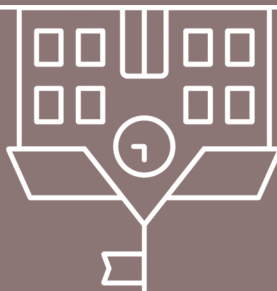


ALLEVIATING BURNOUT IN MEDICAL SCHOOL:
INCREASING A SENSE OF
BELONGING AND COLLEGIACITY
IN THE CLINICAL WORKPLACE

PONGTONG PURANITEE



Alleviating burnout in medical school:

increasing a sense of belonging and collegiality
in the clinical workplace

The research reported here was carried out at Maastricht University | Maastricht UMC+



In the school of Health Professions Education



in the context of the research school (Interuniversity Center for Educational Research)

Alleviating burnout in medical school: increasing a sense of belonging and collegiality in the clinical workplace.

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Alleviating burnout in medical school: increasing a sense of belonging and collegiality in the clinical workplace

DISSERTATION

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Chapter 1

General introduction and
scope of the dissertation

General introduction

As defined by Maslach¹, burnout is a psychological condition in response to chronic interpersonal stressors related to work and includes three key subdimension: high emotional exhaustion, high depersonalization, and lack of professional efficacy. Burnout has been originally identified and discussed as a phenomenon unique to the human service sector, particularly in health care, education, social work, psychotherapy, legal services, and law enforcement.² However, in 2019, the World Health Organization re-defined burnout from a health point of view as a syndrome caused by chronic and poorly managed workplace stress.³

This syndrome is marked by 1) high emotional exhaustion or feelings of energy depletion, 2) high depersonalization or cynicism about one's job, and 3) a lack of personal accomplishment or perception of low professional efficacy.³

Burnout is nowadays an epidemic (psychological and societal) occurring across occupations. In healthcare, the demanding practice of training and working in healthcare settings with inadequate support often leads to chronic stress and burnout among physicians as well as among medical students and medical professionals.

Burnout may originate as early as in medical school among medical students.⁴⁻⁵

Burnout measurement

Various instruments are available to measure burnout, such as the Copenhagen Burnout Inventory⁶, the Hamburg Burnout Inventory⁷, and the Pines and Aronson Burnout measurement.⁸ However, the MBI is the only burnout measurement tool that aligns with the World Health Organization's 2019 definition of burnout. The Maslach Burnout Inventory (MBI) is a self-assessment questionnaire that has been the leading measure of burnout in individuals for more than a decade. The MBI has five versions: Human Services survey (MBI-HSS), General survey (MBI-GS), General Survey for Students (MBI-SS), Educator's survey (MBI-ES) and Medical Personnel (MBI-HSS (MP)).⁹ The MBI-HSS and MBI-SS questionnaires are validated tools and used in this thesis. (Details in the table regarding the thesis outline are provided below).

The MBI-HSS is a standard 22-item questionnaire (7-point Likert scale). The instrument consists of three sections that measure levels of a) emotional exhaustion, b) depersonalization, and c) personal accomplishment. It can be used among postgraduate medical trainees and physicians. The internal reliability of the MBI-HSS, using Cronbach's coefficient alpha, yielded estimates of 0.90 for Emotional Exhaustion, 0.79 for Depersonalization, and 0.71 for Personal Accomplishment.⁹ The MBI-HSS has previously been translated into Thai and tested for reliability. Cronbach's alpha coefficients for the sections were 0.92, 0.66, and 0.65, respectively.¹⁰ According to the literature in non-clinical situations, a Cronbach's coefficient alpha value range of over

0.60-0.70 was considered satisfactory.¹¹ Thus, the MBI-HSS Thai version can be used among Thai postgraduate medical students trainees and physicians.

Among the higher education students, the MBI-SS was adapted from the MBI-GS to fit with students' context. The MBI-SS, used to diagnose burnout among university students in general, has also been reported to be a useful alternative for the MBI-HSS to assess medical student burnout.¹² The Maslach Burnout Inventory-general survey for students (MBI-SS) is a standard 16-item questionnaire rated by a 7-point Likert scale. The psychometric properties of the MBI-SS were shown to have adequate validity and reliability in Spain, Portugal, The Netherlands, Brazil, Italy, and France.¹³⁻¹⁶ Among non-Western countries, the MBI-SS is found to have acceptable psychometric properties in Serbia, Turkey (high school students), Iran, and South Korea.¹⁷⁻²¹ However, the Japanese version of the MBI-SS needed minor changes to improve the fit of its three-factor model, and the Chinese version demonstrated a low internal consistency.²²⁻²³ Thus, the MBI-SS of some non-Western countries needed some adaptation of items to improve its validity and reliability. This may also apply to Thailand. The Thai culture may contrast with most Western countries and even with the culture in some non-Western countries. The psychometric properties of the Thai version have so far not been documented. As a result, a validation study of the MBI-SS Thai version is needed, especially for the Asian population.

Overall prevalence of burnout

Due to the multifaceted causes of burnout, the different definitions of burnout, and the subjectivity of the defined criteria, the prevalence of burnout is erroneously and unclearly summarized.²⁴ Therefore, the reported prevalence of burnout varies internationally. For instance, a distinction can be seen between European Union countries (10%) and non-European Union countries (17%). The incidence of burnout varies from 4.3% in Finland to 20.6% in Slovenia within the European Union and from 13% in Albania to 25% in Turkey outside the European Union.²⁵ This study also found that country-specific burnout levels positively correlate with the workload. A Finnish study on burnout and socio-demographic characteristics found small differences between population groupings. Age and gender-specific factors increased occurrence.²⁶ These might also be the factors that contribute to the observed variation in the prevalence of burnout across the country.

Among physicians, the prevalence of burnout was substantially variable, ranging from 0% to 80.5%. This was likewise due to the marked variation in burnout definitions, assessment methods, and study quality.²⁷ Burnout is not only common among physicians. Numerous studies also identified that residents and medical students likewise experience burnout.²⁸⁻³¹ In the U.S., the prevalence of burnout among residents was high and varied between subspecialties. For example, a study in 2008 showed that 74% of pediatric residents from three programs met the criteria of burnout using the MBI-HSS.³² In 2001-2003, a study among internal medicine residents reported a

prevalence of emotional exhaustion of 40–53%.³³ Interestingly, a national survey of U.S. medical students, residents/fellows, and early career physicians (<5 years after graduation) demonstrated a prevalence of burnout of 55.9% among medical students, 60.3% among residents/fellows, and 51.4% for early career physicians. Also, when compared with a probability-based sample of the general U.S. population, medical students, residents/fellows, and EC physicians were more likely to be burned out (all $p < .0001$).³⁴

Among medical students, the reported prevalence of burnout ranged from 45–71%.⁴ In 2006, 45% of US medical students reported burnout in a multicentre study³⁵, and in 2012 Chang et al. reported 55% burnout among the first three years of medical students in the US.³⁶ A study conducted in 2016 in Trinidad and Tobago demonstrated a significant prevalence of burnout (52 %) among medical students.³⁷ A different study in Lebanon measured burnout risk in preclinical medical students in 2011. It showed that 75% of them suffered from burnout.³⁸ Another study from Spain in 2011 showed that 14.8% experienced burnout.³⁹ Again, these studies show that the number of medical students who suffer from burnout varies from country to country.

Many of the studies mentioned above were performed in the context of Western countries. Burnout, however, is most likely a cross-cultural problem. In Thailand, burnout is also a reported problem. In 2014, Srikam et al. (2014) evaluated the level of burnout among residents at King Chulalongkorn Memorial Hospital, Bangkok. The results revealed that 38.8%, 52.8%, and 40% of residents respectively experienced emotional exhaustion, depersonalization, reduced personal accomplishment. In this study, factors contributing to burnout were medium/high family burden, the first year in residency training, major wards, too much paperwork, short sleeping hours, and job dissatisfaction.¹⁰

What are the differences in adverse effects of burnout between physicians, residents, and students?

Physician burnout is associated with alcohol abuse and dependence⁴⁰, depression and suicidal ideation⁴¹, major medical error⁴², malpractice suit⁴³, reduced empathy⁴⁴, suboptimal patient care⁴⁵, and decreased productivity.⁴⁶

Among residents, burnout has been linked to residents' self-reported suboptimal patient care practices⁴⁷ and malpractice.⁴⁸ Among medical students, burnout was associated with lower quality of life, academic motivation and achievement⁴⁹, higher self-reported unprofessional conduct, and less altruistic professional values.⁵⁰

Furthermore, burnout in medical students has associated factors such as personal life factors, workplace or learning environment, minority status, and psychiatric problems.⁴

In conclusion, burnout is a significant and relevant problem on all levels of the educational continuum: medical students and physicians. It necessitates interventions to prevent adverse effects, and preferably initiated early in medical school.

Theoretical framework: the job demands-resources model

Job demands refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are related to specific physiological and/or psychological costs.⁵¹ Job resources refer to physical, psychological, social, or organizational aspects of the job, that are functional in achieving work goals; reduce job demands and the related physiological and psychological costs; or stimulate individual growth, learning, and development.⁵²⁻⁵⁴ Resources can be personal or related to the job, like social support from coworkers and trainers, feedback on performance, and the freedom to make decisions. These factors may contribute to a motivational process that leads to engagement at work and, in turn, higher performance. These studies pointed to the job demands-resources model (JD-R model) as the theoretical framework of this research proposal (see Figure 1.1).

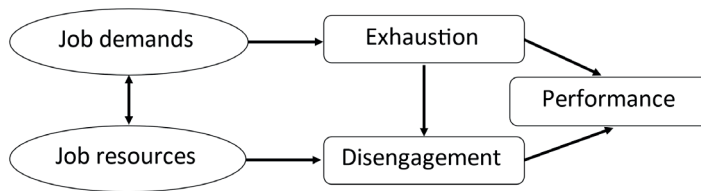


Figure 1.1 The job demands-resources model.

A multicenter study by Dyrbye et al. (2009) found that job demands such as being on a hospital ward rotation or a rotation requiring overnight shifts were associated with medical student burnout and decreased learning satisfaction and were, therefore, crucial to student well-being.⁵⁵ In addition, a survey study on burnout and self-reported mistreatment (psychological demand related to work) among 3rd-year medical students by Cook et al. (2014) found that recurrent mistreatment by faculty and residents was associated with medical student burnout.⁵⁶ Therefore, the interaction between medical students and residents or faculty plays a vital role in relation to medical students' well-being and burnout as one of the job resources in the JD-R model (Figure 1.1). In addition, the relationship between medical students and other persons in their learning environment is crucial to investigate.

Strategies proposed to alleviate burnout

The effectiveness of interventions to reduce burnout (emotional exhaustion level) in physicians in randomized clinical trials and controlled before-after studies in physicians, including residents and fellows, has been investigated. The interventions applied can be categorized into organization-directed and physician-directed interventions. The results indicated that organization-directed interventions significantly positively reduced burnout compared to physician-directed interventions.⁵⁷ Therefore, burnout should be

viewed as a whole healthcare organization's concern rather than merely an individual's concern. The effects of both interventions, however, were relatively small.

Among medical students, the efficacy of interventions was also reviewed in separate studies with different study designs. Self-development groups (led by a psychiatrist trained in group analytical therapy), the Respiratory One Method for relaxation (relaxation and mediation technique by verbalizing the word "one" on exhalation), and a pass-fail grading system (instead of a letter grading system) appeared to reduce burnout among medical students.⁵⁸ Nevertheless, these studies suggested that more research on preventive measures regarding burnout, focusing on earlier phases of education, including the undergraduate level, is needed. Therefore, the need to study innovative interventions to alleviate burnout in medical education and focus on the earlier phases of education, the undergraduate level, is crucial. As far as we know however, no research has been done on how to prevent burnout in Thailand.¹⁰

Work engagement is a positive antithesis to burnout¹³, and interventions therein may be an alternative route regarding burnout prevention. Work engagement is characterized by vigor, dedication, and absorption^{13,58} confirming the hypothesized job demands and resources model. Thus, burnout and engagement are negatively related. Also, burnout is mainly predicted by job demands and the lack of job resources, whereas the availability of job resources exclusively predicts engagement. Finally, Demerouti et al. (2001) found that job demands were primarily related to exhaustion, and a lack of resources were associated with disengagement.⁵¹ Therefore, any intervention that increases resources may also have the potential to strike a balance between job demand and resources and alleviate burnout.

Novel burnout prevention strategy: promoting social resilience

A relatively new strategy proposed to reduce and prevent burnout is by promoting resilience in the workplace, in the setting of undergraduate and postgraduate medical trainees and physicians alike.⁵⁹ Resilience is the ability to bounce back when a person meets adversity. Social resilience is the "ability of a group to tolerate stress in an adaptive manner through mutual trust and bonding among its members" and was proposed to be the key to promoting wellbeing in the workplace instead of strategies to improve life outside the workplace. The road map to creating social resilience should be prioritized to connect colleagues in the workplace (collegiality) and promote self-actualization. Given their academic activities, postgraduate and undergraduate medical students have a shared but also different working and learning environment. The learning environment of medical students consists of the social, psychological, and physical contexts that influence or are influenced by academic activities, as well as the perceived support structures available to students, their level of autonomy for learning, their emotional response, and the inherent meaning they find in the educational

process.⁶⁰ Therefore, the strategy of promoting resilience to prevent burnout should be explored in the learning environment of undergraduate medical students as well as postgraduate medical trainees who shared working and learning environment. Apart from promoting resilience, other strategies for burnout prevention can be envisioned. One of the potentially influential factors regarding burnout is sense of belonging and collegiality. These factors will be discussed in the next paragraph.

Hierarchy of needs toward self-actualization theory

From Marlow Maslow's 1971 so-called Hierarchy of Needs toward self-actualization theory, a sense of belonging is the critical step to self-actualization achievement.⁶¹ A sense of belonging is experienced when persons become involved in a system or environment so that persons perceive themselves to be an integral part of that system or environment. A sense of belonging consists of a perception of being valued for involvement, feeling accepted, needed, and accepted, and a perception of a fit of the individual characteristics with the system or environment.⁶² The relationship between sense of belonging and burnout among medical students has not been studied.

Collegiality

Collegiality is another crucial aspect of medical professionalism. Promoting collegiality can enhance leadership and teamwork, and collaboration can foster trainees' learning. For example, physicians in group practices performed better in maintenance of certification examinations than those in solo practices.⁶³ Alternatively, solo practitioners with high peer interaction performed as well as those in group practice. Therefore, peer interaction is essential for professional learning and quality of care. A different study on the collegial environment among nurses found an association of collegiality with communication breakdown, lack of nurse retention, and loss of respect and civility.⁶⁴ However, there is a need to get insight in the perception of faculty members on their actions and zone of influence on opportunities to support collegiality to alleviate burnout.

In summary: Based on the JD-R theory and Maslow's Hierarchy of Needs toward self-actualization theory, a sense of belonging and collegiality are part of job resources contributory to wellbeing. Therefore, promoting a sense of belonging and teamwork could theoretically be a good fit with job redesign in the JD-R intervention, as shown in table 1 of the JD-R model. However, studies on new strategies to promote a sense of belonging and collegiality are needed to study whether these interventions contribute to alleviating burnout in medical students and postgraduate trainees.

Role of medical education in burnout (and its prevention)

It has been suggested that the way medical schools train physicians may also have negative effects on trainees' experiences of stress and well-being.⁶⁵ For example, a

curriculum that focuses heavily on technical abilities but lacks emphasis on understanding social interactions with patients and coworkers and collaboration in teams within a hospital is more likely to cause stress and a decreased sense of well-being. Hence, to alleviate burnout in medical education, Maslach recommended that medical educators address the problem of burnout by raising awareness among medical students about their burnout, making them aware of the burnout problem, enhancing teamwork perspective, and building a culture of appreciation by mentors and instructors.⁶⁶ They should also model appreciation and acknowledgment during training and establish it as an ongoing habit. Therefore, the faculty plays an essential role in burnout among medical students and future physicians. However there has been no study demonstrating evidence of whether their contribution alleviates burnout.

In conclusion, given the severity of the consequences of medical learners' burnout, it is essential to identify and gain a deeper understanding of the contributing factors to burnout to develop new strategies to prevent and alleviate burnout. The current interventions have had relatively small effects on reducing burnout. Therefore, alternative interventions that create a sense of belonging (valued and fit) and collegiality have been proposed as novel ways to overcome the disconnection between peers and other professionals in the clinical workplace, thereby potentially increasing work engagement and lowering the incidence of burnout. Exploring the conditions which promote the sense of belonging (valued and fit) and collegiality among undergraduate medical students from their perspectives, as well as from the faculty members' perspective, is thus essential to guide the design of new interventions to alleviate burnout in medical school.

Aims and outline of the dissertation

The studies presented in this dissertation aim to advance our insight into the prevalence of burnout and factors in the learning environment related to burnout in a non-Western Asian context, both in postgraduate and undergraduate medical education and from students and faculty members' perspectives. The dissertation adds to the extensive theoretical literature about factors related to burnout and shows evidence of the potential consequences of burnout in both postgraduate and undergraduate medical education. Moreover, this dissertation proposed strategies to alleviate burnout in medical school through increasing the sense of belonging, collegiality, and engagement in medical school from the insight of undergraduate medical students and faculty members.

Research questions

The following research questions are addressed in this dissertation:

Research question 1

To what extent do pediatric residents in a non-Western setting experience burnout? And what is the relation between burnout and personal characteristics of residents' learning environment and work-related quality of life (Chapter 2)?

Research question 2

What are the psychometric properties of the Thai version of the Maslach Burnout Inventory-general survey for students (MBI-SS) and the sense of belonging survey in undergraduate medical students (instruments that will be used in the subsequent studies) (Chapter 3)?

Research question 3

To what extent is burnout related to a sense of belonging (relatedness with others) and work engagement for undergraduate medical students (Chapter 4)?

Research question 4

What key elements do undergraduate medical students perceive as positively or negatively contributing to promoting collegiality, engagement, and a sense of belonging (Chapter 4)?

Research question 5

What are the relationships between burnout and mistreatment, including the prevalence, recurrence, categories, reporting actions, mistreated persons, related

behavior, and well-being of medical students in non-Western Asian contexts (Chapter 6)?

Research question 6

What do faculty members perceive are the most important things that affect (both positively and negatively) an undergraduate medical student's sense of belonging, engagement, and collegiality (Chapter 5)?

Outline of the thesis

The following research questions are addressed in this dissertation:

Chapter	Research questions	Methods	Participants	Discussion
2	To what extent do pediatric residents in a non-Western setting experience burnout? And what is the relation between burnout and personal characteristics of residents' learning environment and work-related quality of life, as well as factors that inhibit and promote burnout among residents?	An exploratory sequential mixed methods design was employed in a cross-sectional study. Survey: Maslach Burnout Inventory-Health service survey (MBI-HSS), the Postgraduate Hospital Educational Environmental Measure (PHEEM), and Work-Related Quality of Life scale (WRQoL). Semi-structured individual interview	Post-graduate pediatric residents	The main factors related to burnout in Western countries were job satisfaction, stress at work, control at work, and the educational climate. However, as far as we know, factors related to pediatric residents' burnout, especially regarding educational climate and work quality of life, have not yet been studied in non-Western contexts.
3	What are the psychometric properties of the Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS), and is the occurrence of burnout and its subscales potentially correlated with depression, years of training, gender, and grade point average (GPA) among Thai undergraduate medical students?	A cross-sectional study with psychometric properties testing for the Maslach Burnout Inventory-general survey for students (MBI-SS) Occurrence of burnout correlation between burnout, the risk for depression, years of training, gender, and grade point average (GPA)	Undergraduate medical students	The Thai culture may contrast with most Western countries and even with the culture in some non-Western countries. Studies in Thailand have so far focused on residents, not on undergraduate medical students. Moreover, a Thai version of the MBI-SS is lacking, and the validity of its psychometric properties has not been studied so far. A Thai version of the MBI-SS with sufficient psychometric properties would guarantee the accurate measurement of burnout among undergraduate medical students and improve the understanding of burnout in medical students in non-Western countries.

Chapter	Research Questions	Methods	Participants	Discussion
4	To what extent is burnout related to a sense of belonging (relatedness with others) and work engagement for undergraduate medical students?	<p>An exploratory sequential mixed-methods design</p> <p>The Basic Psychological Need Satisfaction at Work Scale (BPNSS-21) measured students' basic psychological needs satisfaction at work</p> <p>The Utrecht Work Engagement Scale-Student Version (UWESS-9) measured work engagement</p> <p>Factor analysis of the BPNSS-21 and UWESS-9</p> <p>Correlation between burnout, students' basic psychological needs satisfaction at work, and engagement</p>	Undergraduate medical students	key factors that promote a sense of belonging (being valued and perceived fit) and collegiality related to alleviating burnout are still poorly understood, especially from a non-Western, Asian medical students' perspective which was different from Western.
4	What key elements do undergraduate medical students perceive as positively or negatively contributing to promoting collegiality, engagement, and a sense of belonging?	<p>An exploratory study using semi-structured individual interviews</p>	Undergraduate medical students	Exploring the key elements positively or negatively contribute to promoting collegiality, engagement, and a sense of belonging among undergraduate medical students is essential to guide the design of new interventions to alleviate burnout in medical schools in non-Western Asian contexts.

Chapter	Research questions	Methods	Participants	Discussion
5	What are the relationships between burnout and mistreatment, including the prevalence, recurrence, categories, reporting actions, mistreated persons, related behavior and well-being of medical students in non-Western, Asian contexts?	A cross-sectional survey study using Thai version of the Clinical Workplace Learning Negative Acts Questionnaire—Revised (NAQ-R) (forward-back translation process with quality analysis). Thai Maslach Burnout Inventory-Student Survey Thai Patient Health Questionnaire (to assess depression risk) demographic information, mistreatment characteristics, mistreatment reports, related factors, and consequences	Undergraduate medical students	Mistreated students had unpleasant feelings and burnout. However, a study on prevalence, the relationship between mistreatment, well-being and unprofessional behavior, and reporting behavior in a non-Western, Asian context was limited.
6	What do faculty members perceive are the most important things that affect (both positively and negatively) an undergraduate medical student's sense of belonging, engagement, and collegiality	An exploratory qualitative study design semi-structured individual interviews	Faculty members in undergraduate education	Faculty members are a crucial part of the learning environment and program design, enhancing a sense of belonging, engagement, and collegiality. However, studies exploring faculty members' perspectives regarding strategies to enhance a sense of belonging, engagement, and collegiality were limited.

Reflexivity

For the studies in this thesis, I had the position of a researcher and the potential influence introduced in collecting, analyzing, and interpreting the data. In addition, I have a background in health profession education science and am a medical teacher of both postgraduate and undergraduate medical students. Finally, the context of medical students and faculty members is familiar to me.

During the study period of undergraduate medical students, I was not involved in teaching or assessing the students during this study period. Therefore, the power differential in the relationship between teacher and student was limited. However, in the study among pediatric residents (postgraduate medical trainees), I was involved in teaching but not assessing residents during the study period. There might be some degree of power difference and influence on participants regarding the individual interview part.

Lastly, in the study in which explored faculty members' perspectives about how to promote an undergraduate medical student's sense of belonging, engagement, and collegiality, my role was a current medical teacher. This could help me understand the participants' context and support me in deeply interviewing and revealing the participants' experiences and perspectives. I have no influence or power over other faculty members. In the study among postgraduate medical trainees, I was, however, teaching the participants at that time. Therefore, the relationship between researchers and participants requires consideration. Although participants were informed that the data was confidential, they might be uncomfortable disclosing negative information or may have given socially and culturally desirable answers.

However, I was always conscious of potential bias and personal experiences as a researcher and the possible impact that may have had in collecting, analyzing, and interpreting the data. Therefore, we worked as a heterogeneous research team to minimize the burden of positionality. My co-researchers are medical educators with a background in health professions and education sciences and had no direct contact with the participants during the data collection period. Instead, they provided independent external medical education and research perspectives on the data and its interpretation. They reviewed examples and counter-examples, supported the thematic analysis, and participated in the scientific writing process to prevent tunnel vision or confirmation distortion. In addition to their medical education expertise, my co-researchers are also active physicians, enabling them to consider the study's results in the context of the (current) clinical environment.

