, affecting 44.3% and 32.1% of students, respectively. These findings align with the Thamissarakul study (2024), which indicates that many clinical medical students are likely to experience higher levels of emotional exhaustion and depersonalization due to the increased workload compared to the preclinical

TABLE 3. Burnout symptoms of clinical medical students (N=106).

Burnout symptoms	Low level	Moderate level	High level	Average score[a]
Emotional exhaustion	22(20.6)	37(34.9)	47(44.3)	25(18, 31)
Depersonalization	37(34.9)	35(33.0)	34(32.1)	9(5, 14)
Personal accomplishment	1(0.9)	3(2.8)	102(96.2)	17(13, 24)

Data presented as numbers (percentages), Data presented as median ± IQR

TABLE 4. Pearson's correlations between Grit and Burnout symptoms.

	Total Grit	PS	PV	EE	DP	PA
Total Grit	1.000	0.726**	0.770**	-0.225*	0.149	0.247*
PS	1.000	0.188	-0.104	0.147	0.087	
PV	1.000	-0.276**	-0.055	0.287**		
EE	1.000	0.597**	0.077			
DP	1.000	0.038				
PA	1.000					

Abbreviations: PS, passion; PV, perseverance; EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment
*p<0.05, **p<0.01

TABLE 5. Factors Associated with Burnout Syndrome using logistic regression analysis.

Factors	Crude odd ratio (95% CI)	P-value	Adjusted odd ratio (95% CI)	*p*-value
Female	0.966(0.446, 2.089)	0.929	0.875(0.376, 2.034)	0.756
GPAX < 3.00	1.626(0.693, 3.815)	0.264	1.435(0.565, 3.645)	0.448
Intention to pursue medicine	0.400(0.117, 1.368)	0.144	0.370(0.098, 1.404)	0.144
High-demand ward	2.881(1.234, 6.727)	0.014*	3.189(1.288, 7.897)	0.012*
Low grit	2.288(0.888, 5.897)	0.087	7.147(1.311, 38.964)	0.023*

*$p<0.05$

level, along with the pressures of ward duties, exams, and expectations from other healthcare providers and supervisors.[1] However, personal accomplishments remained high, with 96.2% reporting high levels of achievement. This highlights the complex nature of burnout, where students may feel both exhausted and detached from their work, while still experiencing a sense of fulfillment from their accomplishments.[21,22]

To place our results in a more recent context, a systematic review by Di Vincenzo et al. (2024) reported that burnout prevalence among medical students can vary widely, ranging from 5.6% to as high as 88%.[4] While our observed prevalence of 52.8% among clinical medical students falls within this broad spectrum, it still highlights that burnout remains a substantial concern. Additionally, potential methodological issues in our study—such as the single-institution context, the relatively small sample size, and possible selection bias—may have influenced our results. Future research should consider larger, multi-institutional samples to enhance the generalizability and accuracy of prevalence estimates.

One of the key findings of this study is the significant relationship between grit and burnout. Grit, especially perseverance, was negatively correlated with emotional exhaustion, indicating that students with higher levels of perseverance are better able to cope with the stresses of medical training. This is consistent with prior studies demonstrating that grit plays a protective role in high-pressure environments by fostering resilience.[10,23] Furthermore, the positive correlation between grit and personal accomplishment suggests that students with higher levels of grit not only experience less emotional exhaustion, but also feel a stronger sense of achievement in their work.[9,11] This underlines the potential role of grit in mitigating some of the negative impacts of burnout.

These findings are in line with more recent studies involving medical students. For example, Lee et al. (2023) demonstrated an inverse association between grit and burnout, indicating that students with higher grit levels tend to report lower burnout symptoms.[18] Similarly, Jumat et al. (2020) found that students with higher grit had a lower likelihood of experiencing burnout, with an odds ratio of 0.84 (95% CI: 0.74–0.96), and an area under the ROC curve of 0.76 (95% CI: 0.62–0.89) when using grit as a single predictor of burnout.[17] Although our study's context differs (e.g., geographic location, clinical environment), the converging evidence suggests a consistent protective effect of grit against burnout in medical trainees.

Furthermore, multivariate logistic regression analysis indicated that low levels of grit were strongly associated with burnout. This suggests that grit can serve as a protective factor, reducing the likelihood of burnout in medical students. This finding aligns with recent studies in medical education that highlight the importance of noncognitive traits, such as grit, in predicting well-being and success in stressful settings.[15,24] Therefore, interventions that cultivate grit in medical students could be valuable in preventing burnout.

In addition, this study also found that students assigned to high-demand ward responsibilities were significantly more likely to experience burnout compared to those with low-demand ward duties. This finding is consistent with previous studies in Thailand, where clinical rotations on high-demand wards are associated with elevated stress levels.[5,6] These results emphasize the

need for targeted interventions for students in these intensive training environments. Fostering resilience and perseverance through grit-enhancing programs may help students manage the pressures of ward duties and reduce the risk of burnout.[12,25]

Interestingly, unlike some previous reports,[1,2,8,26] we did not find significant associations between burnout and variables such as gender or year of study. While some studies suggest that these demographic factors influence burnout risk[1-4,8], our findings differ. This discrepancy may reflect variations in sample size, institutional culture, or educational policies that influence how stressors are distributed or perceived. Beyond demographic and institutional differences, broader educational contexts, such as the frequency and nature of examinations, the availability of mental health support services, the structure of advisory and mentorship systems, and the provision of scholarships or financial assistance, may all contribute to how clinical stressors are experienced.[5,14] These factors could shape students' resilience and coping mechanisms, thereby influencing the prevalence and severity of burnout. Future research should explore why these differences occur—whether they are due to local conditions, unique support structures, or other moderating factors.

While this study provides valuable insights, it has some limitations. Being cross-sectional, it does not allow for the determination of causal relationships. Future longitudinal studies are needed to assess how grit influences the development of burnout over time. Additionally, the small sample size limits the generalizability and statistical power of our findings. Expanding the sample and including multiple institutions could provide a more comprehensive understanding of the relationships between grit, burnout, and contextual factors among clinical medical students.

This study utilized the validated Thai version of the Maslach Burnout Inventory-General Survey (MBI-GS), which is based on the 1989 edition of the MBI Manual. While this version is widely accepted and has been used extensively in Thai research, we acknowledge that the MBI Manual has undergone updates, with the latest being the 4th Edition (1996–2018).[27] These updates may include refinements in scoring or interpretation that were not incorporated into the Thai version. Future studies may consider adapting or validating the most recent version of the MBI for the Thai context to align with the latest international standards.

CONCLUSION

Higher grit, particularly perseverance, is associated with lower emotional exhaustion and greater personal accomplishment, suggesting that grit serves as a protective factor against burnout among clinical medical students. Despite this potential buffering effect, burnout is still prevalent in this population, especially among students with high-demand ward responsibilities and those exhibiting low grit levels. These findings underscore the importance of interventions aimed at enhancing grit as a strategy to mitigate burnout and improve the well-being of medical trainees.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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DECLARATION

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No funding was provided by any institutions or individuals for this study.

Conflict of Interest

The authors declare no conflict of interests.

Author Contributions

Conceptualization and methodology, N.T., S.T., and P.W. ; Investigation, N.T., and S.T.; Formal analysis, N.T. and S.T. ; Visualization and writing – original draft, N.T., and S.T. ; Writing – review and editing, P.W.; Supervision, P.W. All authors have read and agreed to the final version of the manuscript.

Use of Artificial Intelligence

Not applicable

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