References

1. Maslach C. Professional burnout: recent developments in theory and research. In: Maslach C, Schaufeli WB, Marek T, editors. *Burnout: a multidimensional perspective*. 6th ed. Washington, DC: Taylor & Francis; 1993:19–32.
2. Schaufeli WB. Burnout: A short socio-cultural history. In S. Neckel, A.K. Schaffner, & G. Wagner (Eds.), *Burnout, fatigue, exhaustion: An interdisciplinary perspective on a modern affliction* 2017:105–127. Palgrave Macmillan. https://doi.org/10.1007/978-3-319-52887-8_5
3. WHO International Classification of Diseases. 2019. https://www.who.int/mental_health/evidence/burn-out/en/ Accessed 2 Aug 2021.
4. Ishak W, Nikraves R, Lederer S, Perry R, Ogunyemi D, Bernstein C. Burnout in medical students: a systematic review. *Clin Teach*. 2013;10(4):242–5.
5. Chunming WM, Harrison R, MacIntyre R, Travaglia J, Balasooriya C. Burnout in medical students: a systematic review of experiences in Chinese medical schools. *BMC Med Educ*. 2017;17(1):1–11
6. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: a new tool for the assessment of burnout. *Work Stress*. 2005;19(3):192–207.
7. Burisch M. Approaches to personality inventory construction: a comparison of merits. *Am Psychol*. 1984;39(3):214–227.
8. Malakh-Pines A, Aronson E, Kafry D. *Burnout: From Tedium to Personal Growth*. New York, NY: Free Press; 1981.
9. Maslach C, Jackson SE, Leiter MP. *Maslach Burnout Inventory Manual Fourth Edition*. Published by Mind Garden, Inc. 2017:1–81.
10. Srikam S, Jiamjarasrangsri W, Lalitanantpong D. Job Burnout and Related Factors among Residents of King Chulalongkorn Memorial Hospital. *J Psychiatr Assoc Thailand*. 2014;59(2):139–150.
11. Bland J, Altman D. Statistics notes: Cronbach's alpha. *BMJ*. 1997;314:275.
12. Obregon M, Luo J, Shelton J. et al. Assessment of burnout in medical students using the Maslach Burnout Inventory-Student Survey: a cross-sectional data analysis. *BMC Med Educ* 2020;20:376 . <https://doi.org/10.1186/s12909-020-02274-3>
13. Schaufeli WB, Martinez IM, Pinto AM, Salanova M, Bakker AB. Burnout and Engagement in university students: A cross-Nation Study. *Journal of cross-cultural psychology*. 2002;3(5):464–448.
14. Campos JADB, Maroco J. Maslach burnout inventory — student survey: Portugal-Brazil cross-cultural adaptation. *Rev Saude Publica*. 2012;46:816–824.
15. Portoghese I, Leiter MP, Maslach C, Galletta M, Porru F, D'Aloja E, et al. Measuring burnout among university students: factorial validity, invariance, and latent profiles of the Italian version of the Maslach Burnout Inventory Student Survey (MBI-SS). *Front Psychol*. 2018;9:2105.
16. Faye-Dumanget C, Carré J, Le Borgne M, Boudoukha PAH. French validation of the Maslach Burnout Inventory-Student Survey (MBI-SS). *J Eval Clin Pract*. 2017;23(6):1247–1251.
17. Ilic M, Todorovic Z, Jovanovic M, Ilic I. Burnout syndrome among medical students at one university in Serbia: validity and reliability of the Maslach Burnout Inventory-Student Survey. *Behav Med*. 2017;43(4):323–328.
18. Kutsal D, Bilge F. A study on the burnout and social support levels of high school students. *Eğitim ve Bilim*. 2012;37(164):283–297.
19. Yavuz G, Dogan N. Maslach Burnout Inventory-Student Survey (MBI-SS): a validity study. *Procedia-Social and Behavioral Sciences*. 2014;116:2453–2457.
20. Rostami Z, Abedi MR, Schaufeli WB, Ahmadi SA, Sadeghi AH. The psychometric characteristics of Maslach Burnout Inventory Student Survey: a study of students of Isfahan University. *Zahedan Journal of Research in Medical Science*. 2014;16(9):55–58.
21. Shin H, Puig A, Lee J, Lee JH, Lee SM. Cultural validation of the Maslach burnout inventory for Korean students. *Asia Pacific Education Review*. 2011;12(4):633–639.
22. Tsubakita T, Shimazaki K. Constructing the Japanese version of the Maslach Burnout Inventory–Student Survey: confirmatory factor analysis. *Jpn J Nurs Sci*. 2016;13(1):183–188.

23. Hu Q, Schaufeli WB. The factorial validity of the Maslach Burnout Inventory-Student Survey in China. *Psychol Rep.* 2009;105(2):394–408
24. Lindblom KM, Linton SJ, Fedeli C, Bryngelsson IL. Burnout in the working population: relations to psychosocial work factors. *Int J Behav Med.* 2006;13:51–59.
25. Schaufeli WB 2018. Burnout in Europe: relations with national economy, governance, and culture. Research Unit Occupational & Organizational Psychology and Professional Learning (internal report). KU Leuven, Belgium.
26. Ahola K, Honkonen T, Isometsä E, et al. Burnout in the general population. Results from the Finnish Health 2000 Study. *Soc Psychiatry Psychiatr Epidemiol.* 2006;41:11–17.
27. Rotenstein LS, Torre M, Ramos MA, Rosales RC, Guille C, Sen S, Mata DA. Prevalence of Burnout Among Physicians: A Systematic Review. *JAMA.* 2018;320(11):1131–1150.
28. Fahrenkopf AM, Sectish TC, Barger LK, et al. Rates of medication errors among depressed and burnt out residents: prospective cohort study. *BMJ.* 2008;336(7642):488–491.
29. West CP, Shanafelt TD, Kolars JC. Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. *JAMA.* 2011;306:952–960.
30. Dyrbye LN, Massie FS Jr, Eacker A, et al. Relationship between burnout and professional conduct and attitudes among US medical students. *JAMA.* 2010;304:1173–1180.
31. Dyrbye LN, Thomas MR, Massie FS, et al. Burnout and suicidal ideation among U.S. medical students. *Ann Intern Med.* 2008;149:334–341.
32. Goitein L, Shanafelt TD, Wipf JE, Slatore CG, Back AL. The effects of work-hour limitations on resident wellbeing, patient care, and education in an internal medicine residency program. *Arch Intern Med.* 2005;165(22):2601–2606.
33. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med.* 2002;136(5):358–367.
34. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, Shanafelt TD. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Acad Med.* 2014;89(3):443–51.
35. Dyrbye LN, Thomas MR, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. Personal Life Events and Medical Student Burnout: A Multicenter Study. *Acad Med.* 2006;81(4):374–384.
36. Chang E, Eddins-Folensbee F, Coverdale J. Survey of the prevalence of burnout, stress, depression, and the use of supports by medical students at one school. *Acad Psychiatry.* 2012;36:177–182.
37. Youssef FF. Medical Student Stress, Burnout and Depression in Trinidad and Tobago. *Academic Psychiatry.* 2016;40(1):69–75.
38. Fridner A, Belkić K, Minucci D, Pavan L, Marini M, Pingel B, et al. Work environment and recent suicidal thoughts among male university hospital physicians in Sweden and Italy: the health and organization among university hospital physicians in Europe (HOUPE) study. *Gender Medicine.* 2011;8(4):269–279.
39. Galán F, Sanmartín A, Polo J, Giner L. Burnout risk in medical students in Spain using the Maslach Burnout Inventory-Student Survey. *Int Arch Occup Environ Health.* 2011;84:453–459.
40. Oreskovich MR, Shanafelt T, Dyrbye LN, Tan L, Sotile W, Satele D, et al. The prevalence of substance use disorders in American physicians. *The American Journal On Addictions.* 2015;24(1):30–8.
41. Shanafelt TD, Balch CM, Dyrbye L, Bechamps G, Russell T, Satele D, et al. Special report: suicidal ideation among American surgeons. *Arch Surg* 2011;146(1):54–62.
42. Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, et al. (2010). Burnout and medical errors among American surgeons. *Ann Surg.* 2010;251(6):995–100.
43. Balch CM, Oreskovich MR, Dyrbye LN, Colaiano JM, Satele DV, Sloan JA, Shanafelt TD. Personal Consequences of Malpractice Lawsuits on American Surgeons. *J Am Coll Surg.* 2011;213(5):657–667.
44. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, Shanafelt TD. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA.* 2006;296(9):1071–8.
45. Williams ES, Manwell LB, Konrad TR, Linzer M. The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: results from the MEMO study. *Health Care Management Review.* 2007;32(3):203–12.
46. Dewa C, Jacobs P, Thanh N, Loong D, Bonato S. How does burnout affect physician productivity? A systematic literature review. *BMC Health Services Research.* 2014;14(1):1–10.
47. Schaufeli WB, Salanova M, González-Roma V, Bakker AB. (2002). The measurement of engagement and burnout and: a confirmative analytic approach. *Journal of Happiness Studies.* 2022;3:71–92

48. Kwah J, Weintraub J, Fallar R, Ripp J. The Effect of Burnout on Medical Errors and Professionalism in First-Year Internal Medicine Residents. *Journal Of Graduate Medical Education*. 2016;8(4):597-600.
49. Lyndon MP, Henning MA, Alyami H, Krishna S, Zeng I, Yu TC, Hill AG. Burnout, quality of life, motivation, and academic achievement among medical students: A person-oriented approach. *Perspect Med Educ*. 2017;6(2):108-114.
50. Dyrbye LN, Massie FS. Jr, Eacker A, Harper W, Power D, Durning SJ, et al. Relationship between burnout and professional conduct and attitudes among US medical students. *JAMA*. 2010;304(11):1173-80.
51. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *Journal of Applied Psychology*. 2001;86:499–512.
52. Bakker AB. An evidence-based model of work engagement. *Current Directions in Psychological Science*. 2011;20(4):265-269.
53. Bakker AB, Demerouti E. The job demands-resources model: State of the art. *Journal of Managerial Psychology*. 2007;22(3):309-328.
54. Bakker AB, Demerouti E. *Job Demands–Resources Theory, Work and wellbeing (Vol. Vol. iii /, Wellbeing: a complete reference guide, volume ii)*. Chichester, West Sussex: John Wiley & Sons; 2014:1-24.
55. Dyrbye LN, Thomas MR, Harper W, Massie FS Jr, Power DV, Eacker A, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. The learning environment and medical student burnout: a multicentre study. *Med Educ*. 2009 Mar;43(3):274-282.
56. Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student mistreatment and its association with burnout. *Acad Med*. 2014;89(5):749-754.
57. Panagioti M, Panagopoulou E, Bower P, Lewith G, Kontopantelis E, Chew-Graham C, et al. Controlled Interventions to Reduce Burnout in Physicians: A Systematic Review and Meta-analysis. *JAMA Internal Medicine*. 2017;177(2):195-205.
58. Williams D., Tricomi G, Gupta J, Janise A. Efficacy of burnout interventions in the medical education pipeline. *Academic Psychiatry: The Journal Of The American Association Of Directors Of Psychiatric Residency Training And The Association For Academic Psychiatry*. 2015;39(1):47-54.
59. McKenna KM, Hashimoto DA, Maguire MS, Bynum WE. 4th. *The Missing Link: Connection Is the Key to Resilience in Medical Education*. Academic
60. *Medicine: Journal Of The Association Of American Medical Colleges*, 2016;91(9):1197-1199.
61. Marshall RE. Measuring the medical school learning environment. *J Med Educ*. 1978;53:98104.
62. Maslow AH. (1943) *A Theory of Human Motivation*. In R. J. Lowry *Dominance, Self-Esteem, Self-Actualization: Germinal Papers of A.H. Maslow*. Belmont, California: Wadsworth Publishing Company, Inc. 1973:153-173.
63. Schaufeli W., Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*. 2004;25(3):293-315.
64. Hagerty BM, Lynch-Sauer J, Patusky KL, Bouwsema M, Collier P. Sense of belonging: a vital mental health concept. *Archives Of Psychiatric Nursing*. 1992;6(3):172-177.
65. Valentine MA, Barsade S, Edmondson AC, Gal A, Rhodes R. Informal Peer Interaction and Practice Type as Predictors of Physician Performance on Maintenance of Certification Examinations. *JAMA Surgery*. 2014;149(6): 597.
66. Montgomery A. The Inevitability of physician burnout: implications for interventions. *Burnout Res*. 2014;1:50–6.

Chapter 2

Exploring burnout and the association with the educational climate in pediatric residents in Thailand

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Abstract

Background

This study, undertaken in Bangkok, Thailand, explored the extent to which pediatric residents in a non-Western setting experienced burnout and the potential association with factors in the medical educational climate and work-related quality of life.

Methods

An exploratory sequential mixed methods design was employed in a cross-sectional study. The initial, quantitative phase used the validated Maslach Burnout Inventory, the Postgraduate Hospital Educational Environmental Measure (PHEEM) and Work-Related Quality of Life scale (WRQoL). Regression analysis was used to identify the correlation between burnout and educational climate. Thereafter, residents in all years with high levels of burnout on subscales were interviewed individually.

Results

Forty-one pediatric residents completed the three questionnaires. None had high levels related to burnout in *all three* domains (emotional exhaustion, high level of depersonalization and perceived low personal accomplishment), seven (17%) showed high levels in two out of three domains. Emotional exhaustion and educational climate (perceptions of role autonomy, perceptions of teaching, perceptions of social support) were correlated with work-related quality of life. In the interviews, the main themes related to burnout were inappropriate tasks, teachers and teaching styles, the perception of knowledge insecurity relating to task performance, time dimensions, life crisis during training, role expectations and work allocation clarity, and facilities such as accommodation.

Conclusions

The study, in a non-Western setting, demonstrated a positive relation between educational climate and work-related quality of life. To help reduce the risk of burnout, the following factors were identified: minimize unnecessary or duplicated workload, schedule time arrangements to avoid extension of regular duty hours, and clearly define role expectations. The impact of inappropriate tasks, teachers and teaching styles (including unsafe environment) on the incidence of burnout was also highlighted. Additional studies focusing on teaching styles, safe learning climate and mistreatment in a non-Western context are needed.

Background

Burnout is a psychological condition presenting a response to chronic interpersonal stressors on the job. Burnout, as defined by Maslach (1993), is a triad of high exhaustion, high depersonalization and lack of personal accomplishment.¹ Research among physicians revealed differences in burnout prevalence across (sub) specialties. A periodic survey of American Academy of Pediatrics (AAP) members (n=1616; response rate 63%), showed that 22% of the respondents indicated to be experiencing burnout, while 45% had experienced burnout in the past.² From 2011 to 2014, general pediatrics in U.S. was found to be one of the ten subspecialties that experienced a more than 10% increase in burnout (35% vs. 46%).³ Burnout, highly prevalent among pediatricians, has been identified as a problem among pediatric residents and could ultimately have consequences for patient care. A study among 258 pediatric residents of 11 New England Pediatric Residency Consortium programs in U.S. revealed that residents experiencing burnout had significantly greater odds of displaying suboptimal patient care attitudes and behaviors, leading to maltreatment or medical errors, or ignoring the social impact of illness.⁴

High levels of burnout amongst residents across cultures and countries have uniformly been described, although some differences between countries can be observed. In Brazil, 53% of pediatric residents experienced burnout⁵, a percentage similar reported in a survey in Canada, where Nolan et al. found 42% of pediatric residents met criteria of burnout.⁶ In North America, Simpkin et al. reported that 31% of pediatric residents had burnout and determined high levels of stress from uncertainty and low levels of resilience as factors strongly related to burnout.⁷ A longitudinal prospective study of pediatric residents in North America showed that the prevalence of burnout increased from 2 to 24% between the start of residency and mid-intern year, without significant change over a 2-year period.⁸ In the U.S., Olson et al. showed that approximately 40% of first year pediatric residents experienced burnout. Self-compassion and mindfulness were factors inversely associated with burnout.⁹ In summary, the prevalence of burnout among residents thus varies across countries and factors related to it might at least partly originate from the workplace.

Work-related quality of life is more or less similar to employee well-being and includes work-based factors such as job satisfaction, as well as broader non-work factors such as general life satisfaction, feelings of well-being¹⁰ and work-related stress.^{11,12} A study done in the U.S., showed that factors contributing to first year pediatric resident burnout included time demands, lack of control, difficulties in work planning and work organization, difficult job situations and interpersonal relationship problems.¹⁰ A separate study on burnout, showed a negative correlation between job satisfaction and burnout levels among Turkish pediatric residents.¹³ In summary, factors such as job satisfaction, stress and control at work, working condition, home-work interface have been associated with the incidence of burnout in pediatric residents in Western countries.¹⁰⁻¹³ In non-Western countries such as Japan for example, factors contributing

to burnout include high workload, stress intolerance, interpersonal difficulties, and generation gaps regarding work-life balance.¹⁴ In Thailand, Srikamet et al. conducted a survey on job burnout and related factors among residents in all years across subspecialties. They reported that residents trained in larger subspecialties (such as pediatrics, internal medicine, surgery) had a significantly higher prevalence of burnout, compared to residents in smaller subspecialties (such as ear-nose-throat, ophthalmology). The differences between the larger and smaller subspecialties that might be related to burnout were higher workloads, longer working/duty hours and specific characteristic of the learning environment of larger subspecialties.¹⁵ Summarizing, findings in the literature suggest that learning in an environment that is considered to be demanding is associated with higher levels of burnout. This finding aligns with the conceptual framework of the job demands-resources model (JD-R model, Figure 2.1). “Job demand” is a physical, psychological, social, or organizational aspect of the job that requires effort, while “resources” are aspects of the job that are functional in achieving work goals; decrease job demands or stimulate individual growth, learning, and development.¹⁶⁻¹⁸ High levels of job demand with lack of resources therefore lead to a decrease in work engagement.¹⁹ The educational climate is a crucial factor for residents and tends to impact learning achievement as well as residents wellness. The educational climate has a significant correlation with residents burnout^{20,21}, especially in an intensely demanding workplace where a higher number of work shifts has been associated with a higher level of burnout.^{22,23}

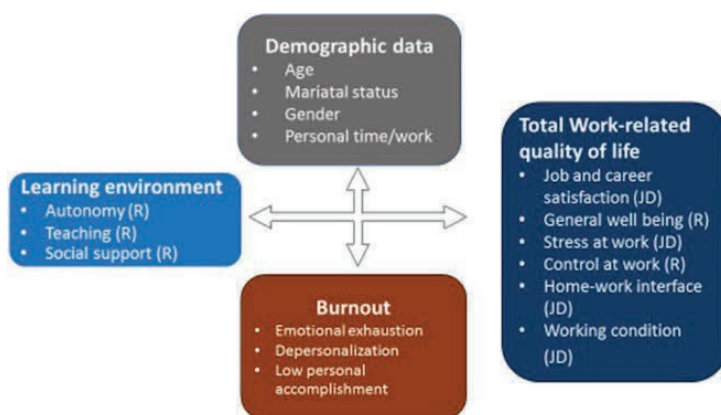


Figure 2.1 The conceptual framework formulated for this study related to the job demands and resources model.

In summary, burnout is a highly prevalent problem among pediatric residents worldwide, with adverse consequences for patient care. Main factors related to burnout in Western countries were job satisfaction, stress at work, control at work, as well as the educational climate. However, as far as we know, factors related to pediatric residents’

burnout especially regarding educational climate and work quality of life have not yet been studied in non-Western contexts. Therefore, this study explored the prevalence of burnout among pediatric residents, and factors related to burn-out in the Thai context, in particular aspects of the educational climate, and work-related quality of life. The study addresses the following research questions (Figure 2.2):

1. To what extent do pediatric residents in a non- Western setting experience burnout? (Quantitative approach)
2. What is the relation between burnout and personal characteristics of residents' learning environment and work-related quality of life? (Quantitative approach)
3. What factors in the medical educational environment and work-related quality of life relate to burnout? (Quantitative and qualitative approach)

Phase	Procedure	Product
Quantitative Data Collection	<ul style="list-style-type: none"> Survey (n=42) 	<ul style="list-style-type: none"> Numeric data (n=41) for the MBI-Health service survey, PHEEM survey, WRQoL survey and personal characteristics
Quantitative Data Analysis	<ul style="list-style-type: none"> Data screening Correlation analysis ANOVA, Pearson correlation Mann-Whitney test SPSS quan, software v.11 	<ul style="list-style-type: none"> Descriptive statistics Correlation results
Case selection Interview Preparation	<ul style="list-style-type: none"> Purposefully selected residents with high level of 2-3 criteria of burnout (n=7) Inform and ask for consent Individual in-depth interview preparation 	<ul style="list-style-type: none"> Participants (n=6)
Qualitative Data Collection	<ul style="list-style-type: none"> Individual in-depth interview with 6 participants Audiotape records Transcription of tapes 	<ul style="list-style-type: none"> Text data (interviews, transcript document)
Qualitative Data Analysis	<ul style="list-style-type: none"> Coding (open, axial, and selective) and thematic analysis Theme development Cross-thematic analysis 	<ul style="list-style-type: none"> Codes and themes
Integration of Quantitative and Qualitative results	<ul style="list-style-type: none"> Interpretation and explanation of the quantitative and qualitative results 	<ul style="list-style-type: none"> Answering the research questions Future research suggestions Practical implication

Figure 2.2 Visual model of the sequential explanatory mixed method study design.

Methods

The study was conducted in the Pediatric Department, Ramathibodi Hospital, Bangkok, Thailand in 2016. An exploratory mixed-methods approach was employed, consisting of sequentially collecting and respectively analyzing quantitative and qualitative data (Figure 2.2). The choice for a mixed methods approach was based on its ability to provide more comprehensive and in-depth details to answer the research questions.

Quantitative phase, surveys

The first phase employed a quantitative cross-sectional survey which included background variables, measurements of burnout, the perceived learning environment, and work-related quality of life. The following background characteristics were measured: age, gender, year of training, marital status, responsibility for the family's or own financial burden, sleep hours/night, study time hours/week, non-academic leisure time hours/week.

Burnout was measured with the Maslach Burnout Inventory (MBI)-Health service survey, an internationally acknowledged and validated instrument.¹ The MBI is a standard 22-item questionnaire (7-point Likert scale). The instrument consists of three sections which measures levels of a) emotional exhaustion, b) depersonalization and c) personal accomplishment.¹⁵ The MBI has previously been translated into Thai and tested for reliability. Cronbach's alpha coefficients for the sections were 0.92, 0.66 and 0.65, respectively.¹⁵

Learning environment was measured with the Postgraduate Hospital Educational Environmental Measure (PHEEM) questionnaire. This questionnaire consists of 40 items, divided into three sections: a) autonomy, b) teaching, and c) social support (5-point Likert scale, ranging from 4 = strongly agree to 0 = strongly disagree). The original instrument, tested in the UK, had a Cronbach's alpha reliability of 0.91.²⁴ Translation into the Thai language was done by an experienced translator in the medical field and then back-translated to English by another experienced translator, leading to further refinement into the Thai language. The original English questionnaire was then analyzed for degree of agreement with the back-translation and rated by three faculty medical instructors from the pediatric department. Kappa's agreement scores ranged between 0.61–0.80 and were confirmed as substantial at 80–95% of agreement.

Work-related Quality of life was measured with the Work-Related Quality of Life scale (WRQoL), a 23-item psychometric scale divided into six subscales of factors contributing to quality of life: Job and Career Satisfaction (JCS), General Well-Being (GWB), Stress at Work (SAW), Control at Work (CAW), Home-Work Interface (HWI) and Working Conditions (WCS). The questionnaire is composed of 5-point Likert scale items (1 = strongly disagree; 5 = strongly agree). Its reliability (Cronbach's alpha of 0.75–0.86) were verified among medical personnel in the United Kingdom.¹² We used the Thai-translated and validated 34item WRQoL version 2 with 7 subscales (Job and Career Satisfaction

(JCS), General Well-Being (GWB), Stress at Work (SAW), Control at Work (CAW), Home-Work Interface (HWI) and Working Conditions (WCS) and employee engagement (EET)), which had a content validity index of the scale of 0.97. Overall Cronbach's alpha was 0.93 with good test-retest reliability of 0.892.²⁵

The three surveys (110 items) were distributed in written format among all 42 pediatric residents across all years of training, also inviting them to later participate in interviews.

Qualitative phase, individual interviews

Purposeful sampling was used, participation was voluntary and withdrawal was possible at any given moment. Residents in all 3 years with a high score in at least two of the three subscales of the MBI questionnaire, and with varying scores on the other questionnaires, were invited (n=7) in order to further explore the perceived influence of educational climate and its relation to burnout. Six residents responded positively and were interviewed individually. The interviews were conducted by PT, who is a supervising physician and the conversations were audio-taped. The interview was semi-structured around general open-ended questions concerning two main topics: a) characteristics in the medical educational environment related to burnout risk, and b) What could be improved in the medical educational environment to reduce the risk of burnout.

Analysis

Quantitative data

The association between categorical data of burnout level and baseline characteristics was calculated using Phi coefficient. To identify the relations between levels of burnout, PHEEM, work-related quality of life and other variables, hierarchical single regression analyses were conducted. Pearson zero-order and Spearman rank-order correlations were used to identify the relation between PHEEM (and subscales) and work-related quality of life.

Qualitative data

Literal transcripts from the interviews were analyzed by two researchers independently. The researchers familiarized with the data by listening to the audio-tapes and reading the full data sets several times. The interviews were coded using an inductive approach. The main findings were verified with the participants in a process of member checking. Any discrepancies in coding were discussed in the research team until consensus was reached.²⁶ Thematic analysis was done by hand and then translated into English. Themes emerged from the independently iterative analysis and then presented as results.

Ethical approval

The study was reviewed and approved by the Institutional Review Board of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University (IRB no.08-58-42). All participants were informed, both verbally and in writing and consented to complete the questionnaire and interview. Since burnout is a sensitive issue, participants had the option to terminate project participation at any stage.

Results

Quantitative part, surveys

Forty-two pediatric residents were invited to participate with a 97% response rate (one refused to participate); 75% of respondents were female. The distribution of responding residents over years 1, 2 and 3 was 15 (36%), 14 (33%) and 12 (29%) respectively (Figure 2.3).

The MBI questionnaire identified 7 residents (17%) perceiving high emotional exhaustion, five (12%) showed high depersonalization and 12 (29%) perceived low personal achievement. None of the residents experienced burnout with high levels of both emotional exhaustion and depersonalization and a low level of personal achievement. However, residents who met 2 of 3 criteria of burnout were able to provide information related to burnout.

The Postgraduate Hospital Educational Environmental Measure (PHEEM) revealed that most of the residents (88%) had a positive perception of their role autonomy. For the perception of teaching, 51% gave scores for teaching between 31 and 45 indicating that the teaching activities might need some improvement. For the social support dimension, 85% thought that there were more pros than cons. The average score of PHEEM was 112.7 (SD=11.2, range 79-134), indicating a rather positive educational environment, but with room for improvement.

Only 5 (out of 41 participants, 12%) reported a good quality of life, while the majority of residents (88%) reported a moderate level of overall work-related quality of life. About 10% of residents reported a low level of employee engagement, poor home-work interface and low general well-being. More than 50% (56%) of residents experienced moderate levels of stress at work and 68% had a negative work-family interface. Also, 54% of the residents were fully satisfied with the work conditions.

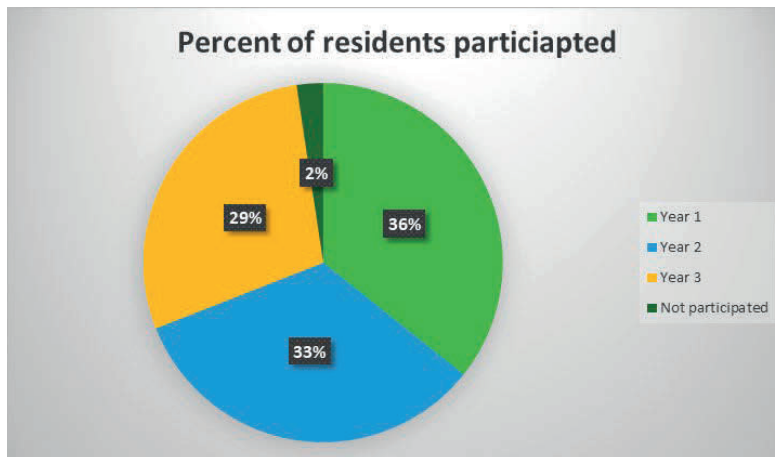


Figure 2.3 Distribution of residents participated in the study in all year.

Factors associated with burnout level

There were no statistically significant association between any burnout subscales and age, gender, marital status age, gender, year of training, marital status, responsibility for the family's or own financial burden, sleep hours per night, study time hours per week and non-academic leisure time hours per week (data not shown). Work-related quality of life had a moderate correlation with emotional exhaustion ($r=0.401$, $p=0.009$). Emotional exhaustion, depersonalization, and personal accomplishment were not associated with the overall

educational climate or residents' perception of social support, teaching and autonomy. Total work-related quality of life had a significant small negative correlation with emotional exhaustion ($r=-0.401$, $p=0.009$) and with depersonalization ($r=-0.332$, $p=0.034$). Analysis of the association between the subscales of MBI and the work-related quality of life indicated a slight to moderate negative relationship between the home-work interface, general well-being, working conditions and emotional exhaustion. In addition, employee engagement, general well-being and working conditions had a slightly negative correlation with depersonalization. Also, general well-being had a moderate positive association with personal accomplishment.

Educational climate and work-related quality of life

The educational climate and work-related quality of life were strongly related ($r=0.678$, $p<0.001$). The analysis of the correlations between the subscales of educational environment and work-related quality of life showed significance for multiple subscales. Perception of role autonomy had a large effect on employee engagement ($r=0.611$, $p<0.001$), general well-being ($r=0.593$, $p<0.001$) and working conditions ($r=0.617$,

$p < 0.001$), with a moderate relationship with control at work ($r = 0.38$, $p = 0.014$). Perception of teaching showed a strong relationship with employee engagement ($r = 0.713$, $p < 0.001$) and had moderate effect on control at work, general well-being, job and career satisfaction and working conditions. Perception of social support showed a significant correlation with all the subscales of work-related quality of life, except stress at work. This could indicate that QOL was affected by social support, see Table 2.1.

Table 2.1 Pearson correlation coefficients between educational environment and work-related quality of life.

	Perceptions of role autonomy	Perceptions of teaching	Perceptions of social support
Employee engagement	0.611 ^a	0.713 ^a	0.579 ^a
Control at work	0.380 ^b	0.604 ^a	0.469 ^a
Home-work interface	0.390 ^b	0.198	0.394 ^b
General well-being	0.593 ^a	0.408 ^a	0.659 ^a
Job and career satisfaction	0.261	0.510 ^a	0.320 ^b
Working conditions	0.617 ^a	0.468 ^a	0.629 ^a
Stress at work	-0.094	-0.357 ^b	-0.097

^a Pearson correlation is significant at the 0.01 level (2-tailed); ^b Pearson correlation is significant at the 0.05 level (2-tailed)

Qualitative part, individual interviews

Six out of the seven residents who met the inclusion criteria of scores on burnout subscales participated in the interviews. Three were first year residents and one was a third-year resident; one participant was male. Factors in educational climate and work-related quality of life were explored in depth to find a relationship with risk of burnout. The following themes which residents perceived to relate to risk of burnout emerged from the qualitative data analysis of the individual interviews:

Educational climate

1. *Inappropriate tasks*

Residents reported execution of undesired tasks such as unnecessary or useless work which contributed to exhaustion.

“When I rotated to a busier hospital outside my institute, I felt less exhausted, even though the number of patients under my responsibility increased. The unnecessary paper work and rule restrictions in that hospital were less than in my institute.” (Female, 3rd year resident)

2. *Teachers, teaching styles, and role as a teacher*

Residents reported stress during various learning activities such as in a conference, or during ward rounds. The stress, in residents' perception, came from teacher's styles and unsafe atmosphere of some learning activities.

Constructive feedback from teachers is crucial for learners to achieve personal or teaching programme-related objectives. Residents prefer teachers who do not display aggressive verbal communication or give negative emotional responses in public.

"I felt pressure in the morning conference as I did not have sufficient time to prepare my case report. Sometimes I can't answer the question, but the teacher still keeps asking more and more questions. I have nothing further to say and I feel stressed."
(Female, 3rd year resident)

Residents' roles as teachers to medical students was perceived as one of the stress burdens as they were expected to spend extra time to teach. Also, evaluation of their teaching at the end of rotation caused them stress and lowers their motivation to guide younger colleagues.

3. *Knowledge insecurity to perform tasks*

Although senior residents and attending staff were available to provide support, they sometimes felt insecure in their knowledge and felt a gap regarding patient care and consequently lacked the confidence to teach the students.

"I can't understand and catch up with the conversations during ward rounds with the Senior Resident and supervisors. I feel that I have insufficient knowledge."
(Female, 1st year resident)

Work-related quality of life

1. *The time dimension*

Residents reported that extra personal time, in addition to duty hours, spent on ward rounds or other work-related activities contributed to burnout.

"When I have limited personal time, I feel exhausted. I cannot remember things and this decreases my learning motivation." (Female, 1st year resident)

2. *Life crisis during training and home-work unbalance*

Limitation of personal time could have an effect on the personal life of residents, especially when critical life events occurred in their private lives.

"Before my mother passed away, I had no time to say goodbye to her. I spent my time taking care of other children instead of talking to my mother when she could communicate with me." (Female, 2nd year resident)

3. Physical environment and facilities

Some residents perceived the need for more and better facilities such as more dormitories and a better quality of available restaurants after office hours, instead of fast food and convenience stores. It was seen as a way to pursue wellbeing. Also, residents want more dormitories in the hospital, in order to create more time in the hospital in the already busy mornings.

"I don't live inside the hospital. I have to travel from the hospital to my home every day. I always feel exhausted." (Female, 2nd year resident) *"It would be nice to have a place to stay near the hospital, so I don't have to waste my time in the traffic." (Female, 3rd year resident)*

4. Role and work allocation clarity

Some work was not clearly allocated, so unexpected workload or repetitive work occurred.

"New patients arrive on the ward at the beginning of night shifts around 5pm. Sometimes the Chief Resident assigns the resident on the ward to assess and care for the patient, instead of the resident on the night shift. Thus, the resident on the ward finishes work late and the resident on the night shift also cares for the patient simultaneously." (Female, 1st year resident)

In summary, the qualitative part explicated some important factors in the educational climate, such as inappropriate tasks, teaching styles and also work-related quality of life in pediatric residents' perception, such as spending extra personal time on work-related activities, and life crisis which relate to risk of burnout.

Discussion

In this study, we examined the prevalence of burnout among pediatric residents as well as the correlation between burnout subscales, personal characteristics, related factors in the educational climate and work-related quality of life in a non-Western context. Although none of the pediatric residents had high burnout levels in all three domains, seven (17%) showed high levels in two out of three conditions studied (emotional exhaustion, level of depersonalization and perceived low personal accomplishment). Results from the survey showed that emotional exhaustion and educational climate were correlated with work-related quality of life. In the interviews, the main themes

related to burnout were inappropriate tasks, teachers and teaching styles, the perception of knowledge insecurity relating to task performance, time dimensions, life crisis during training, role expectations and work allocation clarity, and facilities such as accommodation.

Prevalence of burnout among pediatric residents

A striking finding of the quantitative study was that none of pediatric residents had high burnout levels in all three domains. The explanation of this difference between this current study and the literatures could be the diversity of educational climates between institutions or the social desirability, as our study was confidential but not anonymous. However, seven of the participants in our study with warning signals regarding burnout, reported high scores on two out of the three factors: high emotional exhaustion, high depersonalization and low personal accomplishment. A correlation between burnout subscales, educational climate and work-related quality of life among pediatric residents in the previous studies, was confirmed in our study.^{10-14,20-23}

Factors associated with burnout level

Another finding of our study was a correlation between total quality of life and emotional exhaustion. The characteristics of residents in our study demonstrated no relationship with any of the subscales of the burnout level. This is in line with previous findings Llera and Durante that demographic factors do not relate to at-risk residents.²⁰ However, this contrasts with findings in a study by Shanafelt et al. who identified being older and being married were related to a lower risk for burnout.²⁷ These differences might be explained from the context of Thai pediatric residents who are almost all of similar age, gender (female) and marital status (single).

Moreover, the burnout subscales level of pediatric residents was not related to the overall medical educational environment. This is in line with the study of Meriläinen et al. That reported no relationship between the teaching-learning model of environment and burnout.²⁸ Alternatively, Dyrbye et al. discovered that some learning environment factors were associated with medical students' burnout, but these factors were not included in the PHEEM questionnaire.⁹ In Western countries, factors contributing to burnout were job satisfaction, stress and control at work, working conditions, and home-work interface¹³, while this study added in a non-Western setting, the importance of inappropriate tasks, teachers and teaching styles (including unsafe environment), the perception of knowledge insecurity to perform some tasks, time dimensions, and life crisis occurring during training. These findings thus underscore those differences in factors contributing to burnout exist between different cultures.

Educational environment and work-related quality of life

Noteworthy is that a strong association between educational environment and work-related quality of life was found. A learning climate designed to promote resident's autonomy might benefit resident's work-related quality of life. Perception of a good teaching climate showed a positive relationship with employee engagement, a moderate association with control at work, general wellbeing, job and career satisfaction and working conditions, and a negative correlation for stress at work. In conclusion, educational climate had effects not only on residents' wellbeing but also on stress at work. Thai clinical teachers and curriculum developers, therefore, need to pay more attention to the effect of educational climate rather than focusing on students learning only. Social support showed a significant correlation with all subscales of work-related quality of life, except for stress at work. One possible interpretation is that social support in Thai context could improve the residents' quality of life but is not likely to reduce the stress level at work. Social support in the workplace in the Thai context seems to be lacking at this moment. Nevertheless, social support in the Thai context should be considered as important for residents' wellbeing and would, consequently, needs more attention. Further evidence for this is found in a study among internal medicine and pediatric residents in U.S., where loneliness was associated with burnout, sense of personal accomplishment was associated with greater network centrality²⁹, and interpersonal relationship was related to burnout.¹⁰

The PHEEM questionnaire did not provide detailed information regarding burnout or stress at work and the improvement of the educational environment. The only item of PHEEM with an average score lower than two out of five in the social support subscale was 'there are adequate catering facilities when I am on call'. However, the qualitative study identified some details of work and workloads, roles and relationships with other professions, learning atmosphere, research conduction, teachers' responses, accommodation and restaurants, not included in the PHEEM. These issues are especially important for the residents training programme in Thailand.

A study by Tsai et al. used a new instrument to investigate the relationship between the clinical learning environment and mental distress among post graduate medical students in Taiwan, because of the socio-culture differences between Taiwan and Western countries.³⁰ Unfortunately, this instrument was not validated or tested in other socio-cultural contexts, while PHEEM is currently used in many countries such as UK, Canada, Ireland, China, Indonesia, Malaysia, Norway, Sweden, Brazil, the West Indies and the Yemen.²⁴ The PHEEM, assessing the educational environment, might not be the most suitable tool to assess the stress and resident training environment context in Thailand. Therefore, a new, more valid, questionnaire should be developed to assess the educational environment in the context of non-Western medical education.

The qualitative data also indicated that changes to the educational environment are necessary to lower the risk of burnout. For example, a medical service system that promotes collaboration, is user friendly and decreases unnecessary work, might facilitate the work of residents and lower the levels of exhaustion. Moreover, a

predictable or routine time schedule for working and learning on the wards was preferred by the residents. The teaching schedule should fit with the flow of work during the day and also not disturb residents' personal time. This finding was similar to U.S. pediatric residents reporting that time demands contributed to burnout.¹⁰ In addition, the role and work allocation should be clarified and properly scheduled to fit with the learning process and minimize learning disturbances at the workplace. Lastly, this study suggested that considering adopting different teaching styles and methods such as constructive feedback, investing time and effort in interventions contributing to a safe learning climate and paying attention to a faculty mistreatment which could contribute to medical students burnout. Further studies focusing on teaching styles, safe learning climate and mistreatment in a non-Western context are needed. Also the provision of improved faculty development programmes might enhance teaching, assessment and curriculum design and might require institutional policies supporting the programme.³¹

Strengths and limitations of the study

The strength of this study is the mixed method design, combining quantitative and qualitative methodologies, which facilitates in-depth information gathering on the related factors of burnout and also exploration of other factors included in the quantitative part. This study also has limitation such as the small sample size, setting limitations to multivariate analysis. Also, the relationship between researchers and participants requires consideration. Although participants were informed that the data was confidential, they might not be comfortable to reveal negative information or may have given socially and culturally desirable answers. Moreover, this exploratory study was conducted in only one hospital, which might limit its generalizability to other settings. Further studies will be needed.

Conclusion

Although a relation was found between subscales of burnout, quality of life and educational climate, this mixed methods study did not show substantial burnout among pediatric residents in the Thai context.

The factors of the educational environment that were perceived to require improvement in order to reduce the risk of burnout were: minimization of unnecessary or duplicated workloads, time schedule arrangements to avoid extension of regular duty hours, and the clarity of role expectations, work allocation, perceptions of teacher roles, institution of a faculty development programme, and improvement of the facilities and the infrastructure such as accommodation. These factors should consequently be considered and addressed in the curriculum and clinical workplace of pediatric residents in training.

References

1. Maslach C. Professional burnout: recent developments in theory and research. In: Maslach C, Schaufeli WB, Marek T, editors. *Burnout: a multidimensional perspective*. 6th ed. Washington, DC: Taylor & Francis; 1993:19–32.
2. American Academy of Pediatrics: Periodic Survey of Fellows No. 81. 2012.
3. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc*. 2015;90(12):1600–13.
4. Baer TE, Feraco AM, Tuysuzoglu Sagalowsky S, Williams D, Litman HJ, Vinci RJ. Pediatric resident burnout and attitudes toward patients. *Pediatrics*. 2017;139(3):e20162163..
5. de Andrade AP, Amaro E Jr, Farhat SC, Schvartsman C. Higher burnout scores in paediatric residents are associated with increased brain activity during attentional functional magnetic resonance imaging task. *Acta Paediatr*. 2016;105(6):705–13.
6. Nolan KJ, Writer H, Ladhani M. Wellness in Canadian paediatric residents and their program directors.; Canadian Pediatric Program Directors Research Group. *Paediatr Child Health*. 2017;22(4):199–202.
7. Simpkin AL, Khan A, West DC, Garcia BM, Sectish TC, Spector ND, Landrigan CP. Stress from uncertainty and resilience among depressed and burned out residents: a cross-sectional study. *Acad Pediatr*. 2018; 18(6):698–704.
8. Pantaleoni JL, Augustine EM, Sourkes BM, Bachrach LK. Burnout in pediatric residents over a 2-year period: a longitudinal study. *Acad Pediatr*. 2014;14(2): 167–72.
9. Olson K, Kemper KJ, Mahan JD. What factors promote resilience and protect against burnout in first-year pediatric and medicine-pediatric residents? *J Evid Based Complementary Altern Med*. 2015;20(3):192–8.
10. Danna K, Griffin RW. Health and well-being in the workplace: a review and synthesis of the literature. *J Manag*. 1999;25:357–84.
11. Killian JG. Career and technical education teacher burnout: impact of humor-coping style and job-related stress. Carbondale: Southern Illinois University; 2004.
12. Van Laar D, Edwards JA, Easton S. The work-related quality of life scale for healthcare workers. *J Adv Nurs*. 2007;60:325–33.
13. Karaoglu N, Pekcan S, Durduran Y, Mergen H, Odabasi D, Ors R. A sample of paediatric residents' loneliness-anxiety-depression-burnout and job satisfaction with probable affecting factors. *J Park Med Assoc*. 2015;65(2):183–91.
14. Nomura O, Mishina H, Kobayashi Y, Ishiguro A, Sakai H, Kato H. Limitation of duty hour regulations for pediatric resident wellness: a mixed methods study in Japan. *Medicine (Baltimore)*. 2016;95(37):e4867.
15. Srikam S, Jiamjarasrangsri W, Lalitanantpong D. Job burnout and related factors among residents of King Chulalongkorn Memorial Hospital. *J Psychiatr Assoc Thailand*. 2014;59(2):139–50.
16. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands- resources model of burnout. *J Appl Psychol*. 2001;86:499–512.
17. Bakker AB. An evidence-based model of work engagement. *Curr Dir Psychol Sci*. 2011;20(4):265–9.
18. Bakker AB, Demerouti E. The job demands-resources model: state of the art. *J Manag Psychol*. 2007;22(3):309–28.
19. Schaufeli W, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav*. 2004; 25(3):293–315.
20. Llera J, Durante E. Correlation between the educational environment and burn-out syndrome in residency programs at a university hospital. *Arch Argent Pediatr*. 2014;112(1):6–11.
21. van Vendeloo SN, Prins DJ, Verheyen CCPM, Prins JT, van den Heijkan F, van der Heijden FMMA, Brand PLP. The learning environment and resident burnout: a national study. *Perspect Med Educ*. 2018;7(2):120–5.
22. Wolfe KK, Unti SM. Critical care rotation impact on pediatric resident mental health and burnout. *BMC Med Educ*. 2017;17(1):181.
23. Anıl M, Yurtseven A, Yurtseven İ, Ülgen M, Anıl AB, Helvacı M, Aksu N. The evaluation of burnout and job satisfaction levels in residents of pediatrics. *Turk Pediatri Ars*. 2017;52(2):66–71.

24. Roff S, McAleer S, Skinner A. Development and validation of an instrument to measure the postgraduate clinical learning and teaching educational environment for hospital-based junior doctors in the UK. *Med Teach*. 2005; 27(4):326–31.
25. Sirisawasd P, Chaiear N, Johns NP, Khiewyoo J. Validation of the Thai version of a work-related quality of life scale in the nursing profession. *Saf Health Work*. 2014;5(2):80–5.
26. Watling CJ, Lingard L. Grounded theory in medical education research: AMEE guide no. 70. *Med Teach*. 2012;34(10):850–61.
27. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172(18):1377–85.
28. Meriläinen M. Factors affecting study-related burnout among Finnish university students: teaching-learning environment, achievement motivation and the meaning of life. *Qual High Educ*. 2014;20(3): 309–29.
29. Shapiro J, Zhang B, Warm EJ. Residency as a social network: burnout, loneliness, and social network centrality. *J Grad Med Educ*. 2015;7(4):617–23.
30. Tsai JC, Chen CS, Sun IF, Liu KM, Lai CS. Clinical learning environment measurement for medical trainees at transitions: relations with socio-cultural factors and mental distress. *BMC Med Educ*. 2014;14:226.
31. McLean M, Cilliers F, Van Wyk JM. Faculty development: yesterday, today and tomorrow. *Med Teach*. 2008;30(6):555–84.

Chapter 3

Exploring burnout and depression of Thai medical students: the psychometric properties of the Maslach burnout inventory

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Abstract

Objectives

To examine the psychometric properties of the Maslach Burnout Inventory-Student Survey (MBI-SS) Thai version and to determine the frequency of burnout and correlation between burnout and associated factors.

Methods

A cross-sectional study was conducted among undergraduate medical students using convenience sampling (n=545, 76.1% response rate, female 52.1%). Data were collected by a self-report survey. The MBI-SS was translated in Thai and tested for internal consistency using Cronbach's co-efficient alpha. A confirmatory factor analysis was performed using as fit indices of the chi-square and degree of freedom ratio (χ^2/df), Comparative Fit Index (CFI), the Goodness of Fit Index (GFI), the Non-normed Fit Index (NNFI), Akaike information criterion (AIC) and the Root Mean Square Error of Approximation (RMSEA). Spearman and Kendall's tau-b were used to identify correlations between burnout, depression and other factors.

Results

Interrater reliability was acceptable with Kappa of 0.83. Confirmatory factor analysis demonstrated good fit indices ($\chi^2/df=197.62/83$, CFI=0.97, GFI=0.95, NNFI=0.96, AIC=271.62 and RMSEA=0.06). Burnout had a weak, positive association with the PHQ-9 ($r=0.294$, $df=2$, $p<0.001$). The screening depression score had a significant, modest positive association with emotional exhaustion ($r=0.469$, $df=4$, $p<0.001$) and cynicism ($r=0.411$, $df=4$, $p<0.001$), and a weak inverse association with professional efficacy ($r=-0.273$, $df=4$, $p<0.001$).

Conclusions

The Thai version of the MBI-SS had adequate psychometric properties among Thai medical students and can be used to assess burnout among undergraduate medical students in Thailand. Burnout was associated with risk for depression. Further studies on other associated factors contributing to depression are suggested.

Introduction

Burnout, as defined by Maslach¹, includes three key subscales, namely, high emotional exhaustion, high depersonalisation and lack of professional efficacy, which relates to the critical social environment in the health care setting. Emotional exhaustion is one of the responses of stress when people feel overwhelmed by job demands but lack emotional or physical resources to cope with these demands. Depersonalisation represents the interpersonal context component that refers to a negative, hard-hearted or excessively detached response to various aspects of the job. Lack of professional efficacy is a feeling of self-incompetence, lack of reducibility or lack of job achievement.² The Maslach Burnout Inventory (MBI) is a self-assessment questionnaire that was introduced in 1981³ and is the gold standard for measuring burnout.³ The MBI has three versions: Human Services survey (MBI-HSS), General survey (MBI-GS) and General survey for student (MBI-GS(S)) and Educators survey (MBI-ES). In 2002, Schaufeli and colleagues⁴ developed the Maslach Burnout inventory – Student Survey (MBI-SS) to assess burnout among university students and consisting of 15 items rated by a seven-point frequency rating scale ranging from 0 (never) to 6 (always) and three subscales: emotional exhaustion (five items), depersonalisation (four items) and professional efficacy (six items).

The psychometric properties of the MBI-SS were shown to have adequate validity and reliability in Spain, Portugal, The Netherlands, Brazil, Italy and France.^{4–7} Among non-Western countries, the MBI-SS is found to have acceptable psychometric properties in Serbia, Turkey (high school students), Iran and South Korea.^{8–12} However, the Japanese version of the MBI-SS needed minor changes to improve the fit of its three-factor model.¹³ In addition, Hu and Schaufeli¹⁴ demonstrated low internal consistency of the Chinese MBI-SS necessitating the reformulation of some items. In summary, the MBI-SS of some non-Western countries needed adaptation of items to improve its validity and reliability. This may also apply to Thailand. The Thai culture may contrast with most Western countries and even with the culture in some non-Western countries. Furthermore, studies in Thailand have so far focused on residents, not on undergraduate medical students. Moreover, a Thai version of the MBI-SS is lacking and the validity of its psychometric properties has not been studied so far. Therefore, the construction of the Thai version of the MBI-SS and subsequent testing of its psychometric properties among Thai medical students before utilisation are needed. Consequently, this study aimed to test the psychometric properties of the Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS) and to determine if the occurrence of burnout and its subscales are potentially correlated with depression, years of training, gender and grade point average (GPA) among Thai undergraduate medical students.

A Thai version of the MBI-SS with sufficient psychometric properties would guarantee the accurate measurement of burnout among undergraduate medical students and improve understanding of burnout in medical students in non-Western countries.

Methods

Participants

A cross-sectional study was conducted among undergraduate medical students in Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, using convenience sampling ($n=545$, 76.1% response rate, female 52.1%). Participants who incompletely responded and those with extreme responses to multiple questions in the questionnaire were excluded. Four hundred fifty-one completed responses (62.9%) were finally included. In the preclinical years, 361 medical students completed the survey (48.3% female). In the clinical years, 190 medical students completed the surveys (52.1% female). Medical students in the preclinical and clinical years were asked to complete the written questionnaire in the last semester of the academic year 2016. The curriculum consisted of a three-year preclinical course (mostly classroom learning) and three-year clinical clerkships. Year 2-5 under-graduate medical students were enrolled to represent both preclinical and clinical years. First- and sixth-year medical students studying outside Ramathibodi Hospital were excluded. All participants provided written informed consent prior to responding and subsequent data collection was confidential. Data handling and accessibility were allowed only for the members of the research team. This study was approved by the Ethics Committee of the Faculty of Medicine of Ramathibodi Hospital, Mahidol University.

Procedure

Permission to translate the Maslach Burnout Inventory-general survey for students into a Thai version was obtained from Mind Garden, Inc. The Thai version of the Maslach Burnout Inventory-general survey for students (MBI-SS) was developed to measure burnout among Thai undergraduate medical students by a two-stage process, namely, the translation process and testing the resulting version for factorial validity and psychometric properties. The translation process—‘forward’ translation from English to Thai and ‘backward’ into English—was done by two independent experienced translators. The Thai translation was reviewed by a panel of experts including three faculty medical instructors (from paediatrics, family medicine, and clinical epidemiology departments) and based on their suggestions, minor cultural adaptations to fit with Thai context, and to maintain translation quality was performed. The expert panel and a native English speaker (a physician from the family medicine department) then rated for degree of agreement with the original version and the back-translation into English. Finally, pilot testing was performed that showed 10 medical students had no difficulties in understanding and completing the questionnaire.

The next phase consisted of psychometric properties testing of the Thai version of the MBI-SS, 15-item questionnaire consisted 3 subscales: Emotional exhaustion (5 items), Depersonalization (4 items), Professional efficacy (6 items) and rated by 7-point frequency rating scale ranging from 0 (never) to 6 (always). Emotional exhaustion scores

over 14 are considered as high level, depersonalization scores over 6 are considered as high level, and personal efficacy score lower than 23 is considered as low level. A study in Spanish (n=621), Portuguese (n=723), and Dutch (n=309) revealed that the three-factor structure (emotional exhaustion, depersonalization, and personal efficacy) of the MBI-SS fits to the data in the Spanish ($\chi^2/\text{df}=209.48/81$, CFI=0.95, TLI=0.94 and RMSEA=0.05), Portuguese ($\chi^2/\text{df}=280/82$, CFI=0.93, TLI=0.92 and RMSEA=0.06), and Dutch ($\chi^2/\text{df}=127.14/83$, CFI=0.97, TLI=0.96 and RMSEA=0.04). Intercorrelation and internal consistencies (Cronbach's alpha values) of the MBI-SS subscales of Spain, Portugal, Netherland were 0.74-0.79, 0.69-0.86, and 0.67-0.86, respectively. Most of them met the criterion of 0.7.⁴

Data collected included gender, study year, grade point average (GPA), non-academic time, sleeping time and screening scores for students' depression (see below). The GPA refers to the cumulative average of grades during their course of study and reflects academic performance on a scale of 0–4 (4 is the best academic performance score). A GPA of less than two is considered to be a 'fail' in terms of summative assessment, and the student would then be expected to repeat certain blocks or subjects in the next academic year.

The depression screening tool used in this study is the Thai version of the Patient Health Questionnaire-9 (PHQ-9), a 9-item validated questionnaire. The Thai version of the PHQ-9 had satisfactory internal consistency (Cronbach's alpha = 0.79) and has acceptable psychometric properties for screening for major depression in general practice with cut-off score of greater than 9.¹⁵

The 33-item written questionnaire including demographic data was subsequently distributed in written format among pre-clinical and clinical year medical students after lecture hall activities by the first author in the last semester of the academic year in February to June 2017, a strategy empirically known to provide a higher response rate in Thai culture.

Data analysis

The interrater reliability (IRR) by means of Kappa was assessed to identify the degree of agreement. Data from the questionnaire was tested for psychometric properties. Internal consistency was analysed to demonstrate the level of reliability, measured with a standardised Cronbach's coefficient alpha. A Cronbach's alpha ≥ 0.7 was considered acceptable, although we preferred alpha ≥ 0.8 .¹⁶

As cross-culture and language differences between Western and non-Western countries have to be taken into account, a confirmatory factor analysis (Principal Component Analysis) was used to confirm the structure validity of the Thai version MBI-SS and to compare similarity to the original hypothesised measurement model MBI-SS, English version. First, the psychometric sensitivity evaluation was conducted by measuring central tendency and shape. Items with skew (Sk) above three and kurtosis (ku) above 3, in absolute values, were directed to sensitivity problems. Fit indices used for

confirmatory factor analysis were the chi-square and degree of freedom ratio (χ^2/df), Comparative Fit Index (CFI), the Goodness of Fit Index (GFI), the Non-normed Fit Index (NNFI), Akaike information criterion (AIC) and the Root Mean Square Error of Approximation (RMSEA). The model fit was considered suitable for χ^2/df (chi-square and degree of freedom ratio) values of less than 5. When the CFI, GFI, and NNFI values were greater than 0.90, the model was considered an adequate fit.^{4,17,18} A RMSEA value of less than 0.08 indicated an acceptable model-data fit, whereas a value above 0.10 indicated that the model should be rejected.^{4,19} Spearman and Kendall's tau-b method was used to identify correlations between burnout and other factors. Confirmatory factor analysis, descriptive data, and correlation analysis was performed by using AMOS® version 18.0 program, SPSS Statistics for Windows, version x.0 (SPSS Inc., Chicago, IL, USA).

Results

Reliability

In the translation process from the English to the Thai version, the backward translation and the original English version were compared and analysed for interrater reliability. The Thai version of MBI-SS showed an acceptable value of Kappa = 0.83.

The internal consistency of the questionnaire was good with a Cronbach's alpha value of 0.80. The Cronbach's alpha coefficient values for emotional exhaustion, depersonalisation and person accomplishment were 0.89, 0.81, and 0.70, respectively. Mean, standard deviation and intercorrelations between each subscale are reported in Table 3.1.

Table 3.1 Means, standard deviations, Cronbach's indices of internal consistency and intercorrelations.

Burnout Subscales	Mean	SD	Cronbach's <u>alpha</u>	Intercorrelations	
Emotion exhaustion	16.20	6.90	0.8888		
Depersonalization	9.08	5.44	0.8124	0.6002	
Personal efficacy	20.85	5.93	0.6979	0.1616	-0.0192

Confirmatory factor analysis

The CFI and GFI values of the three-factor model (M1) were 0.85 and 0.85, which did not satisfy the respective criteria. The modified three-factor model (M2) was slightly adjusted using modification indices provided by AMOS. The modified three-factor model (M2) improved the model-data fit to acceptable values of CFI=0.97 and GFI=0.95. The confirmatory factor analysis demonstrated good fit indices of the Thai version of the MBI-SS, namely, χ^2/df =197.62/83, CFI=0.97, GFI=0.95, NNFI=0.96, AIC=271.62, and RMSEA=0.06 (Table 3.2).

Table 3.2 Results of the confirmatory factor analysis of the Thai version of MBI-SS.

Acceptable values ^{4,17-19}	Chi-square	Degree of freedom	CFI	GFI	NNFI	AIC	RMSEA
	Chi-square/degree of freedom <5			>0.90			<0.08
Model 1 (M1): Three factors	598.28	87	0.85	0.86	0.82	664.38	0.11
Model 2 (M2): Modified three factors	197.62	83	0.97	0.95	0.96	271.62	0.06

The path diagram with standard factor loadings of the 15-item Thai version of MBI-SS (Figure 3.1) indicated standardised coefficients of the relationship between factors and items between 0.51–0.90 (Table 3.3).

Table 3.3 Standardised coefficients of the relationship between factors and items of the Thai version of MBI-SS (n=451).

Item	Coefficients	Standard Error	Factor Loading
Emotional Exhaustion			
item 1	1		0.790
item 4	0.988	0.051	0.770
item 7	1.121	0.056	0.897
item 10	0.921	0.062	0.685
item 13	1.016	0.064	0.719
Depersonalisation			
item 2	1		0.641
item 5	1.055	0.061	0.730
item 11	0.759	0.084	0.544
item 14	0.81	0.085	0.575
Personal Efficacy			
item 3	1		0.603
item 6	0.918	0.103	0.513
item 8	1.316	0.114	0.729
item 9	1.116	0.1	0.692
item 12	1.228	0.107	0.719
item 15	1.127	0.1	0.700

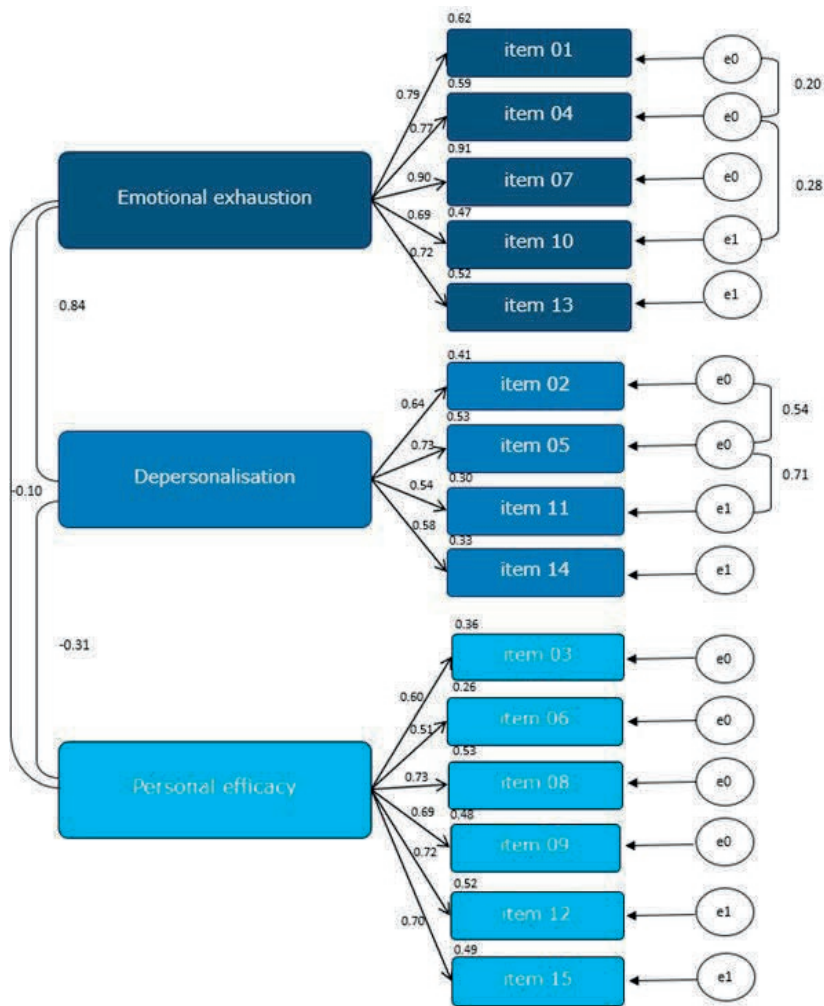


Figure 3.1 Path diagram with standard factor loadings of the 15-item Thai version of MBI-SS (n=451).

The average GPA was 3.27 and 3.22 among pre-clinical and clinical year medical students, respectively (Table 3.4). Forty percent of the participants had a high risk of depression (score above 9) as identified by the PHQ-9 screening tool. The prevalence of burnout on all three subscales among medical students was 28.4% (n=128) as identified both by low personal accomplishment, high emotional exhaustion, and high depersonalisation. Medical students' perceptions of burnout on subscales were 54.8% for low personal accomplishment, 57.4% for high emotional exhaustion and 65% for high depersonalisation.

Table 3.4 Baseline characteristics of the participants (N=451).

Baseline Characteristics	n	%
Year		
2 nd	125	27.7
3 rd	136	30.2
4 th	143	31.7
5 th	47	10.4
GPA		
<2.80	63	14.0
2.80–3.249	149	33.0
3.25–3.499	107	23.7
≥3.5	132	29.3
Mean (SD)	3.25	(0.37)
Min (max)	2.11	(3.97)
Gender	n	%
Male	225	49.9
Female	226	50.1
PHQ-9 Depression score		
0-4	115	25.5
5-9	153	33.9
10-14	140	31.0
15-19	29	6.4
20-27	14	3.1
Burnout subscale		
Personal efficacy		
High	85	18.8
Moderate	119	26.4
Low	247	54.8
Emotional exhaustion		
Low	83	18.4
Moderate	109	24.2
High	259	57.4
Depersonalisation		
Low	30	6.7
Moderate	128	28.4
High	293	65.0

Associated factors

Statistically significant, yet weak negative correlations between burnout and GPA ($r=-0.119$, $df=3$, $p=0.002$) and gender (male) ($r=-0.139$, $df=1$, $p=0.003$) were found. Students who had better academic performance and male gender had lower risk for burnout. Burnout also had weak positive associations with the depression score (PHQ-9, $r=0.294$, $df=2$, $p<0.001$). Risk of depression had a significant, yet modest positive association with emotional exhaustion ($r=0.469$, $df=4$, $p<0.001$) and depersonalisation ($r=0.411$, $df=4$, $p<0.001$), and a weak inverse association with professional efficacy ($r=-0.273$, $df=4$, $p<0.001$). These findings indicate that students that experienced emotional exhaustion and/or depersonalisation were at risk for depression as well as students who perceived low personal efficacy. Female gender was positively associated

with professional efficacy ($r=0.104$, $df=2$, $p=0.020$). A higher GPA was weakly and negatively associated with depersonalisation ($r=-0.112$, $df=6$, $p=0.017$) (Table 3.5).

Table 3.5 Correlations between burnout, its subscales and factors.

Factors	Burnout			Professional Efficacy			Emotional Exhaustion			Depersonalisation		
	correlation	p-value	df	correlation	p-value	df	correlation	p-value	df	correlation	p-value	df
Year†	-0.055	0.203	3	0.083	0.652	6	0.063	0.131	6	0.029	0.501	6
GPA	-0.119*	0.002	3	0.234	<0.001	6	-0.053	0.265	6	-0.112*	0.017	6
Gender‡	-0.139*	0.003	1	0.104*	0.020	2	-0.064	0.153	2	0.059	0.200	2
Depression screening (PHQ9)	0.294*	<0.001	2	-0.273*	<0.001	4	0.469*	<0.001	4	0.411*	<0.001	4

*Statistically significant with $p<0.005$, †Spearman correlation, ‡Kendall's tau-b correlation, df = degree of freedom.

Discussion

This study investigated burnout among Thai undergraduate medical students. It tested the psychometric properties of the Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS) and determined if the occurrence of burnout and its subscales were potentially correlated with other factors such as depression, years of training, gender and grade point average (GPA). The results revealed acceptable interrater reliability with Kappa of 0.83, and confirmatory factor analysis demonstrated good fit indices. Thus, this study revealed sufficient reliability and validity of the Thai version of the MBI-SS. The internal consistency with a Cronbach's alpha value of 0.80 was found to be acceptable as also reported by previous studies in Spain, Portugal, Brazil, Turkey (high school students) and Iran,⁴⁻⁷ but somewhat contrasting to the results of a study on the Chinese MBI-SS.¹⁴ In the Chinese context, items 4 and 13 were ambiguous because the activities during a day in university or attending in the class were perceived to be pleasant or relaxing. Therefore, the suggestion was to reformulate these two items to make them more specific for the study.¹⁴ Similarly, the Japanese version of the MBI-SS was suggested to revise the word 'tsukare' in items 1 and 2 to differentiate between the original English words of 'drained' and 'used up'.¹

In this study, the confirmatory factor analysis confirmed that the three-factor model in the translation fitted the initial structure and, thus, has sufficient validity without the need for reformulation of the items. This contrasts with the Japanese and Chinese versions in which some words needed to be reformulated due to the ambiguous meanings in their cultures. This suggests that languages and terminology of the seemingly same word could have different meaning and refer to different things in different countries with different context.

The prevalence of burnout (as identified by the three subscales of low personal accomplishment, high emotional exhaustion and high depersonalisation) was 28%. This prevalence is lower than reported in most of the previous studies among medical and

health science students in which the burnout prevalence was up to 70%.²⁰⁻²⁵ However, the majority of the Thai undergraduate medical students perceived either low personal accomplishment, high emotional exhaustion or depersonalisation, which is similar to studies conducted internationally.²⁰⁻²⁴ This study suggests that students of male gender and lower academic performance were at higher risk of burnout. Although Backović and colleagues²⁵ found that female students were more vulnerable to stress and burnout, Chunming and colleagues²⁶ also indicated that male students had greater burnout risk. In China, Liu and colleagues²⁷ showed an association between higher grades and increased burnout risk, which was in contrast to this study. We speculate that in Thai culture, GPA may be important for professional identity formation. Medical students with higher GPA may feel more relieved after achieving these academic goals and may become more popular and accepted among peers, teachers or even their families. Consequently, they might perceive a higher level of personal accomplishment and, thus, be at lower risk for burnout. Evidence of a correlation between burnout and depression was also demonstrated in this study: burnout had a weak, positive association with the PHQ-9. The screening depression score had a significant, but modest positive association with emotional exhaustion and cynicism, and a weak negative association with professional efficacy. Students who experience high emotional exhaustion and/or depersonalisation as well as low personal efficacy were at risk for depression, similar to the findings of a previous study in Oman.²⁸ The findings of the present study, when put in perspective of the literature, underscore that the demonstrated link between burnout and depression among medical students is to some extent generalizable across cultures. In addition, in a study of freshman and sophomore premedical students of Indiana University, Grace²⁹ also indicated a positive relationship between depressive symptoms and burnout. This indicates that early signs of these conditions could pre-exist before entering medical education and, subsequently, might increase during the process of professional identity formation while in medical school.³⁰ Moreover, burnout and depressive symptoms were found to be associated with suicidal risk.³¹ Similar to this study, Kroskaa and colleagues³² and Rotenstein and colleagues³³ found 25% and 28%, respectively, of medical students, experience depressive symptoms. However, the depression screening tool used in this study was to identify high-risk students to be able to offer further formal mental health diagnosis and treatment. The results of this study could contribute to insight and raised awareness amongst medical teachers and educationalists of the potential contributory factors and impact of burnout among medical students.

Strengths and limitations

The strengths of this study include the adequate sample size of the students that helped facilitate the factorial validation of the items and test of the psychometric properties of the questionnaire. This study also provides evidence that the psychometric properties of the Thai version of MBI-SS are valid and allow opportunities for further research on

burnout within the Thai context. It is important to note that the prevalence of depression among medical students was not included in this study, and the PHQ-9 was used as a screening tool that only indicates risk of depression and not a diagnostic tool. A limitation of this study was the self-administered questionnaires, which might have been answered dishonestly, due to social desirability. Also, some students who were experiencing burnout or depression might not have responded, so the reported frequency might be an underestimate.

Conclusions

This study provides new insight regarding the psychometric properties of this Thai version of the MBI-SS. It shows that the items have a good fit in the structure of the questionnaire and are valid without the need for any reformulation. The interrater reliability of the items and the internal consistency were sufficient. Thus, the Thai version of the MBI-SS can potentially be used to assess burnout among undergraduate medical students in Thailand both in the preclinical and clinical years. The prevalence of burnout among medical students was 28.4%. A correlation between burnout, its subscales, and risk for depression was identified for Thailand, similarly to other cultures. Male gender and lower academic performance (GPA) were associated with higher risk of burnout. Further studies on other associated factors contributing to burnout and risk for depression in non-Western context are needed to provide more insights and facilitate transfer to potential solutions to alleviate these interlinked problems.

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References

1. Schaufeli WB, Maslach C, Marek T. Professional burnout: recent developments in theory and research. New York: CRC Press; 2018.
2. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry*. 2016;15(2):103-111.
3. Maslach C, Jackson SE. The measurement of experienced burnout. *Journal of Organizational Behavior*. 1981;2:99-113.
4. Schaufeli WB, Martínez IM, Pinto AM, Salanova M, Bakker AB. Burnout and engagement in university students: a cross-national study. *Journal of Cross-Cultural Psychology*. 2002;33(5):464-481.
5. Campos JADB, Maroco J. Maslach burnout inventory — student survey: Portugal-Brazil cross-cultural adaptation. *Rev Saude Publica*. 2012;46:816–824.
6. Portoghese I, Leiter MP, Maslach C, Galletta M, Porru F, D'Aloja E, et al. Measuring burnout among university students: factorial validity, invariance, and latent profiles of the Italian version of the Maslach Burnout Inventory Student Survey (MBI-SS). *Front Psychol*. 2018;9:2105.
7. Faye-Dumanget C, Carré J, Le Borgne M, Boudoukha PAH. French validation of the Maslach Burnout Inventory-Student Survey (MBI-SS). *J Eval Clin Pract*. 2017;23(6):1247–1251.
8. Ilic M, Todorovic Z, Jovanovic M, Ilic I. Burnout syndrome among medical students at one university in Serbia: validity and reliability of the Maslach Burnout Inventory-Student Survey. *Behav Med*. 2017;43(4):323-328.
9. Kutsal D, Bilge F. A study on the burnout and social support levels of high school students. *Eğitim ve Bilim*. 2012;37(164):283-297.
10. Yavuz G, Dogan N. Maslach Burnout Inventory-Student Survey (MBI-SS): a validity study. *Procedia-Social and Behavioral Sciences*. 2014;116:2453-2457.
11. Rostami Z, Abedi MR, Schaufeli WB, Ahmadi SA, Sadeghi AH. The psychometric characteristics of Maslach Burnout Inventory Student Survey: a study students of Isfahan University. *Zahedan Journal of Research in Medical Science*. 2014; 16(9):55-58.
12. Shin H, Puig A, Lee J, Lee JH, Lee SM. Cultural validation of the Maslach burnout inventory for Korean students. *Asia Pacific Education Review*. 2011; 12(4):633-639.
13. Tsubakita T, Shimazaki K. Constructing the Japanese version of the Maslach Burnout Inventory–Student Survey: confirmatory factor analysis. *Jpn J Nurs Sci*. 2016;13(1):183–188.
14. Hu Q, Schaufeli WB. The factorial validity of the Maslach Burnout Inventory-Student Survey in China. *Psychol Rep*. 2009;105(2):394–408.
15. Lotrakul M, Sumrithe S, Saipanish R. Reliability and validity of the Thai version of the PHQ-9. *BMC Psychiatry*. 2008;8:46.
16. Kline P. Handbook of psychological testing. London: Taylor & Francis; 2013.
17. Maroco J. *Análise de Equações Estruturais: fundamentos teóricos, software & aplicações*. Lisboa: Saraiva; 2010.
18. Zhang Y, Gan Y, Cham H. Perfectionism, academic burnout and engagement among Chinese college students: a structural equation modeling analysis. *Personality and Individual Differences*. 2007;43(6):1529–1540.
19. Hoyle RH. *Structural equation modeling: concepts, issues, and applications*. London: SAGE Publications; 1995.
20. Almeida GC, Souza HR, Almeida PC, Almeida BC, Almeida GH. The prevalence of burnout syndrome in medical students. *The Archives of Clinical Psychiatry*. 2016;43:6-10.
21. Santen SA, Holt DB, Kemp JD, Hemphill RR. Burnout in medical students: examining the prevalence and associated factors. *South Med J*. 2010;103(8):758-763.
22. Dyrbye LN, Thomas MR, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. Personal life events and medical student burnout: a multicenter study. *Acad Med*. 2006;81(4):374-384.
23. Ishak W, Nikravesh R, Lederer S, Perry R, Ogunyemi D, Bernstein C. Burnout in medical students: a systematic review. *Clin Teach*. 2013;10(4):242-245.

24. Boni RAS, Paiva CE, de Oliveira MA, Lucchetti G, Fregnani JHTG, Paiva BSR. Burnout among medical students during the first years of undergraduate school: prevalence and associated factors. *PLoS One*. 2018;13(3): e0191746.
25. Backović DV, Zivojinović JI, Maksimović J, Maksimović M. Gender differences in academic stress and burnout among medical students in final years of education. *Psychiatr Danub*. 2012;24(2):175-181.
26. Chunming WM, Harrison R, MacIntyre R, Travaglia J, Balasooriya C. Burnout in medical students: a systematic review of experiences in Chinese medical schools. *BMC Med Educ*. 2017;17(1):217.
27. Liu H, Yansane AI, Zhang Y, Fu H, Hong N, Kalenderian E. Burnout and study engagement among medical students at Sun Yat-sen University, China: a cross-sectional study. *Medicine (Baltimore)*. 2018;97(15):e0326.
28. Al-Alawi M, Al-Sinawi H, Al-Qubtan A, Al-Lawati J, Al-Habsi A, Al-Shuraiqi M, et al. Prevalence and determinants of burnout syndrome and depression among medical students at Sultan Qaboos University: a cross-sectional analytical study from Oman. *Arch Environ Occup Health*. 2019;74(3): 130-139.
29. Grace MK. Depressive symptoms, burnout, and declining medical career interest among undergraduate premedical students. *Int J Med Educ*. 2018;9:302-308.
30. Goel AD, Akarte SV, Agrawal SP, Yadav V. Longitudinal assessment of depression, stress, and burnout in medical students. *J Neurosci Rural Pract*. 2016;7(4):493-498.
31. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, et al. Burnout and suicidal ideation among U.S. medical students. *Ann Intern Med*. 2008;149(5):334-341.
32. Kroska EB, Calarge C, O'Hara MW, Deumic E, Dindo L. Burnout and depression in medical students: relations with avoidance and disengagement. *Journal of Contextual Behavioral Science*. 2017;6(4): 404-408.
33. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. *JAMA*. 2016;316(21): 2214–2236.

Chapter 4

Promoting a sense of belonging,
engagement, and collegiality to reduce
burnout: a mixed methods study
among undergraduate medical students
in a non-Western, Asian context

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Abstract

Background

Burnout is a psychological condition induced by work-related chronic interpersonal stressors. Interventions creating a sense of belonging and collegiality have been proposed as approaches for alleviating burnout. The current study aimed to: (1) explore the relationships between burnout, sense of belonging (relatedness with others), and work engagement; and (2) identify the key elements perceived by undergraduate medical students as positively contributing to collegiality, engagement, and a sense of belonging, in an undergraduate medical training setting.

Methods

An exploratory sequential mixed-methods design using questionnaires and semi-structured individual interviews collected quantitative and qualitative data among undergraduate medical students at Mahidol University, Thailand. The Maslach Burnout Inventory-Student Survey questionnaire was used to measure burnout. The Basic Psychological Need Satisfaction at Work Scale (BPNSS-21) and the Utrecht Work Engagement Scale-Student Version (UWESS-9) measured students' basic psychological needs satisfaction at work and work engagement, respectively. Descriptive statistical analysis and confirmatory factor analysis were performed on BPNSS-21 and UWESS-9 data. Spearman's correlation coefficient was used to identify the correlation between burnout and other factors. Twenty undergraduate medical students participated in the qualitative study. Qualitative analysis was conducted iteratively using constant comparison and the standard principles of primary, secondary, and tertiary coding for thematic analysis.

Results

Thai versions of the BPNSS-21 and UWESS-9 showed an acceptable fit for the Thai cultural context. Burnout had significant weak inverse associations with engagement ($r=-0.39$, $p<0.005$) and basic psychological needs satisfaction ($r=-0.37$, $p<0.005$). Sense of belonging had a significant weak inverse relationship with burnout ($r=-0.25$, $p<0.005$). The main themes emerging from qualitative analysis were relevant tasks and learning activities, safety in the learning environment, peer interaction, program design factors, dynamics of collegiality while progressing through medical school, and personal stance and social skills.

Conclusions

Sense of belonging, engagement, and collegiality were related to burnout. The key features for promoting collegiality, the sense of belonging, and engagement were relevant tasks and learning activities, safety in the learning environment, peer interaction, program design factors, dynamics of collegiality while progressing through medical school, and personal stance and social skills.

Background

In 1993, Maslach defined burnout as a psychological condition in response to chronic interpersonal stressors related to work.¹ However, in 2019, the World Health Organization re-defined burnout from a health perspective as a syndrome resulting from chronic and poorly managed workplace stress that is characterized by 1) high emotional exhaustion or feelings of energy depletion, 2) high depersonalization or cynicism related to one's job, and 3) a lack of personal accomplishment or perception of low professional efficacy.²

Previous studies have reported that the prevalence of burnout among medical students ranges between 45 and 71%.³ Although many of these studies have been conducted in Western countries, those originating in non-Western contexts indicate that burnout is a cross-cultural problem.⁴ For example, among undergraduate medical students in Thailand, the prevalence of burnout in three domains (high emotional exhaustion, high depersonalization, and low professional efficacy) combined was 28.4%.⁵ In one study, Srikam et al.⁶ evaluated the level of burnout among residents in Thailand. They reported that 38.8, 52.8, and 40% of the residents experienced emotional exhaustion, depersonalization, and reduced personal accomplishment.

Work engagement is a positive, fulfilling, work-related state of mind, and is considered to be a positive factor for mitigating against burnout. Thus, interventions to promote work engagement may have preventive value against burnout. Work engagement is characterized by vigor, dedication, and work absorption⁷⁻¹¹ and is a component of the domain of the resources in the Job Demands-Resources Model (JD-R). In both Western cultures and Asian cultures, work engagement is inversely correlated with burnout.^{12,13}

Resilience is a crucial factor in promoting work engagement.^{14,15} In 2016, McKenna et al. defined resilience as the ability to bounce back when a person encounters adversity. Social resilience is the ability of a group to tolerate stress adaptively through mutual trust and bonding among its members.¹⁶ Hence, resilience has been proposed as a critical factor in promoting well-being in the workplace.^{17,18} Social resilience can result from connecting members in the workplace with each other, which can also be described as collegiality. According to Maslow's hierarchy of needs, collegiality can fulfill the need for relatedness (belongingness). Belongingness refers to the desire to have a sense of belonging, and entails feeling accepted and valued by others.^{19,20} Alongside resilience, a sense of belonging is also considered to be crucial for promoting work engagement. A sense of belonging occurs when a person is involved in a system or environment in which they perceive themselves to be integral, and comprises (1) the perception of being valued for involvement, feeling accepted, and needed, and (2) a perceived fit between their individual characteristics and the system or environment.²¹ In a study among Korean pharmacy students²², the need for relatedness in psychological needs satisfaction was inversely related to burnout. Therefore, building social connections among colleagues and friends in relation to burnout may be a promising solution for alleviating burnout.

Hence, novel or alternative interventions that create a sense of belonging (being valued and perceived fit) and collegiality have been proposed as approaches for overcoming the disconnection between peers and other professionals in the clinical workplace. These interventions are expected to increase work engagement both in the clinical and pre-clinical setting, and decrease the incidence of burnout. In the Thai undergraduate medical curriculum, the learning environments differ between the clinical years (years 4-6) and the pre-clinical years (years 1-3). In the clinical years, undergraduate medical students are part of smaller groups of 10-25 students rotating in different clinical departments. Their learning environment is more authentic, including working in patients' care teams, which involves interactions with patients, nurses, teachers, senior students, residents, and fellows. In contrast, in the pre-clinical years, students are either part of the full year group (e.g., in a lecture hall) or part of a smaller group of 30 students (e.g., in classroom or laboratory teaching). Thus, for pre-clinical students, social interactions mostly occur among peers and some teachers.

However, key factors that promote a sense of belonging (being valued and perceived fit) and collegiality related to alleviating burnout are still poorly understood, especially from a non-Western, Asian medical students' perspective. Many non-Western medical schools, including those in Asia, have adapted medical curricula from Western medical education frameworks, because social and cultural needs and resources are fundamentally different in Western medical education frameworks, including interactions between peers and staff, societal expectations, motivations, and interests of the faculty staff.^{23,24} In addition, because Asian cultures are generally collectivist, the group's needs and goals are typically valued above the individual's desires. Thus, long-term relationships with group members and supporting the group are crucial for cultural values in collectivist cultural contexts.²⁵ Exploring these aspects among undergraduate medical students is thus essential to guide the design of new interventions to alleviate burnout in medical schools in non-Western, Asian contexts.

To investigate this issue, we examined the following research questions:

1. To what extent is burnout related to a sense of belonging (relatedness with others) and work engagement for undergraduate medical students?
2. What are the key elements that undergraduate medical students perceive as positively or negatively contributing to promoting collegiality, engagement, and a sense of belonging?

Methods

An exploratory sequential mixed-methods design was applied to collect quantitative and qualitative data, using questionnaires and semi-structured individual interviews, respectively. This study was approved by the Ethics Committee of the Faculty of Medicine of Ramathibodi Hospital, Mahidol University.

Quantitative component

Participants and setting

Medical students in years 1-6 at Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, were invited by an education staff member after a plenary lecture to participate in the quantitative component of this study in the last semester of the 2020 academic year. Students that did not want to participate were welcome to leave. The questionnaires were then distributed in a written format. Students handed in completed questionnaires at the desk in front of the lecture hall, ensuring that data were collected confidentially. The research team could not track the data back to individual participants, and only the primary researcher had access to the data. A total of 1160 medical students provided informed consent for data collection. Each participant was able to withdraw from the study at any time, and no incentive was provided for participation.

Questionnaires

Three questionnaires were used, as follows:

1. The Maslach Burnout Inventory-Student Survey Thai version (MBI-SS), a 15-item questionnaire rated using a seven-point Likert scale, with three factors: high emotional exhaustion, high depersonalization, and low professional efficacy.^{5,7,8,26}
2. Basic Psychological Need Satisfaction at Work Scale (BPNSS-21), a 21-item questionnaire, rated with a sevenpoint Likert scale ranging from “not at all true” to “very true,” and three factors: autonomy, competence, and relatedness.²⁷⁻³⁰
3. Utrecht Work Engagement Scale-Student version (UWESS-9), a nine-item questionnaire, using a sevenpoint Likert scale with three factors: vigor, dedication, absorption.³¹⁻³⁶

The BPNSS-21 and UWESS-9 were translated, and their psychometric properties were determined for the Thai context.

Analysis

A descriptive statistical analysis was performed to identify participants' burnout prevalence, basic psychological need satisfaction level, and engagement level. The psychometric properties and confirmatory factor analysis of the BPNSS-21 and UWESS-9 were examined. Psychometric sensitivity evaluation was conducted by measuring central tendency and shape. Items with skew (Sk) and kurtosis (ku) above three, in absolute values, were interpreted as sensitivity problems. The fit indices used for confirmatory factor analysis were the chi-square and degrees of freedom ratio (χ^2/df), standardized root mean squared error (SRMR), comparative fit index (CFI), Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA) (acceptable fit index values are provided in the Appendix 4.A). In addition, confirmatory factor analysis and Spearman's correlation coefficient were performed using AMOS® version 18.0 and SPSS

Statistics for Windows version x.0 (SPSS Inc., Chicago, IL, USA) to identify correlations between the sense of belonging, burnout, engagement, and other factors.

Qualitative component

Participants

In the second part of the study, a purposeful sample of deviant cases from each year was selected. Students with the highest and lowest levels of burnout (in MBI questionnaire scores) were considered as deviant cases. These students were invited to participate in interviews via telephone calls.

Interviews

Semi-structured interviews were used to refine and explore factors that potentially influenced respondents' perspectives regarding the sense of belongingness, engagement, and collegiality, determined on the basis of basic psychological needs satisfaction and engagement literature.^{7-11,19,20,37} Because these are sensitive topics, an individual interview approach was used. The interviews were conducted by a researcher with qualitative interview experience using a semi-structured interview guide to explore medical students' experiences influencing their sense of belonging and collegiality in the clinical workplace or medical school. Particular attention was paid to factors that promote or inhibit the sense of belonging and collegiality among medical students. The interviews took place on site in a private room, and were digitally recorded without labeling of participants or any identifiable information.

Analysis

The qualitative analysis was performed according to the six-step process of thematic analysis³⁸: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing a report by applying the generally accepted principles of open coding, axial coding, and selective coding to the data.³⁸⁻⁴⁰ The data analysis was conducted iteratively while data collection was still in progress to explore new topics and newly mentioned aspects in later interviews. The transcripts from the interviews were analyzed independently by two researchers (PP and WK). In cases of disagreement in interpretation, the authors discussed the results until consensus was reached. The two researchers then independently familiarized themselves with the data, generated initial codes, and reflexively considered the codes together. The preliminary coding scheme was then organized and discussed between the two researchers during the interview process until theoretical data sufficiency, or the point at which no more new information or concepts were added was reached. Searching, reviewing, defining, and naming themes was then performed iteratively, and the authors again discussed themes until agreement was reached. The final report was carefully translated into English.

Reflexivity

In consideration of our individual roles as researchers and the potential influence introduced in collecting, analyzing and interpreting the data, we worked as a multidisciplinary research team to mitigate the influence of positionality. PP was the lead researcher and led the data collection. PP has a background in health professions education science and is a medical teacher, but was not involved in teaching or assessing the students during this study period. Therefore, the power differential in the relationship between teacher and student was limited. WK served as co-researcher and is a medical teacher who also has a background in health professions education sciences. WK had no direct contact with the participants during the data collection period. SH has a biomedical PhD with subsequent training and experience in educational research. JB (also an educationalist) and WvM both have PhDs in medical education. Each of these researchers (SH, WvM, JB) provided independent external medical education and research perspectives on the data and its interpretation. They reviewed examples and counter-examples, supported the thematic analysis, and participated in the scientific writing process to prevent tunnel vision or confirmation distortion. In addition to medical education expertise, WvM and JB are also active physicians, enabling them to consider the results of the study in the context of contemporary clinical healthcare.

Results

Quantitative component

Psychometric properties of the BPNSS -21 (Thai version)

Reliability

Forward-backward translation of the BPNSS-21 indicated a strong degree of agreement, with a kappa value of 0.87. The internal consistency of the questionnaire was good, with a Cronbach's alpha value of 0.85. The Cronbach's alpha coefficient values for autonomy, competence, and relatedness were 0.71, 0.67, and 0.79, respectively. Mean and standard deviation are reported in Table 4.1.

Table 4.1 Means, standard deviations, and Cronbach's indices of internal consistency for the BPNSS-21 and the UWESS-9 (n=743).

Basic Psychological Need Satisfaction at Work Subscales	Mean	SD	Cronbach's alpha
Autonomy (score 7–49)	29.5	5.4	0.71
Competence (score 7–42)	26.1	5.1	0.67
Relatedness (score 7–56)	40.1	6.8	0.79
Overall			0.85
UWESS-9			
Vigor (score 0–18)	9.6	3.8	0.83
Dedication (score 0–18)	10.4	3.7	0.80
Absorption (score 0–18)	9.3	4.1	0.81
Overall			0.93

Confirmatory factor analysis

The confirmatory factor analysis demonstrated acceptable fit indices of the BPNSS (Thai version), which were $\chi^2/df=5.32$, CFI=0.85, TLI=0.79, SRMR=0.078 and RMSEA=0.078.^{41,42} The path diagram with standard factor loadings of the 21-item Thai version of the Basic Psychological Needs Satisfaction at Work exhibited a sufficient fit with the original factor structure (Appendix 4.A: Table S4.1, Figure S4.1 and Table S4.2).

Table 4.2 Participants' baseline characteristics (n=763).

Baseline characteristics	Total	
	n (total)	Response rate (%)
Year		
1 st	45 (211)	21.3%
2 nd	182 (207)	87.9%
3 rd	119 (202)	57.5%
4 th	147 (182)	80.8%
5 th	178 (178)	100%
6 th	92 (180)	51.1%
Grade point average		
2.00-2.49	16	2.1%
2.50-2.99	96	12.9%
3.00-3.49	284	38.1%
>3.49	350	46.9%
Sex (n=757)		
Male	375	49.5%
Female	382	50.5%
Age (years)		
Median (IQR)	21 (IQR2), (range: 19–39)	

The Psychometric properties of the UWESS -9 (Thai version)

Reliability

Forward-backward translation of the UWESS-9 revealed a kappa of 0.84, corresponding to a substantial level of agreement. In addition, the internal consistency of the questionnaire was good, with a Cronbach's alpha value of 0.93. Mean, standard deviation, and Cronbach's indices of internal consistency of subscales are reported in Table 4.1.

Confirmatory factor analysis

Confirmatory factor analysis demonstrated acceptable fit indices of the UWESS-9 Thai version by most of the fit indices: CFI=0.93 TLI=0.89, and SRMR=0.05. χ^2/df and RMSEA showed a moderate fit of the model in the Thai context. Further adjustment of some items in the questionnaire might result in a better fit (Appendix 4.A, Table S4.2).

The path diagram with standard factor loadings of the Thai version of the UWESS-9 exhibited a sufficient fit with the original factor structure (Appendix 4.A: Table S4.2, Table S4.3 and Figure S4.2).

Demographic characteristics of the participants

Of the invited 1160 students, 763 (response rate 65.8% [49.5% male]) participated in the study. The participants' demographic characteristics are shown in Tables 4.2 and 4.3.

The Thai version of the MBI-SS questionnaire was previously validated and reported to have a good fit and reliability in the Thai context.⁵ After excluding missing data and extreme responses from data analysis, 709 participants remained.

Table 4.3 Number of students with an indicator of burnout (n=709).

Burnout (MBI-SS)	n=709	Percentage
Overall	139	19.6%
Personal efficacy		
High	204	28.0%
Moderate	230	31.6%
Low	295	40.5%
Emotional exhaustion		
Low	178	24.0%
Moderate	179	24.2%
High	384	51.8%
Depersonalization		
Low	49	6.7%
Moderate	236	32.1%
High	451	61.3%

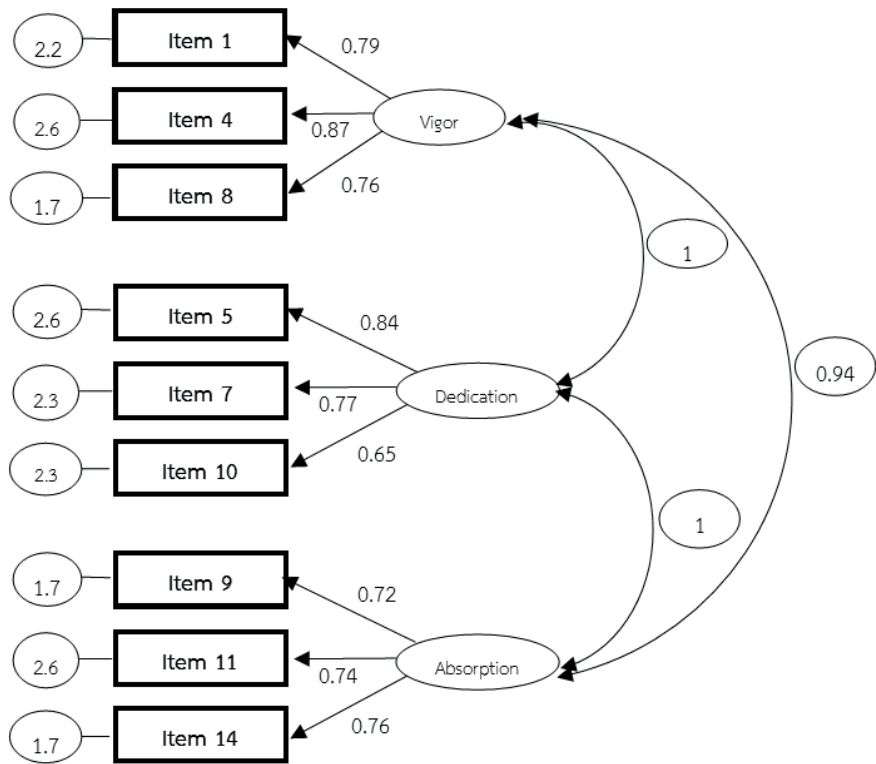


Figure 4.2 Path diagram with standard factor loadings of the Thai version of the Utrecht Work engagement scale-student version 9-item (n=743).

Association between engagement, basic psychological needs satisfaction, and burnout

Age, level of training, grade point average, and sex were not significantly associated with burnout level and subscales. This study found that burnout had a weak significant inverse association with engagement ($r=-0.39$, $p<0.005$) and basic psychological needs satisfaction ($r=-0.37$, $p<0.005$). Students with an indicator of burnout had lower engagement and basic psychological needs satisfaction. In addition, relatedness with other (sense of belonging), which is one of the BPNSS subscales, shows a significant weak inverse relationship with burnout ($r=-0.25$, $p<0.005$). Professional efficacy, one of the burnout subscales, also had a higher correlation with engagement ($r=-0.52$, $p<0.005$) (Table 4.4). Engagement and basic psychological needs satisfaction were also significantly correlated ($r=0.51$, $p<0.05$, Table 4.5) and between subscales. Autonomy and competence exhibited a significant moderate correlation with engagement, and a stronger correlation than that between autonomy and relatedness.

In conclusion, burnout exhibited a weak but significant correlation with both the sense of belonging (relatedness with others) and work engagement among Thai undergraduate medical students.

Table 4.4 Correlations between burnout, engagement and basic psychological needs satisfaction, and their subscales.

Variables		Burnout (MBI-SS)			
		Overall	Low professional efficacy	High emotional exhaustion	High depersonalization
UWESS-9	Overall	-0.39	-0.52	-0.35	-0.35
	Vigor	-0.39	-0.47	-0.35	-0.32
	Dedication	-0.36	-0.56	-0.32	-0.37
	Absorption	-0.41	-0.44	-0.30	-0.29
BPNSS-21	Overall	-0.37	-0.40	-0.38	-0.39
	Autonomy	-0.32	-0.32	-0.38	-0.30
	Competence	-0.38	-0.46	-0.39	-0.38
	Relatedness	-0.25	-0.28	-0.24	-0.30

All variables, p-value <0.005.

Table 4.5 Correlation between engagement and basic psychological needs satisfaction.

Variables/correlation		UWESS-9				BPNSS-21			
		Vigor	Dedication	Absorption	Overall	Autonomy	Competence	Relatedness	Overall
UWESS-9	Vigor	1							
	Dedication	0.81	1						
	Absorption	0.79	0.80	1					
	Overall	0.93	0.93	0.93	1				
BPNSS-21	Autonomy	0.43	0.46	0.39	0.46	1			
	Competence	0.45	0.54	0.48	0.53	0.61	1		
	Relatedness	0.30	0.37	0.23	0.32	0.56	0.51	1	
	Overall	0.46	0.54	0.43	0.51	0.85	0.81	0.86	1

All variables, p value <0.005.

Qualitative component

Ten undergraduate medical students from pre-clinical years (70% male) and 10 students from clinical years (90% male), with signs of burnout (nine students, 89% male) and without signs of burnout, were invited to participate in the second part of the study. The key elements that were perceived as contributing (positively and negatively) to promoting collegiality, engagement, and a sense of belonging were explored. The main themes that emerged from the analysis were relevant tasks and learning activities, safety in the learning environment, peer interaction, program design factors, dynamics of collegiality while progressing through medical school, and personal stance and social skills. There was no difference in the themes identified for the students with signs of burnout versus those without signs of burnout. In the following sections, these themes will be consecutively discussed in depth.

Elements in the learning environment that were reported to be necessary for a sense of belonging were tasks, safety, and teachers, which were intertwined with program design factors. Students indicated that when these elements were perceived as helpful and supportive, this led to a perception of trust and feeling competent, strengthening the sense of belonging to the medical school and institute. These factors will be consecutively discussed in the sections below.

Relevant tasks and learning activities

How students perceived the learning activities and tasks offered as part of the curriculum was also an essential element of a good perceived fit, as well as feeling valued and engaged.

In the pre-clinical years, tasks that benefited their team and peers were perceived as meaningful for integration with the medical school community. These could also be extra-curricular tasks.

"I felt valuable to the faculty and my team when I contributed to an open house activity. I was responsible for sharing my experience as a medical student with secondary school students and parents. My team got really nice feedback about the usefulness of my contribution." (ID17, pre-clinical year, no indicators of burnout).

Among students in the clinical years, tasks related to genuine patient care and authentic tasks directly benefiting patients were perceived as meaningful and increased the sense of belongingness and engagement. Participants described "meaningless tasks" as non-physician tasks, which they perceived as not being directly related to patient encounters or care, such as completion of a long record form, which was known to be discarded after patient discharge from the hospital. When students were allowed more autonomy in their clinical work, this led them to feel trusted and competent. In addition, they felt more connected to the team:

"I detected a depressive mood in one of my patients and the resident trusted me, and assigned me to talk with my patient. I felt that my role was meaningful and that I belonged with the team." (ID6, pre-clinical year, no indicators of burnout).

"At the affiliated hospital where I was allowed to perform real physician tasks under supervision, I felt more competence and learned more." (ID5, clinical year, exhibited indicators of burnout).

However, it was also evident that tasks or assignments were sometimes perceived as meaningless or not constructively aligned. In such cases, suboptimal program design prevented students from having a sense of belonging. Notably, elements related to a

sense of belonging were often connected to being part of the team, which was related to the perception of collegiality.

Safety in the learning environment

Because the context differed between pre-clinical and clinical years, the key elements identified as being related to promoting collegiality and a sense of belonging were therefore consecutively discussed separately for the clinical years and pre-clinical years.

The clinical year learning environment

Feeling safe in the learning environment was an essential contributory element for the sense of belonging. It was particularly evident in the clinical workplace but was also reported for the pre-clinical years. In the clinical workplace, receiving constructive feedback, feeling respected and being part of the clinical team promoted the feeling of safety and sense of belonging.

"I felt valued in the team following a situation in which a patient and his family got financial support from the institution foundation with medical care team assistance. The family appreciated the team, and also respected me I felt capable of helping the patient and the family." (ID9, pre-clinical year, no indicators of burnout).

The role of the teacher was considered to be particularly important for creating a safe learning environment. In addition to their actual presence and interactions, their teaching skills were crucial in creating a sense of belonging. Teachers who were able to create meaningful tasks (as described above), exhibit genuine engagement, and use constructively aligned teaching activities and techniques such as thinking aloud, also contributed to a sense of belonging to the medical program or institute.

"Residents asked me to think aloud and waited for my answer rather than hurrying to finish the care plan. I understood and learned a lot more and it engaged me. When a teacher taught other topics that were not related to my real patients, I disengaged. Nevertheless, if it was related to my real patients, I would be engaged." (ID6, preclinical year, no indicators of burnout).

In contrast, particularly among students in the clinical years, belittlement, a lack of interaction, and negative remarks caused students to feel a sense of disconnection regarding perceived fit and being valued, and their sense of belonging. Consequently, they felt disconnected from the team:

"During the bedside teaching round, if the patients were not directly assigned to my responsibility, I would not care. I would step back behind my friends and let

them present their cases to the teacher. They were my shield, and protected me from being belittled by teachers or residents. I wanted to detach from the patient care team when I felt insecure in my knowledge, because I knew that residents or teachers would belittle me.” (ID1, clinical year, exhibited indicators of burnout).

Pre-clinical year learning environment

Although interactions with teachers in the pre-clinical years was less intense, with more plenary teaching formats, meaningful one-on-one interactions between student and teacher created a sense of belonging and feeling supported. In addition, in the pre-clinical setting, interactions with peers felt more critical for a sense of belonging to the medical program and institute.

“In pre-clinical year extra-curricular activities, a teacher listened to my opinion and showed openness to new ideas. I felt engaged in the activities and had a sense of belonging to the medical school. Openness to new ideas is part of the culture of the faculty.” (ID17, pre-clinical year, no indicators of burnout).

“I felt like I belonged at my institution because I met new people with shared values who supported each other, as well as experiencing a positive learning environment in which the students shared common characteristics.” (ID11, pre-clinical year, no indicators of burnout).

Program design factors

Program design factors emerged as an important interface with the tasks, safety of the learning environment, and the teacher as elements in building a sense of belonging. In addition, busy or conflicting schedules were mentioned as interfering with a sense of belonging to a group of friends, the peer group, or the team at the clinical workplace.

“I felt closer to my friends who spent more time with me in extra-curricular activities. However, they were unable to join the same activities as me, because our overcrowded curriculum did not give us enough time. .. Some days I had no collaboration or e-lecture learning all day. I could feel a distance between friends because we talked less and knew little about each other’s lives.” (ID7, pre-clinical year, having indicators of burnout).

Although the mentoring support system was appreciated and led to a sense of belonging in some cases, the organizational structure needed to be correct and fit-for-purpose.

“When I felt down or blue, I tried to seek mental health support at the hospital, but I couldn’t access help. The activities of the mental health group support for medical students were good, but space was very limited. I wanted to join the

activities, but I wasn't able to access them." (ID16, pre-clinical year, no indicators of burnout).

Maintaining or forming peer group relationships was reported to lead to perceived collegiality. Program design factors such as busy time schedules were sometimes reported to interfere with maintaining and forming peer groups, and an inability to connect with the established peer group and a lack of support could lead to a loss of perceived collegiality.

"In year 3, I had problems with some friends in my group (from the first year), and I left my group because I felt uncomfortable hanging out with them. I tried to join other groups, but I could not catch up with their interests or conversations. It was challenging, and I had no support." (ID16, pre-clinical year, no indicators of burnout).

Dynamics of collegiality while progressing through medical school

As indicated above, a central theme in feeling a sense of belonging was feeling like part of a team and appreciating peers and staff as colleagues. As perceived by medical students, the analysis showed that collegiality had a dynamic nature during the medical training program, from being a novice first-year student to being a pre-clinical then a clinical student, and when facing unexpected events. In the pre-clinical years, most of the learning activities of all students were jointly scheduled in the same department and at the same time, such as on-site lectures and small group discussions, which allowed daytoday contact amongst peers. In addition, there were extra-curricular activities that strengthened teamwork. In the clinical years, medical students rotated to different departments or hospitals, and had to work with a new group of peers and shared responsibility for patient care or learning assignments. Students then had less contact time with their friends from pre-clinical years, but more contact time with teachers or seniors in clinical workplaces. In addition to the shift in the types of contact, increased time pressure, busy clinical settings, and increased responsibilities meant that students had less time available for non-university activities with peer groups. When peers took responsibility for each other and helped out, there was a strong sense of collegiality and belonging.

"In a clinical clerkship, friends in my group supported each other. We reminded each other to complete medical documents, notified each other when the laboratory results of patients were reported, and communicated all the time about group work and individual assignments. Also, we went everywhere together and made sure no one was left behind or missed anything" (ID13, pre-clinical, no indicators of burnout).

Personal stance and social skills

Personal stance and ability to be active in teamwork were needed for practical working relationships and experiencing collegiality. A possible mismatch in expectations was not always communicated and could lead to problems in peer relationships or disengagement when a sense of belonging to the group was not perceived.

"I came from a secondary school that emphasized selfstudy and group discussion, but my friends from (another) Thai secondary school preferred to read quietly with the group. It was not my style, and I thought I disturbed their study when we studied together. Later on, I studied alone or only with friends from the same secondary school." (ID7, pre-clinical year, no indicators of burnout).

Discussion

The findings related to the two research questions are discussed consecutively below, in accord with the exploratory sequential mixed-method approach applied. Regarding the first research question (determining the extent to which burnout is related to the sense of belonging [relatedness with others] and work engagement among undergraduate medical students), the current results revealed a significant weak correlation between burnout and both the sense of belonging (relatedness with others) and work engagement among Thai undergraduate medical students. The results revealed that undergraduate medical students who engaged more with their learning environment and their peers had a lower risk of burnout. Recently however, a systematic review on the impact of peer support provided inconclusive evidence for the effectiveness of interventions on student well-being.⁴³ However, the current findings are in accord with a similar finding in a previous study⁴⁴ among PhD students in medicine, in which the frustration of the basic psychological needs of autonomy, competence, and relatedness with others constituted the essential variables that led to burnout. In conclusion, our study revealed that all subscales of basic psychological needs satisfaction, including perceiving a high level of autonomy, competence, and relatedness with others, were associated with a lower likelihood of having an indicator of burnout. This finding is in line with basic psychological need satisfaction theory, as a critical factor in achieving better well-being.^{45,46} Thus, promoting basic psychological needs satisfaction may be beneficial for preventing burnout.

This current study also revealed evidence of an inverse relationship between engagement and burnout among postgraduate medical students. Thus, those who had a higher level of engagement with a medical school or workplace were less likely to exhibit a burnout indicator, in accord with previous findings in Western and Eastern medical students.⁴⁷⁻⁴⁹ Regarding the relationship between basic psychological need satisfaction and engagement, the quantitative component of this study revealed that medical

students who had a higher level of basic psychological needs satisfaction and subscales, namely autonomy, competence, and relatedness with others, had a higher level of engagement with the medical school. In addition, students who had higher levels of autonomy and competence had higher engagement levels compared with students who had a high level of relatedness with others. This finding is in accord with the results of previous studies of university students in Malaysia⁵⁰ and medical students in Korea.⁵¹ The evidence from this study in the Thai context is similar to those of previous studies reporting that burnout is inversely related to the fulfillment of basic psychological needs and engagement.^{52,53} These findings suggest that medical schools should design curricula that engage students and fulfill their basic psychological needs.

The second aim of this sequential mixed methods study was to clarify the key elements that contribute to promoting collegiality, engagement, and the sense of belonging, from the perspective of undergraduate medical students. The results indicated that the learning tasks and extracurricular activities relevant to medical students were crucial for engaging them. Perceived personal relevance and a meaningful connection to the individual are known to stimulate motivation and energize learning.⁵⁴ In addition, learning environments that are targeted more toward education rather than health services are reported to increase motivation and avoid a feeling of being abandoned among students.^{55,56} The current study identified several other factors that strongly affected engagement and collegiality: the psychological safety of the learning environment in both the classroom and clinical workplaces, and among peers, teachers, seniors, and other health professionals. This result is in accord with previous findings reported in the literature.⁵⁷ The learning environment is reported to be an important context, with psychosocial and material dimensions.⁵⁷ The psychosocial dimension of the framework included the individual interacting with others and social relationships with others, such as having a good community of peers and a good relationship with staff, including receiving constructive feedback, understanding the clarity of expectations, and gaining trust from patients. Students' perception of learning environment components encompassed empathy, burnout, and quality of life,⁵⁷ and students' learning occurred when they were invited and involved in the learning environment.⁵⁸ Moreover, teacher-student relationships play a crucial role in low-stakes assessments, which stimulate self-regulated learning. Teachers could be made aware of their impact and strive for approachability and meaningful interaction, which could potentially have a positive impact on students' perceptions of learning assessments. Therefore, medical teachers and program directors should emphasize the promotion of a positive learning environment to foster students' learning, engagement, collegiality, and well-being.⁵⁹

In addition to the findings described above, students reported the need for a sense of social competence to build positive peer relationships and collegiality. Social awareness and relationship management skills are considered to be essential components of social competence, and have been reported to be positively associated with enhancing teamwork and leadership skills, stress management, physician wellness, and alleviating

burnout.⁵⁹⁻⁶² Thus, promoting social competence among students should be emphasized to foster collegiality, as well as promoting students' wellness and alleviating burnout.

The burnout rate found in this study was 19.6%, which was lower than that reported in a previous study (28.4%) conducted in 2016 in the same medical program. This could be the result of the renewal of student support systems and increased awareness of the problem of burnout in the institution.

Furthermore, in this study, the BPNSS-21 was translated and tested for content validity and reliability in the Thai language. The BPNSS-21 was designed to address psychological need satisfaction at work. It has been used widely,²⁷⁻³⁰ and has evolved and changed since its first use in 1992.³⁰ This scale has been validated in many languages and used worldwide in family environments, workplaces, and higher education contexts.²⁷ The results of the current study indicated that the BPNSS-21 had good psychometric properties among Thai undergraduate medical students.

The UWESS-9 questionnaire was used to measure the level of engagement. The UWESS-9 has been adapted for use in various countries, including Finland,³³ Japan,³⁴ Portugal,³⁵ South Africa,³⁶ and Russia,⁶³ and has been validated with physicians, nurses, paramedics, and medical students. In the current study, the UWESS-9 was tested for psychometric properties and showed good reliability and moderate fit with the original version in the Thai context. These two questionnaires are examples of scales that were developed in a Western context but can be generalized for use in an Eastern context. Thus, other psychological questionnaires could potentially be adapted to in Eastern context.

Future perspectives

Our findings suggest that it is important for medical schools to explicitly establish strategies to enhance a sense of belonging, engagement, and collegiality from the first year through to the last year. From the qualitative insights of the current study, program design was an essential component to give students the opportunity to build collegiality, and to promote engagement by creating positive learning environments. Participatory strategies may be effective approaches for the design of learning environments in which multiple stakeholders, such as students, teachers, nurses, post-graduate medical trainees, and educational leaders are involved, combining various viewpoints.^{64,65} In addition, the design process should consider ways of enabling medical students to encounter meaningful tasks, eliminating unnecessary non-physician tasks, and matching the level of difficulty of the tasks with the level of medical students' ability, which could promote the relevance of the learning activities for them. In addition, avoiding overcrowded curricula should be considered to provide more time and space for teamwork development and social skill development activities. Faculty development programs and resident as teacher programs should also be reconsidered to create a safe learning environment and a culture of psychological safety in medical schools. Medical schools should consider a participatory program revision to promote the sense of belonging, engagement, and collegiality. In addition, the dynamics of collegiality while

progressing through medical school should be taken into account during such revision to alleviate burnout. Implementation of such a revised program and examination of its effectiveness in alleviating medical students' burnout should be the focus of future research.

Strengths and limitations

We believe that the current findings can be generalized to other medical schools in which the curriculum consists of both pre-clinical and clinical levels, and could be applied to enhance student well-being programs. A general limitation of this study was that the response rate per year varied between 21.3 and 100%. This relatively low response rate may have impacted the results of the quantitative data analysis. Consequently, the results may not fully represent the perceptions of first-year medical students.

Conclusion

The current study revealed that the BPNSS-21 and UWESS-9 (Thai version) questionnaires can be used in the Thai cultural context. This result has important implications for the use of these questionnaires across cultural contexts. Second, the current findings indicated that a sense of belonging, engagement, and collegiality are important factors related to burnout. Thus, enhancing students' autonomy, competence, relatedness, and engagement with the learning environment and peers has the potential to alleviate the problem of burnout in students. Finally, the current study identified a number of key features that could be used to promote collegiality and the sense of belonging and engagement: relevant tasks and learning activities, safety in the learning environment, peer interaction, certain program design factors, and dynamics of collegiality while progressing through medical school, as well as personal stance and social skills.

References

1. Maslach C. Burnout: a multidimensional perspective. In: Schaufeli WB, Maslach C, Marek T, editors. *Professional burnout: recent developments in theory and research*. Washington, DC: Taylor & Francis; 1993:19–32.
2. WHO International Classification of Diseases. 2019. https://www.who.int/mental_health/evidence/burn-out/en/ Accessed 2 Aug 2021.
3. Ishak W, Nikravesh R, Lederer S, Perry R, Ogunyemi D, Bernstein C. Burnout in medical students: a systematic review. *Clin Teach*. 2013;10(4):242–5.
4. Chunming WM, Harrison R, MacIntyre R, Travaglia J, Balasooriya C. Burnout in medical students: a systematic review of experiences in Chinese medical schools. *BMC Med Educ*. 2017;17(1):217.
5. Puranitee P, Saetang S, Sumrithe S, Busari JO, van Mook WNKA, Heeneman S. Exploring burnout and depression of Thai medical students: the psychometric properties of the Maslach burnout inventory. *Int J Med Educ*. 2019;10:223–9.
6. Srikam S, Jiamjarasrangsri W, Lalitanantpong D. Job burnout and related factors among residents of King Chulalongkorn Memorial Hospital. *J Psychiatr Assoc Thailand*. 2014;59(2):139–50.
7. Schaufeli WB, Martinez IM, Pinto AM, Salanova M, Bakker AB. Burnout and engagement in university students: a cross-nation study. *J Cross-Cult Psychol*. 2022;3(5):464–81.
8. Schaufeli WB, Salanova M, González-Romá V, Bakker AB. The measurement of engagement and burnout and: a confirmative analytic approach. *J Happiness Stud*. 2022;3:71–92.
9. Bakker AB. An evidence-based model of work engagement. *Curr Dir Psychol Sci*. 2011;20(4):265–9.
10. Bakker AB, Demerouti E. The job demands-resources model: state of the art. *J Manag Psychol*. 2007;22(3):309–28.
11. Bakker AB, Demerouti E. Job demands–resources theory. In: Chen PY, Cooper CL, editors. *Work and well-being: a complete reference guide*. New York: Wiley; 2014:1–28.
12. Agarwal G, Mosquera M, Ring M, Victorson D. Work engagement in medical students: an exploratory analysis of the relationship between engagement, burnout, perceived stress, lifestyle factors, and medical student attitudes. *Med Teach*. 2020;42(3):299–305.
13. Liu H, Yansane AI, Zhang Y, Fu H, Hong N, Kalenderian E. Burnout and study engagement among medical students at Sun Yat-sen University, China: a cross-sectional study. *Medicine*. 2018;97(15):e0326.
14. Othman N, MohdNasurdin AM. Work engagement of Malaysian nurses: exploring the impact of hope and resilience. *World Acad Sci Eng Technol*. 2011;60:1702–6.
15. Kašpárková L, Vaculíka M, Procházka J, Schaufeli WB. Why resilient workers perform better: the roles of job satisfaction and work engagement. *J Workplace Behav Health*. 2018;33(1):43–62.
16. Howe A, Smajdor A, Stöckl A. Towards an understanding of resilience and its relevance to medical training. *Med Educ*. 2012;46:349356.
17. Moon I, Park SK, Jung J. Effects of resilience on work engagement and burnout of clinical nurses. *J Korean Acad Nurs Adm*. 2013;19:525–35.
18. McKenna KM, Hashimoto DA, Maguire MS, Bynum WE. The missing link: connection is the key to resilience in medical education. *Acad Med*. 2016;91(9):1197–9.
19. Maslow AH. A theory of human motivation. *Psychol Rev*. 1943;50(4):370–96.
20. Maslow AH. *Motivation and personality*. New York: Harper and Row; 1954.
21. Hagerty BM, Lynch-Sauer J, Patusky KL, Bouwsema M, Collier P. Sense of belonging: a vital mental health concept. *Arch Psychiatr Nurs*. 1992;6(3):172–7.
22. Cho E, Jeon S. The role of empathy and psychological need satisfaction in pharmacy students' burnout and well-being. *BMC Med Educ*. 2019;19(1):43.
23. Lam TP, Lam YYB. Medical education reform: the Asian experience. *Acad Med*. 2009;84:1313–7.
24. Shamim MS, Baig L, Torda A, Balasooriya C. Culture and ethics in medical education: the Asian perspective. *J Pak Med Assoc*. 2018;68(3):444–6.
25. Chandratilake M, McAleer S, Gibson J. Cultural similarities and differences in medical professionalism: a multi-region study. *Med Educ*. 2012;46:257–66.
26. Maslach C, Jackson SE, Leiter MP. *Maslach burnout inventory manual*. 3rd ed. California: Consulting Psychologists Press; 1996.

27. Macakova V, Wood C. The relationship between academic achievement, self-efficacy, implicit theories and basic psychological needs satisfaction among university students. *Stud High Educ.* 2020;47: 259-691.
28. Deci EL, Ryan RM, Gagné M, Leone DR, Usunov J, Kornazheva BP. Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country: a cross- cultural study of self-determination. *Personal Soc Psychol Bull.* 2001;27:930-42.
29. Ilardi BC, Leone D, Kasser R, Ryan RM. Employee and supervisor ratings of motivation: main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *J Appl Soc Psychol.* 1993;23:1789-805.
30. Kasser T, Davey J, Ryan RM. Motivation, dependability, and employee supervisor discrepancies in psychiatric vocational rehabilitation settings. *Rehabil Psychol.* 1992;37:175-87.
31. Schaufeli W, Bekker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav.* 2004;25(3):293-315.
32. Balducci C, Fraccaroli F, Schaufeli WB. Psychometric properties of the Italian version of the Utrecht Work Engagement Scale (UWES-9): a cross-cultural analysis. *Eur J Psychol Assess.* 2001;26:143-9.
33. Seppälä P, Mauno S, Feldt T, Hakanen J, Kinnunen U, Tolvanen A, et al. The construct validity of the Utrecht Work Engagement Scale: multi sample and longitudinal evidence. *J Happ Stud.* 2008;10: 459-81.
34. Shimazu A, Schaufeli WB, Kosugi S, Suzuki A, Nashiwa H, Kato A, et al. Work engagement in Japan: validation of the Japanese version of the Utrecht Work Engagement Scale. *Appl Psychol.* 2008;57: 510-23.
35. Sinval J, Paisan S, Queiros C, Maroco J. Brazil-Portugal transcultural adaptation of the UWES-9: internal consistency, dimensionality, and measurement invariance. *Front Psychol.* 2018;9:353.
36. Storm K, Rothmann S. A psychometric analysis of the Utrecht Work Engagement Scale in the South African police service. *SA J Indust Psychol.* 2003;29:62-70.
37. Creswell JW, Plano Clark VL. *Designing and conducting mixed methods research.* Thousand Oaks: Sage; 2007.
38. Kiger ME, Lara Varpio L. Thematic analysis of qualitative data: AMEE Guide No. 131. *Med Teach.* 2020; doi:[https:// doi. org/ 10. 1080/ 01421 59X. 2020.17550 30](https://doi.org/10.1080/0142159X.2020.1755030).
39. Charmaz K. *Constructing grounded theory: a practical guide through qualitative analysis.* London: SAGE publication Ltd.; 2006.
40. Watling CJ, Lingard L. Grounded theory in medical education research: AMEE Guide No. 70. *Med Teach.* 2012;34(10):850-61.
41. MacCallum RC, Browne M, Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods.* 1996;1(2):130-49.
42. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Modeling.* 1999;6(1):1-55.
43. John N, Page O, Martin S, Whittaker P. Impact of peer support on student mental well-being: a systematic review. *Med Ed Publish.* 2018;3:32.
44. Kusurkar RA, van der Burgt SME, Isik U, Mak-van der Vossen M, Wilschut J, Wouters A, et al. Burnout and engagement among PhD students in medicine: the bEeP study. *Perspect Med Educ.* 2021;10: 110-7.
45. Ryan RM, Deci EL. *Self-determination theory: basic psychological needs in motivation, development, and wellness.* New York, NY. London: Guilford Press; 2017.
46. Neufeld A, Malin G. Exploring the relationship between medical student basic psychological need satisfaction, resilience, and well-being: a quantitative study. *BMC Med Educ.* 2019;19:405.
47. Robins TG, Roberts RM, Sarris A. Burnout and engagement in health profession students: the relationships between study demands, study resources and personal resources. *Australas J Organ Psychol.* 2015;8:e1.
48. Morales-Rodríguez FM, Pérez-Mármol JM, Brown T. Education burnout and engagement in occupational therapy undergraduate students and its associated factors. *Front Psychol.* 2019;10:2889.
49. Martos Á, Pérez-Fuentes MDC, Molero MDM, Gázquez JJ, Simón MDM, Barragán AB. Burnout y engagement enestudiantes de Ciencias de la Salud [Burnout and engagement in students of health sciences]. *Eur J Investig Heal Psychol Educ.* 2018;23-36.
50. Benlahcene A, Kaur A, Awang-Hashim R. Basic psychological needs satisfaction and student engagement: the importance of novelty satisfaction. *J Appl Res High Educ.* 2020. [https:// doi. org/ 10. 1108/ JARHE-06-2020-0157](https://doi.org/10.1108/JARHE-06-2020-0157).

51. Yu JH, Chae SJ, Chung YS. Do basic psychological needs affect student engagement in medical school? *Korean J Med Educ*. 2018;30(3):237–41.
52. De Francisco C, Sánchez-Romero EI, Vilchez Conesa MDP, Arce C. Basic psychological needs, burnout and engagement in sport: the mediating role of motivation regulation. *Int J Environ Res Public Health*. 2020;17(14):4941.
53. Ariani DW. Basic psychological needs as predictors of burnout and engagement. *J Psychol Educ Res*. 2019;27(2):51–74.
54. Priniski SJ, Hecht CA, Harackiewicz JM. Making learning personally meaningful: a new framework for relevance research. *J Exp Educ*. 2018;86(1):11-29.
55. Dornan T. Workplace learning. *Perspect Med Educ*. 2012;1:15–23.
56. Deketelaere A, Kelchtermans G, Struyf E, De Leyn P. Disentangling clinical learning experiences: an exploratory study on the dynamic tensions in internship. *Med Educ*. 2006;40:908–15.
57. Gruppen LD, Irby DM, Durning SJ, Maggio LA. Conceptualizing learning environments in the health professions. *Acad Med*. 2019;94(7):969–74.
58. Hägg-Martinell A, Hult H, Henriksson P, Kiessling A. Medical students' opportunities to participate and learn from activities at an internal medicine ward: an ethnographic study. *BMJ Open*. 2017;7(2):e013046.
59. Schut S, van Tartwijk J, Driessen E, van der Vleuten C, Heeneman S. Understanding the influence of teacher–learner relationships on learners' assessment perception. *Adv in Health Sci Educ*. 2020;25:441–56.
60. Lobas JG. Leadership in academic medicine: capabilities and conditions for organizational success. *Am J Med*. 2006;119:617–21.
61. Arora S, Ashrafian H, Davis R, Athanasiou T, Darzi A, Sevdalis N. Emotional intelligence in medicine: a systematic review through the context of the ACGME competencies. *Med Educ*. 2010;44:749–64.
62. Uchino R, Yanagawa F, Weigand B, Orlando JP, Tachovsky TJ, Dave KA, et al. Focus on emotional intelligence in medical education: from problem awareness to system-based solutions. *Int J Acad Med*. 2015;1:9–20.
63. Lovakov AV, Agadullina ER, Schaufeli WB. Psychometric properties of the Russian version of the Utrecht Work Engagement Scale (UWES–9). *Psychol Russ State Art*. 2017;10:145–62.
64. Konings KD, Brand-Gruwel S, JG v M. Towards more powerful learning environments through combining the perspectives of designers, teachers, and students. *Br J Educ Psychol*. 2005;75:645–60.
65. Konings KD, Seidel T, van Merriënboer JG. Participatory design of learning environments: integrating perspectives of students, teachers, and designers. *Instr Sci*. 2014;42:1–9.
66. Wheaton B, Muthén B, Alwin DF, Summers GF. Assessing reliability and stability in panel models. In DR Heise, editor. *Sociological methodology*. San Francisco: Jossey Bass.; 1977:84-136.
67. Byrne BM. *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: basic concepts, applications, and programming*. New York. Lawrence Erlbaum Associates Publishers; 1998.

Appendix 4.A

Table S4.1 Results of the confirmatory factor analysis of the Thai version of the Basic Psychological Need Satisfaction at Work ($n=708$).

Index	Value	Value indicating good fit
Chi-square/degrees of freedom	5.3	<5
RMSEA	0.078	<0.08
CFI	0.85	>0.90
TLI	0.79	>0.80
		>0.95
SRMR	0.078	<0.08

Table S4.2 Standardised coefficients of the relationship between factors and items of the Thai version of the Basic Psychological Need Satisfaction at Work ($n=708$).

	Coefficients	Standard Error	Factor Loadings
Autonomy			
item 1	1	0	0.333
item 5	-1.468	0.229	-0.427
item 8	1.303	0.189	0.442
item 11	-0.572	0.152	-0.184
item 13	1.327	0.191	0.452
item 17	1.832	0.241	0.581
item 20	-1.685	0.235	-0.492
Competence			
item 3	1	0	0.571
item 4	-0.758	0.082	-0.546
item 10	-0.799	0.084	-0.577
item 12	-0.837	0.081	-0.570
item 14	0.825	0.089	0.527
item 19	0.987	0.070	0.573
Relatedness			
item 2	1	0	0.595
item 6	1.170	0.083	0.749
item 7	-1.008	0.140	-0.510
item 4	1.134	0.074	0.711
item 15	1.089	0.088	0.658
item 16	-0.974	0.111	-0.427
item 18	-0.901	0.085	-0.550
item 21	1.049	0.077	0.684

Table S4.3 Results of the confirmatory factor analysis of the Thai version of the Utrecht Work engagement scale-student version 9-item (**n=743**).

Index	Value	Value indicating good fit	Ref
Chi-square/degrees of freedom	15.0	<5	63
RMSEA	0.14	<0.08	38
CFI	0.93	>0.90	39
TLI	0.89	>0.80	63
		>0.95	39,64
SRMR	0.05	<0.08	39

Table S4.4 Standardised coefficients of the relationship between factors and items of the Thai version of the Utrecht Work engagement scale-student version 9-item (**n=743**).

	Coefficients	Standard error	Factor loadings
Vigor			
item 1	1	0	0.788
item 4	1.006	0.039	0.871
item 8	1.024	0.047	0.763
Dedication			
item 5	1	0	0.837
item 7	0.986	0.040	0.768
item 10	0.911	0.046	0.648
Absorption			
item 9	1	0	0.720
item 11	0.886	0.047	0.740
item 14	1.045	0.045	0.762

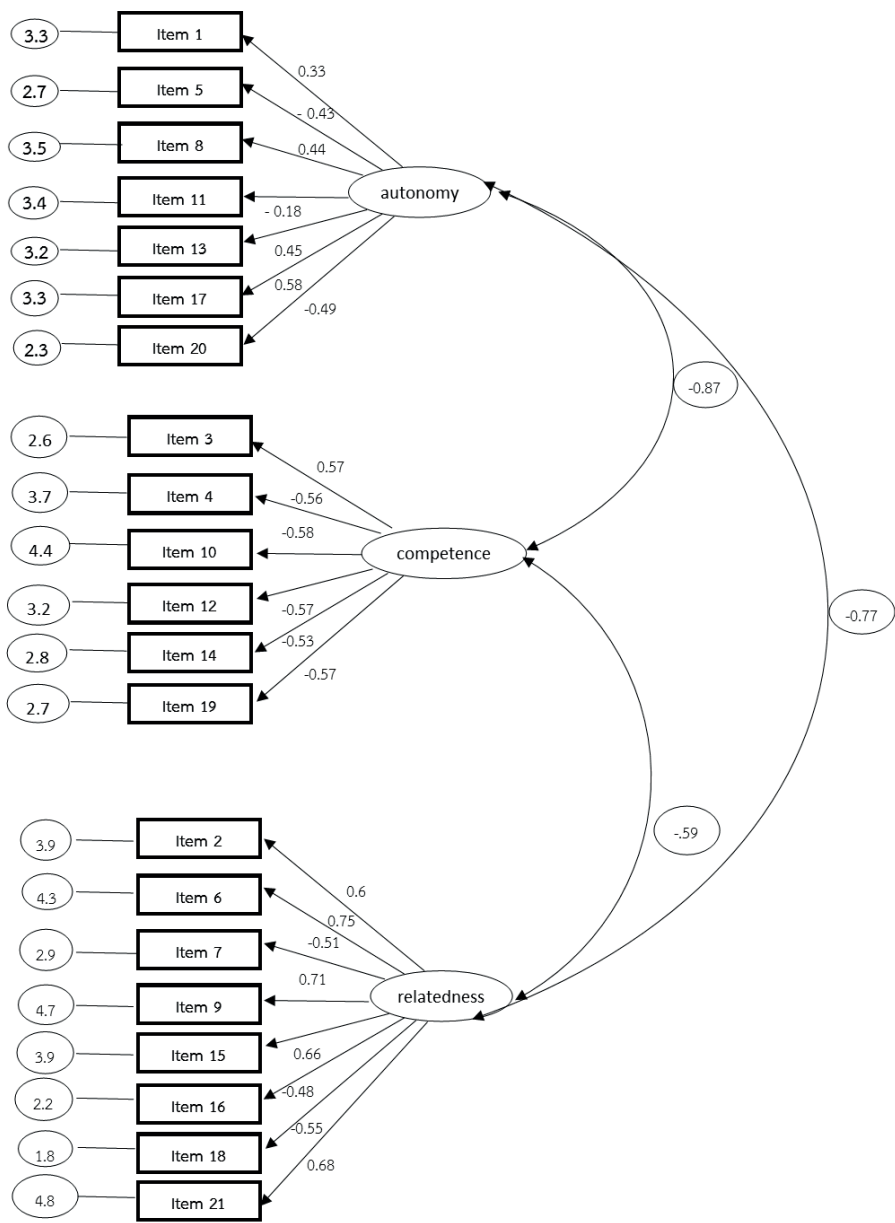


Figure S4.1 Path diagram with standard factor loadings of the 21-item Thai version of the Basic Psychological Need Satisfaction at Work ($n=708$).

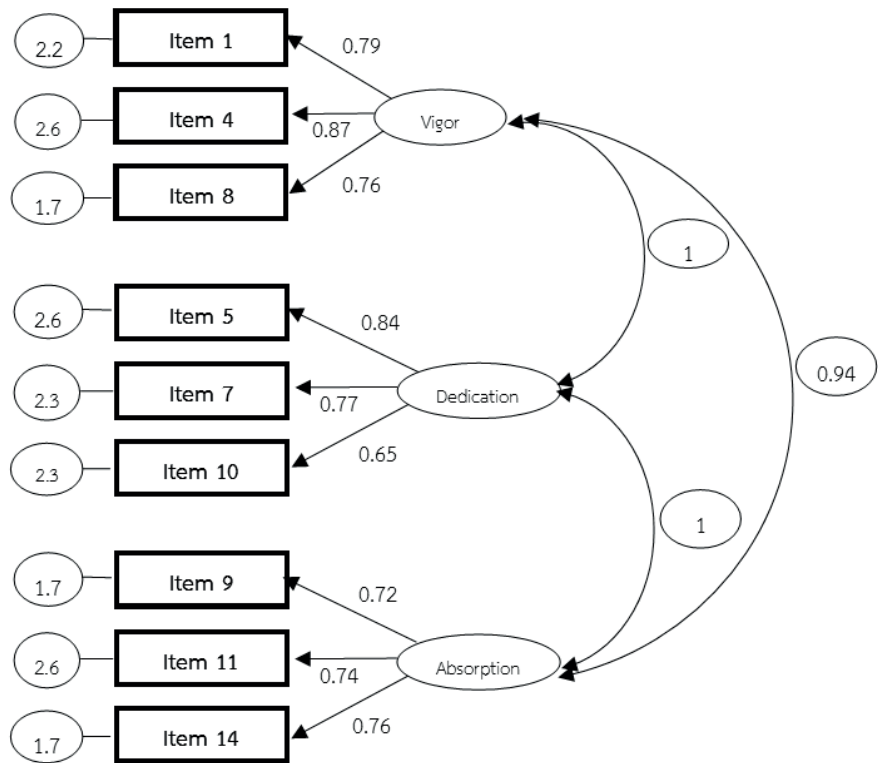


Figure S4.2 Path diagram with standard factor loadings of the Thai version of the Utrecht Work engagement scale-student version 9-item (n=743).

Chapter 5

An exploratory study of the prevalence and reporting of mistreatment and student-related factors among Thai medical students

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Abstract

Background

Mistreatment is a behavior that reflects disrespect for the dignity of others. Mistreatment can be intentional or unintentional, and can interfere with the process of learning and perceived well-being. This study explored the prevalence and characteristics of mistreatment, mistreatment reporting, student-related factors, and consequences among medical students in an Asian context.

Methods

We first developed a Thai version of the Clinical Workplace Learning Negative Acts Questionnaire-Revised (NAQ-R) using a forward-back translation process with quality analysis. The design was a cross-sectional survey study, using the Thai Clinical Workplace Learning NAQ-R, Thai Maslach Burnout Inventory-Student Survey, Thai Patient Health Questionnaire (to assess depression risk), demographic information, mistreatment characteristics, mistreatment reports, related factors, and consequences. Descriptive and correlational analyses using multivariate analysis of variance were conducted.

Results

In total, 681 medical students (52.4% female, 54.6% in the clinical years) completed the surveys (79.1% response rate). The reliability of the Thai Clinical Workplace Learning NAQ-R was high (Cronbach's alpha 0.922), with a high degree of agreement (83.9%). Most participants ($n=510$, 74.5%) reported that they had experienced mistreatment. The most common type of mistreatment was workplace learning-related bullying (67.7%), and the most common source was attending staff or teachers (31.6%). People who mistreated preclinical medical students were most often senior students or peers (25.9%). People who mistreated clinical students were most commonly attending staff (57.5%). Only 56 students (8.2%) reported these instances of mistreatment to others. Students' academic year was significantly related to workplace learning-related bullying ($r=0.261$, $p<0.001$). Depression and burnout risk were significantly associated with person-related bullying (depression: $r=0.20$, $p<0.001$, burnout: $r=0.20$, $p=0.012$). Students who experienced person-related bullying were more often the subject of filed unprofessional behavior reports, concerning conflict or arguments with colleagues, being absent from class or work without reasonable cause, and mistreatment of others.

Conclusions

Mistreatment of medical students was evident in medical school and was related to the risk for depression and burnout, as well as the risk of unprofessional behavior.

Introduction

Mistreatment of medical students was initially recognized by Henry Silver in 1982, who described its similarities to child abuse.¹ In 1991, mistreatment among medical students was identified in a survey and reported to be related to behaviors like public humiliation, taking credit for other's work, being threatened with unfair grades, and pervasive negative comments about career paths.² Mistreatment in the clinical workplace was defined as a situation in which hostile and aggressive actions are systematically directed at one or more students in such a way that they are stigmatized and victimized in a clinical workplace learning environment.³ The Association of American Medical Colleges (AAMC) described mistreatment among medical students as an intentional or unintentional behavior that reflects disrespect for the dignity of others and unreasonably interferes with the process of learning.⁴

Mistreatment in medical school is a widespread problem. In the United States, a landmark study examining the incidence of abuse of medical students in 1990 revealed that 80.6% of senior medical students reported being abused by their elder year students.⁵ This led to the inclusion of a survey for mistreatment in the AAMC's Annual Medical School Graduation Questionnaire in 1991, and annual reporting among graduated medical students⁴. Mistreatment was also reported in a study in 2006, with 85% of medical students reporting experiences of being "harassed or belittled," and 13% describing a severe incident.⁶ A study in 2011 reported that 86% of third-year medical students had experienced at least one incident of mistreatment by either a faculty member or a resident.⁷ In 2014, a pooled prevalence of harassment and discrimination of 59.6% was reported in undergraduate medical training and clerkship (n=30 studies, 26,579 medical students, 95% confidence interval [CI]: 49.2%–68.0%). Verbal harassment was the most common type of abuse.⁸ In other countries, mistreatment among medical students varies between 62.5% (Pakistan), 68.5% (Japan), and 53/7% (Thailand).⁹⁻¹¹ One of the most common categories of mistreatment was person-related bullying, public humiliation, belittlement and verbal abuse, with similar incidences in Western and non-Western contexts.⁵⁻¹³

Previous literature suggests that mistreatment in medical schools was conducted by faculty members, house staff (residents and interns), attending staff, nurses, patients, and other students.⁵⁻¹⁶ Various student-related factors have been associated with mistreatment of medical students, including gender, year of study, grade point average (GPA), and underlying diseases such as psychiatric diseases. The results of previous studies revealed that being male, being a senior student, and having psychiatric problems or a low GPA were correlated with experiencing mistreatment.¹⁷⁻¹⁸ However, these studies did not report on other related factors, such as unprofessional behaviors exhibited by students.

In previous studies in Western countries, mistreatment has been reported to lead to adverse consequences, including elevation of burnout risk, anxiety, depression, alcohol or narcotic abuse, suicide attempts, insufficient confidence in clinical practice,

avoidance, and resignation from healthcare provider roles.^{7,15,19,20-21} Additionally, mistreatment typically leads to stress. Learning and memory can be affected by stress, and this phenomenon is common across different types of students.^{19,22} Although an appropriate (positive) stress level can enhance learning ability²³, a high degree of stress can cause physical and mental health problems²⁴, reduce students' self-esteem²⁵, and affect their academic achievement. Moreover, negative stress among medical students has been associated with anxiety, depression, and suicide.^{15,19-21,26-28} In an Asian context, a study conducted in Singapore reported that about 30% of mistreated students experienced fear or humiliation.¹⁶ In Thailand, a study conducted in 2007 reported that mistreated students experienced unpleasant feelings and burnout that was not related to depression.¹¹ Overall, mistreatment has been reported to influence medical students' well-being in both Western and non-Western contexts. However, to date no study has reported evidence regarding the influence of mistreatment on learning, competency, or professional identity formation in an Asian context.

The social, psychological, and physical factors that affect or are affected by academic activities, are incorporated into the learning environment and determine how students view the support systems at their disposal, their level of learning autonomy, their emotional reactions, and the intrinsic value they place on education.²⁹ In medical students' clinical learning environments, social, psychological, and physical interactions typically involve faculty members, nurses, residents, fellows, and other healthcare workers. These staff members are stakeholders who influence the risk of mistreatment or disrespect experienced by medical students.³⁰ In the hierarchical culture of some hospitals, disrespectful behavior and mistreatment in clinical settings may be tolerated or reinforced.³¹ The culture in medical school plays an important role in the mistreatment of students in such hierarchies, sometimes involving self-sacrifice of students to maximize patient outcomes.³²

Identifying mistreatment, reporting, and the actions of bystanders are important for its appropriate management. In a previous study, barriers to identifying and reporting mistreatment included hierarchy, self-sacrifice, resilience, and reverence, as students feared being labeled a "troublemaker" and harming their careers.³³ A study in a Western context identified various barriers to effective reporting systems, which included students' perception that medical culture includes mistreatment, incidents being considered not being sufficiently important to report, the notion that speaking up might damage student-teacher relationships, reporting processes being too troublesome, and empathy for the person who inflicted the mistreatment.³² Asian cultures are different from Western contexts, with individuals typically valuing the group's needs and goals above their own desires.^{34,35} Therefore, the ways in which medical students are mistreated, their awareness of mistreatment, and systematic approaches to reporting, reviewing, and adjudicating student reports of mistreatment may also differ between Asian and Western contexts.

The AAMC and the American Medical Association (AMA) identified important aspects of student mistreatment that require further research to develop approaches for managing this issue effectively.⁴ Thus, it is necessary to elucidate the prevalence, recurrence, and reporting of mistreatment, the assessment of alleged mistreatment, and the identification of interventions after mistreatment. Unfortunately, few studies have examined these issues in non-Western contexts.

Overall, research on the relationship between mistreatment, well-being, and unprofessional behavior in non-Western contexts, including Asian contexts, is thus limited. Exploring undergraduate medical students' experiences of mistreatment and its relationships with various factors, such as well-being, is essential for identifying and managing this issue. Elucidating these issues could guide the design of new approaches for eradicating mistreatment in medical schools in Asian contexts. The current study consequently aimed to explore the prevalence, recurrence, categories, and reporting actions, targets of mistreatment, related behavior, and well-being among medical students in an Asian context.

Methods

This study used a descriptive cross-sectional design.

Settings and subjects

Medical students studying at the Faculty of Medicine at Ramathibodi Hospital, Mahidol University between years 1 and 6 (N=1,215) in 2021 were invited to participate in a survey using convenience sampling. All participants provided informed consent before completing the survey. Participants with incomplete or extreme responses were excluded.

Instruments and data collection

The survey and informed consent form were provided to all participants via Google Forms. The questionnaire comprised three parts; 1) participants' demographic characteristics, 2) mistreatment prevalence and reporting actions, and 3) student-related factors.

1) Participants' demographic characteristics

The first part of the questionnaire collected demographic data, including age, sex, current year of study, GPA, and underlying diseases (including psychiatric diseases).

2) *Mistreatment prevalence and reporting actions*

The Negative Acts Questionnaire–Revised (NAQ-R), was originally used for detecting mistreatment of employees in workplaces, and mistreatment was classified using three categories: workplace learning-related bullying, person-related bullying, and physically intimidating bullying.³⁶ The NAQ-R was later revised by adding two categories (sexual harassment and ethnic harassment) and tested for psychometric features to expand its applicability to health professional students in clinical workplace environments^{3,19}, and subsequently referred to as the Clinical Workplace Learning NAQ-R scale. This scale measures the occurrence and recurrence of mistreatment over the last academic year using five categories (workplace learning-related bullying [WLRB], person-related bullying [PRB], and physically intimidating bullying [PIB], sexual harassment [SH], and ethnic mistreatment [EH]). The reliability estimates for all factors of the NAQ-R scale ranged from 0.79 to 0.94.³

A Thai version of the Clinical Workplace Learning NAQ-R was developed using an established translation process (forward and back translation), then tested for validity and reliability in the current study. The scale was translated from English to Thai, then translated from Thai back to English by two independent experienced translators. The Thai translation was then reviewed by two faculty medical instructors (from the Department of Pediatrics and the Department of Psychiatry). On the basis of the instructors' suggestions, minor cultural adaptation was necessary to suit the Thai context while maintaining the quality of the instrument. Next, three raters (a native English speaker, and two experts in medical education) rated the degree of agreement between the original and back-translated versions. Another three experts in medical education evaluated the content validity and congruency using a rating scale from 1 to 4. Finally, a pilot study was performed among 30 medical students to check for any difficulties in understanding the content and completing the questionnaire.

3) *Student-related factors*

The third part of the survey consisted of self-assessment, covering students' experiences of related factors to mistreatment such as burnout, risk for depression, unprofessional behaviors, and motivation.

A Thai version of the Maslach Burnout Inventory–Student Survey was previously developed and validated, with an acceptable Kappa value of 0.83, and good internal consistency (Cronbach's alpha: 0.80). The Cronbach's alpha coefficient values for emotional exhaustion, depersonalization, and personal accomplishment were 0.89, 0.81, and 0.70 respectively.³⁷

The risk of depression was identified using the Thai version of the Patient Health Questionnaire (PHQ-9). This questionnaire had satisfactory internal consistency (Cronbach's alpha: 0.79) and moderate convergent validity with the Hamilton Rating Scale for Depression ($r=0.56$; $p<0.001$). The categorical algorithm of the PHQ-9 had low

sensitivity (0.53) but very high specificity (0.98) and a high positive likelihood ratio (27.37). Used as a continuous measure, the optimal PHQ-9 cut-off score of 9 showed sensitivity of 0.84, specificity of 0.77, a positive predictive value of 0.21, a negative predictive value of 0.99, and a positive likelihood ratio of 3.71. The area under the curve was 0.89 (standard deviation [SD]: 0.05, 95% CI: 0.85 to 0.92).³⁸

Statistical analysis

Descriptive statistics were used to present participants' demographic data, mistreatment reporting actions, the prevalence of mistreatment, the categories and the person conducting the mistreatment, and student-related factors (burnout, risk of depression, unprofessional behavior, and motivation).

For the Thai version of the Clinical Workplace Learning NAQ-R, interrater reliability (Kappa) was used to identify the extent of agreement. Internal consistency was analyzed to demonstrate the level of reliability and measured with a standardized Cronbach's alpha coefficient. A Cronbach's alpha >0.8 was considered acceptable. Content validity and congruency were summarized using the content validity index for scale (S-CVI) and average congruency percentage (ACP). S-CVI was calculated by summing the content validity for each item, which was measured from the ratio of experts who rated a score of 3 or 4 for each item, divided by the total items. The ACP was calculated by summing the ratio of items that each expert rated as 3 or 4 divided by number of the total experts. S-CVI and ACP values >0.9 were considered acceptable.

Multivariate analysis of variance was used to determine the associations between experiences of mistreatment and each factor. Associations between unprofessionalism and mistreatment were measured and displayed as crude odds ratios (oRs). All results were discussed with all collaborators.

This study was reviewed and approved by the Human Research Ethics Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand (protocol number MURA2020/1768).

Results

Demographic data

The response rate was 79.1%, but only 56.0% of the participants (N=681, 52.4% female) that agreed to participate completed all questionnaires and were included in the analysis. Over half (54.6%) of the participants were clinical medical students (years 4–6) and 31.4% self-reported at least one underlying disease (e.g., allergic rhinitis, atopic dermatitis, asthma, and seborrheic dermatitis). In addition, 8.2% self-reported at least one psychiatric problem (e.g., depression, attention deficit hyperactivity disorder,

anxiety disorder). Age, gender, GPA, smoking and alcohol consumption are shown in Table 5.1.

Table 5.1 Participants' demographic characteristics (N=681).

Baseline characteristics	Total n=681	Total (%)	Clinical medical students (years 4–6) n=372	Clinical medical students (years 4–6) (%)
Age, years				
<19	120	(17.7)	-	-
20–21	202	(29.7)	30	(8.1)
22–23	226	(33.2)	214	(57.7)
24–25	124	(18.2)	122	(32.9)
≥26	8	(1.2)	5	(1.4)
Sex				
Male	320	(47.0)	182	(48.9)
Female	357	(52.4)	187	(50.3)
Non-specified	4	(0.6)	3	(0.8)
Current year in medical school				
Year 1	88/204 (43.1%)	(12.9)	-	-
Year 2	92/211 (43.6)	(13.5)	-	-
Year 3	129/211 (61.1%)	(18.9)	-	-
Year 4	121/222 (54.5)	(17.8)	121/222 (54.5%)	(32.5)
Year 5	117/198 (59.1%)	(17.2)	117/198 (59.1%)	(31.5)
Year 6	134/169 (79.3%)	(19.7)	134/169 (79.3%)	(36.0)
GPA				
<2.50	12		9	(2.4)
2.50–2.79	30	(4.5)	26	(7.1)
2.80–2.99	58	(8.7)	40	(10.8)
3.00–3.24	93	(14.0)	72	(19.5)
3.25–3.59	196	(29.5)	131	(35.5)
≥3.60	276	(41.5)	91	(24.7)
Smoking				
Yes	12	(1.8)	11	(3.0)
No	665	(98.2)	361	(97.0)
Alcohol consumption				
Yes	174	(25.7)	105	(28.3)
No	503	(74.3)	266	(71.7)
Underlying disease(s)				
Yes	214	(31.4)	152	(40.5)
No	467	(68.6)	220	(59.1)
Psychiatric disorder(s)				
Yes	56	(8.2)	33	(8.9)
No	625	(91.8)	339	(91.1)

GPA, grade point average.

Almost one-third (30.1%) of participants self-reported unprofessional behavior such as going to work or class late without reasonable cause. In the clinical phase, the self-reported unprofessional behavior most often mentioned was lack of care or lack of taking responsibility in patient care.

Clinical Workplace Learning NAQ-R (Thai version)

Following minor cultural adaptation to suit the Thai context, the Thai version of the Clinical Workplace Learning NAQ-R revealed satisfactory internal consistency (Cronbach's alpha: 0.922) and a good degree of interrater agreement with the original version (83.9%). The S-CVI and ACP were both 0.91. Therefore, this instrument was considered to be acceptable for data collection.

Mistreatment experienced by medical students

The results of the Thai version of the Clinical Workplace Learning NAQ-R indicated that 74.5% of participants (n=510) had been mistreated at least once in the past year, of which 67.3% were medical students in the clinical phase. Workplace learning-related bullying was the most common mistreatment category (67.7%, Table 5.2), followed by person-related bullying (65%). Detailed results are shown in Figure 5.1.

The mistreatment results revealed that students in the clinical phase had higher mean (SD) scores for the frequency of mistreatment compared with the mean score in all years (Table 5.2).

Table 5.2 Results for mistreatment based on the Thai version of the Clinical Workplace Learning Negative Acts Questionnaire-Revised.

Categories of mistreatment	Total (N=681)			Clinical medical students (n=372)		
	Mean (SD)		Mistreated n (%)	Mean (SD)		Mistreated n (%)
	(range 1–5)			(range 1–5)		
Workplace learning-related bullying	1.70	(0.75)	461 (67.7)	2.06	(0.76)	320 (86.0)
Person-related bullying	1.82	(0.79)	443 (65.1)	2.18	(0.78)	319 (85.8)
Physically intimidating bullying	1.49	(0.69)	283 (41.6)	1.78	(0.75)	245 (65.9)
Sexual harassment	1.29	(0.60)	180 (26.4)	1.46	(0.73)	149 (40.1)
Ethnic harassment	1.14	(0.47)	80 (11.8)	1.22	(0.59)	68 (18.3)

Attending staff or teachers were the primary source of mistreatment experienced by medical students (31.6%) (Table 5.3). The most common source of mistreatment among preclinical medical students was senior students or peers (25.9%) whereas the most common source among clinical students was attending staff (57.5%). The most common way that participants chose to respond when being mistreated was talking with peers or friends (49.6%). The results regarding participants' opinions about the mistreatment situation in terms of faculty revealed that most students (85.3%) believed that the personal character of the person conducting the mistreatment was the cause of the mistreatment of their medical student peers.

Overall, 34.7% of participants reported burnout, with a higher percentage of burnout among students in the clinical phase compared with medical students in the pre-clinical

phase (38.2% vs. 30.4%). In addition, 7.1% of participants exhibited severe depression on the PHQ-9 assessment, with a higher percentage of medical students in the clinical phase exhibiting depression compared with preclinical medical students (7.8% vs. 6.2%).



Figure 5.1 Frequency of workplace learning-related bullying and person-related bullying as rated by medical students.

Mistreatment reporting actions

Only 8.2% of medical students had formally reported a mistreatment event to another person (Table 5.3). The primary recipients of medical students' reports regarding these

events were faculty members (42.9%) and course directors (32.1%). However, only 20% of those who had ever reported an event reported that they were “satisfied or very satisfied” with the reporting process.

Table 5.3 Other results related to mistreatment, participants’ opinion about the mistreatment situation among faculty, consequences (burnout, depression, unprofessionalism, and motivation), and mistreatment reports.

Mistreatment	Total		Clinical medical students	
	n=681	(%)	n=372	(%)
Source of mistreatment				
Attending staff	215	(31.6)	214	(57.5)
Registered nurse(s) or practical nurse(s)	196	(28.8)	191	(51.3)
Resident(s), fellows or other physician(s)	175	(25.7)	173	(46.5)
Senior student(s) or peer(s)	166	(24.4)	86	(23.1)
Lecturer(s)	119	(17.5)	52	(14.0)
Department officer(s)	87	(12.8)	78	(21.0)
Faculty officer(s)	43	(6.3)	36	(9.7)
Patient(s)	41	(6.0)	40	(10.8)
Participants’ responses chose being mistreated				
Talk with peers or friends	338	(49.6)	248	(66.7)
Ignore the situation	175	(25.7)	128	(34.4)
Talk to family members	149	(21.9)	110	(29.6)
Talk to senior students	45	(6.6)	31	(8.3)
Inform professors of the situation	42	(6.2)	34	(9.1)
Talk to someone mistreating directly	29	(4.3)	17	(4.6)
Consult therapists	17	(2.5)	14	(3.8)
Participants’ opinion about the mistreatment event among faculty				
Personal character of the mistreating person	581	(85.3)	326	(87.6)
Work-related stress	398	(58.4)	221	(59.4)
Strict hierarchical system	338	(49.6)	180	(48.4)
Organizational culture that accepts mistreatment	296	(43.5)	157	(42.2)
Lack of mistreatment management policy	283	(41.6)	145	(39.0)
Consequences				
Burnout	236	(34.7)	142	(38.2)
Risk for depression (PHQ-9)				
No	62	(9.1)	40	(10.8)
Mild risk	199	(29.2)	109	(29.3)
Moderate risk	191	(28.1)	95	(25.5)
Severe risk	181	(26.6)	99	(26.6)
Very severe risk	48	(7.1)	29	(7.8)

Table 5.3 (continued)

Mistreatment	Total		Clinical medical students	
	n=681	(%)	n=372	(%)
Unprofessionalism				
Go to work or class late without reasonable cause	205	(30.1)	97	(26.1)
Do not submit work or submit work late	182	(26.7)	113	(30.4)
Do not care or take responsibility in patient care	129	(18.9)	121	(32.5)
Have conflict with peers	121	(17.8)	89	(23.9)
Absent from work or class without reasonable excuse	99	(14.5)	23	(6.2)
Enter untrue information in the medical record or patient report	73	(10.7)	67	(18.0)
Show mistreatment behaviors to another people	71	(10.4)	42	(11.3)
Reported a case untruthfully	35	(5.1)	29	(7.8)
Mistreatment report	56	(8.2)	50	(13.4)
Report to participants' department (n=56)				
Other professor(s)	24	(42.9)	20	(35.7)
Course coordinator	18	(32.1)	17	(30.4)
Medical student council or club	5	(8.9)	4	(7.1)
Department officer(s)	4	(7.1)	4	(7.1)
Student affairs	3	(5.4)	2	(3.6)
Medical education section	3	(5.4)	3	(5.4)
Satisfaction with reporting the situation (n=54)				
Very satisfied	3	(5.6)	2	(3.7)
Satisfied	8	(14.8)	8	(14.8)
Neutral	22	(40.7)	18	(33.3)
Dissatisfied	14	(25.9)	13	(24.1)
Very dissatisfied	7	(13.0)	7	(13.0)

Association between mistreatment of clinical medical students and medical student-related factors

Age, gender, current year of study, GPA, smoking, alcohol consumption, risk of depression, motivation, and burnout were explored for potential correlations with mistreatment of medical students in the clinical phase using a full model analysis (Table 5.4). The results regarding student-related factors showed that the year of study had a weak positive significant association with workplace-related bullying ($r=0.26$, $p<0.001$), person-related bullying ($r=0.22$, $p<0.001$), physically intimidating bullying ($r=0.19$, $p<0.001$), and sexual harassment ($r=0.16$, $p<0.001$), and a modest significant association with ethnic harassment ($r=0.08$, $p=0.038$). This suggested that students in different years experienced different types and frequencies of mistreatment (Table 5.2).

The risk of depression had modest but significant associations with workplace-related bullying ($r=0.17$, $p<0.001$), person-related bullying ($r=0.20$, $p<0.001$), and physically intimidating bullying ($r=0.13$, $p<0.001$), a moderate significant association with sexual harassment ($r=0.11$, $p=0.001$), and a modest significant association with ethnic harassment ($r=0.07$, $p=0.015$). Therefore, mistreatment was related to the risk of depression.

Age showed a moderate significant association with sexual harassment ($r=0.08$, $p=0.005$), and modest significant associations with person-related bullying ($r=0.007$, $p=0.023$), physically intimidating bullying ($r=0.06$, $p=0.038$), and ethnic harassment ($r=0.05$, $p=0.049$). Students of different ages faced different types and frequencies of mistreatment. Sex (male) had a moderate significant association with sexual harassment ($r=0.20$, $p=0.009$), and a modest significant association with workplace-related bullying ($r=0.17$, $p=0.036$). Motivation had a moderate significant association with person-related bullying ($r=0.17$, $p=0.001$) and a modest significant association with physically intimidating bullying ($r=0.10$, $p=0.044$). Therefore, lack of motivation had negative impacts in some mistreatment categories.

Alcohol consumption had a modest significant association with sexual harassment ($r=0.20$, $p=0.015$), suggesting that students who had a history of drinking alcohol were more likely to experience sexual harassment. Burnout had a modest significant association with person-related bullying ($r=0.20$, $p=0.012$). GPA and smoking did not have significant associations with any mistreatment category.

Correlations between mistreatment and unprofessionalism among medical students in the clinical phase

Features of unprofessional behavior were correlated with mistreatment, such as reporting a patient's case untruthfully, having conflicts or arguments with colleagues, absence from class or work without reasonable cause, and mistreating others (Table 5.5).

Overall, our results indicated that the clinical year level was related to a less safe learning environment for undergraduate medical students compared with pre-clinical years. Medical student-related factors exhibiting a significant association with mistreatment in some categories were the year of study, male gender, alcohol consumption, risk of depression, burnout-related decrease in motivation, and unprofessional behavior.

Table 5.4 Factors related to mistreatment among clinical medical students (n=372).

Factors (n=372)	Workplace learning-related bullying			Person-related bullying			Physically intimidating bullying			Sexual harassment			Ethnic harassment		
	Coef.	(SE)	p	Coef.	(SE)	p	Coef.	(SE)	p	Coef.	(SE)	p	Coef.	(SE)	p
Current year	0.26	(0.06)	<0.001***	0.22	(0.05)	<0.001***	0.19	(0.05)	<0.001***	0.16	(0.05)	<0.001***	0.08	(0.04)	0.038*
Risk for depression (PHQ-9)	0.17	(0.04)	<0.001***	0.20	(0.03)	<0.001***	0.13	(0.03)	<0.001***	0.11	(0.03)	0.001**	0.07	(0.03)	0.015*
Age	-0.06	(0.04)	0.103	0.07	(0.03)	0.023*	0.06	(0.03)	0.038*	0.08	(0.03)	0.005**	0.05	(0.02)	0.049*
Sex (male)	0.17	(0.08)	0.036*	0.11	(0.08)	0.155	0.01	(0.08)	0.950	-0.20	(0.08)	0.009**	-0.06	(0.06)	0.331
Motivation	-0.07	(0.06)	0.186	-0.17	(0.05)	0.001**	-0.10	(0.05)	0.044*	0.02	(0.05)	0.745	-0.04	(0.04)	0.354
Burnout	0.05	(0.08)	0.558	0.20	(0.08)	0.012*	0.13	(0.08)	0.095	0.10	(0.08)	0.195	0.09	(0.06)	0.176
Alcohol consumption	0.02	(0.09)	0.786	0.08	(0.09)	0.342	-0.08	(0.09)	0.342	0.20	(0.08)	0.015*	0.07	(0.07)	0.311
GPA	0.16	(0.11)	0.165	0.01	(0.12)	0.903	0.13	(0.11)	0.233	0.05	(0.11)	0.669	-0.05	(0.09)	0.600
Smoking	-0.10	(0.25)	0.676	-0.32	(0.23)	0.175	<0.01	(0.23)	0.986	0.08	(0.22)	0.708	-0.06	(0.18)	0.732

*** statistically significant at $p<0.001$; ** statistically significant at $p<0.01$; * statistically significant at $p<0.05$. GPA, grade point average; PHQ, Patient Health Questionnaire; SE, standard error.

Table 5.5 Correlations between unprofessionalism and clinical medical students' mistreatment (n=372).

Unprofessionalism (n=372)	Workplace learning- related bullying			Person-related bullying			Physically intimidating bullying			Sexual harassment			Ethnic harassment		
	Crude OR	p	Crude OR	Crude OR	p	Crude OR	Crude OR	p	Crude OR	Crude OR	p	Crude OR	Crude OR	p	Crude OR
Absent from class or work without reasonable cause	1.44	0.191	1.91	1.91	0.021*	1.40	0.217	1.01	0.973	0.60	0.368	0.60	0.368		
Attend class or work late without reasonable cause	1.10	0.529	1.21	1.21	0.224	1.22	0.209	1.09	0.587	0.98	0.910	0.98	0.910		
Faked medical records or patient reports	1.20	0.298	1.04	1.04	0.821	1.08	0.655	1.31	0.110	1.09	0.687	1.09	0.687		
Reported patient's case untruthfully	1.81	0.020*	1.51	1.51	0.099	1.29	0.310	2.36	<0.001***	1.59	0.047*	1.59	0.047*		
Submitted work late	0.84	0.243	1.02	1.02	0.916	0.89	0.456	0.86	0.362	0.70	0.121	0.70	0.121		
Had conflicts with colleagues	1.52	0.009**	1.63	1.63	0.002**	1.16	0.366	1.30	0.095	1.12	0.548	1.12	0.548		
Performed mistreatment behaviors	1.40	0.111	1.54	1.54	0.043*	1.25	0.299	1.35	0.135	1.24	0.371	1.24	0.371		
Inadequate patient care	1.19	0.222	1.15	1.15	0.351	0.94	0.670	1.08	0.627	0.92	0.663	0.92	0.663		

*** statistically significant at $p<0.001$, ** statistically significant at $p<0.01$, * statistically significant at $p<0.05$. OR, odds ratio.

Discussion

The current results revealed that the Thai Clinical Workplace Learning NAQ-R has a high level of reliability, with a Cronbach's alpha value of 0.922, and a high degree of agreement with the original version of the scale (83.9%). The proportion of medical students reporting mistreatment experiences was 74.5%. The most common type of reported mistreatment was workplace learning-related bullying (67.7%) and the most common overall source was attending staff (31.6%). However, the most common sources of mistreatment for preclinical medical students were senior students or peers (25.9%), whereas clinical students most often reported mistreatment by attending staff (57.5%). Surprisingly, only 8.2% of medical students who were mistreated formally reported these mistreatment events to others. The academic year was significantly related to mistreatment, with a higher incidence of mistreatment in the clinical phase learning environment. Risk of depression and burnout were significantly associated with mistreatment categories, such as person-related bullying (depression: $r=0.20$, $p<0.001$, burnout: $r=0.20$, $p=0.012$). Experiences of mistreatment among students had a significant relationship with reports of unprofessional behavior, such as having conflicts or arguments with colleagues, absence from class or work without reasonable cause, and mistreatment of others.

Medical students' experiences of mistreatment

The prevalence of medical students' experiences of mistreatment in medical school in the current study was 74.5%, which is comparable to that reported in the United States (63.9% by faculty members and 75.5% by residents) and Japan (68.5%).^{7,10,19} Workplace learning-related bullying was one of the most common types of mistreatment, consistent with previous studies. Mistreatment and disrespectful behaviors are reported to be related to the culture in the medical school and characteristics of the clinical workplace, such as hierarchy, medical culture, pressure on medical students and stressful health care environments.^{31,33}

The primary source of mistreatment in the current study was attending staff who directly supervised and taught medical students (31.6%). This was in contrast to previous studies in the United States (63.9%) and Japan (45.2%) that reported faculty members as the primary source of mistreatment.^{7,10,32} However, when only pre-clinical year students were explored, the results revealed that senior students and peers were the main source of mistreatment (25.9% in pre-clinical year students). This may be because pre-clinical students spend less time in the clinical environment and interact more with senior students in both intra- and extra-curricular activities compared with clinical year students. These results suggest that faculty development programs are needed to create safer learning environments, especially in clinical settings. Not only faculty members, but also residents, fellows, student peers, other health professionals, and educational staff

need to be included in such programs to promote a safer learning environment to support medical students.

Mistreatment reporting actions

Only 8.2% of students in the current study had filed an official report of mistreatment to someone on the faculty. This proportion was low compared with the 30% report rate observed in previous studies.¹³ Possible reasons for not reporting a mistreatment event include fear of reprisal, time- and energy-consuming reporting processes, and the incident being of insufficient severity to report.^{32,33} This phenomenon may be similar to the “failure to fail” phenomenon, in which a person is reluctant to report a negative result and prefers to remain silent about unpleasant messages. The reluctance to report negative events may also be related to fear about harming one’s reputation, and uncertainty about the consequences of reporting.³⁹ Students’ decisions about whether to report mistreatment may be influenced by the cost of the potential outcome, such as their ability to trust and be safe within the institution.⁴⁰ Therefore, a suitable reporting system should consider what the consequences are likely to be for those who report mistreatment and those who are reported. Future investigations should explore the reasons and factors underlying this underreporting. An increase in the number and nature of mistreatment reports by mistreated students and bystanders may be helpful for developing an effective reporting system for identifying problems and finding solutions.

Association between mistreatment of medical students in the clinical phase and student-related factors

The current year of study had significant associations with workplace-related bullying, person-related bullying, physically intimidating bullying, and sexual harassment. This was the most significant factor associated with mistreatment among clinical medical students, and was consistent with the findings of a previous study in medical students in Southern Thailand.¹¹ It can be hypothesized that students in the higher clinical years’ experience more unsafe clinical learning environments or more intense hierarchical cultures. Further studies should focus on the potential causes of mistreatment in different clinical years. The risks of depression and burnout were significantly associated with mistreatment categories. This finding was in alignment with those of previous studies, confirming that mistreatment is associated with medical students’ well-being in general in both Western and Asian context.^{7,15,19,20,21}

Correlations between mistreatment and reported lack of professionalism of medical students in the clinical year level

Reporting a patient’s case untruthfully was the most common type of unprofessional behavior self-reported by those that were also mistreated, as well as having conflicts or

arguments with colleagues, being absent from class or work without reasonable cause, and mistreatment of others. Reporting a patient's case untruthfully, having conflicts or arguments with colleagues, and mistreatment of others are dishonest and disrespectful behaviors that were mentioned as students' unprofessional behaviors among both Asian and Western students.⁴¹ Previous studies observed that experiencing mistreatment is related to burnout, which is in turn associated with sub-optimal patient care and attrition from the medical profession.⁴²⁻⁴⁴ In this study, mistreatment and self-reported unprofessional behavior of medical students were correlated. It has been reported that some individuals may accept and enculturate mistreatment into their future practice.⁴⁵

Strengths and limitations

This study revealed evidence of mistreatment among medical students and associations between types of mistreatment and student-related factors. However, this study examined students at one institution and may not be representative of the general population of Asian medical students. Additionally, the findings in this study were based on student self-reporting which may not be compatible with other perspectives. Moreover, this correlational study did not enable us to draw conclusions regarding the direction of causality. Further studies will be needed to explore the cause and effect of the phenomena observed in the current study.

Conclusions

Mistreatment of medical students is a serious problem worldwide, including in Thailand. A high prevalence of mistreatment was revealed, and workplace learning-related bullying was the most common category. Attending staff were the most common source of mistreatment. Mistreatment was associated with several negative consequences, including burnout, risk of depression, and unprofessionalism. However, the rate of mistreatment reporting by medical students was low. Therefore, increasing awareness among medical students and related healthcare providers is necessary. In addition, faculty development programs should address this issue and a systematic mistreatment reporting system should be developed to capture mistreatment in medical schools.

References

1. Silver HK. Medical students and medical school. *JAMA*. 1982;247(3):309-10.
2. Baldwin DC Jr, Daugherty SR, Eckenfels EJ. Student perceptions of mistreatment and harassment during medical school: a survey of ten United States schools. *West J Med*. 1991;155(2):140-5.
3. Smith-Han K, Collins E, Asil M, Blakey AG, Anderson L, Berryman E, et al. Measuring exposure to bullying and harassment in health professional students in a clinical workplace environment: evaluating the psychometric properties of the clinical workplace learning NAQ-R scale. *Med Teach*. 2020;42(7):813-21.
4. Mavis B, Sousa A, Lipscomb W, Rappley M. Learning about medical student mistreatment from responses to the Medical School Graduation Questionnaire. *Acad Med*. 2014;89(5):705-11.
5. Silver HK, Glick AD. Medical student abuse: incidence, severity, and significance. *JAMA*. 1990;263(4):527-32.
6. Frank E, Carrera JS, Stratton T, Bickel J, Nora LM. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *Br Med J*. 2006;333(7570):682.
7. Cook A, Arora V, Rasinski K, Curlin F, Yoon J. The prevalence of medical student mistreatment and its association with burnout. *Acad Med*. 2014;89(5):749-54.
8. Fnais NS, Soobiah C, Chen M, Lillie E, Perrier L, Tashkhandi M, et al. Harassment and discrimination in medical training: a systematic review and meta-analysis. *Acad Med*. 2014;89(5):817-27.
9. Shoukat S, Anis M, Kella DK, Qazi F, Samad F, Mir F, et al. Prevalence of mistreatment or belittlement among medical student — a cross sectional survey at a private medical school in Karachi, Pakistan. *PLoS One*. 2010;5(10):e13429.
10. Nagata-Kobayashi S, Sekimoto M, Koyama H, Yamamoto W, Goto E, Fukushima O, et al. Medical student abuse during clinical clerkships in Japan. *J Gen Intern Med*. 2006;21(3):212-8.
11. Pitanupong J. The prevalence and factors associated with mistreatment perception among Thai medical students in a southern medical school. *Siriraj Med J*. 2019;71(4):310-7.
12. Kassebaum D, Cutler E. On the culture of student abuse in medical school *Acad Med*. 1998;73(11):1149-58.
13. Mavis B, Sousa A, Lipscomb W, Rappley M. Learning about medical student mistreatment from responses to the Medical School Graduation Questionnaire. *Acad Med*. 2014;89(5):705-11.
14. Ogden P, Wu E, Elnicki M, Battistone MJ, Cleary LM, Fagan MJ, et al. Do attending physicians, nurses, residents, and medical students agree on what constitutes medical student abuse? *Acad Med*. 2005;80(Supplement):S80-3.
15. Frank E, Carrera J, Stratton T, Bickel J, Nora L. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ*. 2006;333(7570):682.
16. Zhu G, Tan T. Medical student mistreatment by patients in the clinical environment: prevalence and management. *Singapore Med J*. 2019;60(7):353-8.
17. Elghazally NM, Atallah AO. Bullying among undergraduate medical students at Tanta University, Egypt: a cross-sectional study. *Libyan J Med*. 2020;15(1):1816045.
18. Pitanupong J. The prevalence and factors associated with mistreatment perception among Thai medical students in a southern medical school. *Siriraj Med J*. 2019;71(4):310-7.
19. Elnicki D, Ogden P, Wu E, for the PAMS Group. Medical student abuse from multiple perspectives. *Clin Teach*. 2007;4(3):153-8.
20. Brandford E, Hasty B, Bruce J, Merrell SB, Shipper ES, Lin DT, et al. Underlying mechanisms of mistreatment in the surgical learning environment: a thematic analysis of medical student perceptions. *Am J Surg*. 2018;215(2):227-32.
21. Frank E, Dingle AD. Self-reported depression and suicide attempts among U.S. women physicians. *Am J Psychiatry*. 1999;156(12):1887-94.
22. Mahajan A. Stress in medical education: a global issue or much ado about nothing specific? *Southeast Asian J Med Educ*. 2010;4(2):9-13.
23. Kaplan H, Sadock B. Learning theory. In: *Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*. 8th ed. 2000.

24. Niemi P, Vainiomäki P. Medical students' academic distress, coping, and achievement strategies during the preclinical years. *Teach Learn Med.* 1999;11(3):125-34.
25. Linn B, Zeppa R. Stress in junior medical students. *Acad Med.* 1984;59(1):7-12.
26. Rosal M, Ockene I, Ockene J, Barrett S, Ma Y, Hebert J. A longitudinal study of students' depression at one medical school. *Acad Med.* 1997;72(6):542-6.
27. Shapiro SL, Shapiro DE, Schwartz GE. Stress management in medical education: a review of the literature. *Acad Med.* 2000;75(7):748-59.
28. Hays LR, Cheever T, Patel P. Medical student suicide, 1989–1994. *Am J Psychiatry.* 1996;153(4):553-5.
29. Marshall RE. Measuring the medical school learning environment. *J Med Educ.* 1978;53:98104
30. Van der Zwet J, Dorman J, Teunissen PW, de Jonge LPJW, Scherpbier AJJA. Making sense of how physician preceptors interact with medical students: discourses of dialogue, good medical practice, and relationship trajectories. *Adv Health Sci Educ.* 2014;19:85–98.
31. Leape L, Shore M, Dienstag J, Mayer RJ, Edgman-Levitan S, Meyer GS, et al. Perspective: a culture of respect, part 1: the nature and causes of disrespectful behavior by physicians. *Acad Med.* 2012;87(7):845-52.
32. Parkes L, Bochner S, Schneider S. Person-organisation fit across cultures: an empirical investigation of individualism and collectivism. *Applied Psychology.* 2001; 50(1):81–108.
33. Shamim MS, Baig L, Torda A, Balasooriya C. Culture and ethics in medical education: the Asian perspective. *J Pak Med Assoc.* 2018;68(3):444-6.
34. Colenbrander L, Causer L, Haire B. "If you can't make it, you're not tough enough to do medicine": a qualitative study of Sydney-based medical students' experiences of bullying and harassment in clinical settings. *BMC Med Educ.* 2020;20:86.
35. Chung M, Thang C, Vermillion M, Fried J, Uijtdehaage S. Exploring medical students' barriers to reporting mistreatment during clerkships: a qualitative study. *Med Educ Online.* 2018;23(1):1478170.
36. Einarsen S, Hoel S, Notelaers G. Measuring exposure to bullying and harassment at work: Validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. *Work Stress.* 2009;23(1):24-44.
37. Puranitee P, Saetang S, Sumrithe S, Busari JO, van Mook WNKA, Heeneman S. Exploring burnout and depression of Thai medical students: the psychometric properties of the Maslach Burnout Inventory. *Int J Med Educ.* 2019;10:223-9.
38. Lotrakul M, Sumrithe S, Saipanish R. Reliability and validity of the Thai version of the PHQ-9. *BMC Psychiatry.* 2008;8:46.
39. Mak-van der Vossen M. "Failure to fail": the teacher's dilemma revisited. *Med Educ.* 2019;53(2):108-10.
40. Bell A, Cavanagh A, Connelly CE, Walsh A, Vanstone M. Why do few medical students report their experiences of mistreatment to administration? *Med Educ.* 2021;55(4):462-70.
41. Mak-van der Vossen M, van Mook W, van der Burgt S, Kors J, Ket JC, Croiset G, et al. Descriptors for unprofessional behaviours of medical students: a systematic review and categorisation. *BMC Med Educ.* 2017;17(1):164.
42. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172(18):1377-85.
43. Williams ES, Konrad TR, Scheckler WE, Pathman DE, Linzer M, McMurray JE, et al. Understanding physicians' intentions to withdraw from practice: the role of job satisfaction, job stress, mental and physical health. *Health Care Manage Rev.* 2001;26(1):7-19.
44. Williams ES, Skinner AC. Outcomes of physician job satisfaction: a narrative review, implications, and directions for future research. *Health Care Manage Rev.* 2003;28(2):119-39.
45. Barrett J, Scott KM. Acknowledging medical students' reports of intimidation and humiliation by their teachers in hospitals. *J Paediatr Child Health.* 2018;54(1):69-73.

Chapter 6

Faculty member perceptions of their
actions in influencing and supporting
medical students' sense of belonging,
engagement, and collegiality

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Submitted

Abstract

Background

Burnout is a worldwide intercultural problem affecting physicians, postgraduate medical trainees, and undergraduate medical students. Enhancing a sense of belonging, engagement, and collegiality in educational settings has been recommended to prevent burnout. The faculty role herein may significantly influence students' well-being. The current study investigated which variables foster a sense of belonging (i.e., being valued and fitting in), engagement, and collegiality from the perspective of medical school faculty.

Methods

We used a qualitative study design to explore faculty members' perceptions regarding promoting/inhibiting a sense of belonging, engagement, and collegiality among undergraduate medical students. Full-time faculty members involved in undergraduate teaching participated in semi-structured individual interviews. The qualitative analysis followed a six-step thematic analysis process.

Results

Twenty full-time faculty members participated in the interviews. Respondents expressed their perceptions on their actions and zone of influence in promoting a sense of belonging, engagement, and collegiality. Three main themes related to the ways in which faculty contribute to cultivating a sense of belonging, engagement, and collegiality emerged: creating safe learning environments (mutual respect and non-judgmental learning environments, and adjustment of the learning environment), promoting teacher-student or student-student relationships (promoting relationships in the workplace, making students feel valuable, encouraging socialization, stimulating student-student/resident interaction), and program design factors that promote medical students' sense of belonging (mentoring systems, extra-curricular activities).

Conclusions

The results revealed how in the perception of faculty members, medical students' sense of belonging, engagement, and collegiality may be facilitated or supported. In addition, the importance of certain program elements, such as mentoring system, and scaffolded social time were mentioned. The identified themes can be used as strategies in future faculty development programs to increase awareness among teachers. Further, it was identified that residents may have a crucial role in promoting medical students' sense of belonging, engagement, and collegiality. A resident-as-teacher programs might support students' sense of belonging, engagement, and collegiality.

Introduction

Burnout is a widespread psychological condition among medical students and professionals in, response to chronic interpersonal stressors on the job. Maslach¹ defined burnout as a condition comprising three characteristics: high exhaustion, high depersonalization, and a lack of personal accomplishment. Burnout is the antithesis of work engagement² and a global intercultural phenomenon affecting physicians, postgraduate medical students, and undergraduate medical students.³⁻⁵ It has been established that many medical students experience burnout, with a reported prevalence of 45%–75%.³⁻⁵ In Thailand, the rate of burnout among medical students was reported to be 28.4% in 2016 and 19.2% in 2020.⁶⁻⁷

According to psychological studies, having a social environment including family, social communities, and working team can be beneficial and provide individuals with a sense of meaning, purpose, and belonging.⁸ Membership and involvement in professional working groups are vital for preventing physician burnout, and can improve psychological wellness and self-esteem.⁹⁻¹⁰ A sense of belonging is included in Maslow's hierarchy of human needs (physiological needs, safety, love/belonging, self-esteem, and self-actualization) and has been proposed as a potential framework for addressing wellness efforts and combating burnout among postgraduate medical trainees.¹¹ Belonging is a personal sense of "connection" or "acceptance" from others, evolving from the interaction between individuals and their immediate surroundings.¹²⁻¹³ A sense of belonging influences not only well-being, stress, and burnout, but also learning and achievement, clinical efficacy, and career engagement among nurses and medical students.^{7,12-16}

In medical education, elements of team work that foster relationships between students, trainees, faculty members, and patients, have been indicated as key factors in promoting a sense of belonging.^{11,17} Faculty members have a significant impact on students' well-being. Self-reported mistreatment, such as racial discrimination or public humiliation by faculty and residents, was reported to be associated with burnout and mental problems in medical students.¹⁸⁻²³ Conversely, relationships between medical students and faculty staff positively affect students' well-being. For example, creating a nurturing learning environment through faculty-student mentoring programs or senior-junior buddy programs can reduce students' distress.²⁴ Promoting social interaction, social resilience, and a culture of appreciation between students and mentors and instructors should be embedded and enhanced in the curriculum, and can affect the sense of wellbeing.^{2,25} This approach was proposed as a new strategy to reduce and prevent burnout.²⁶ In addition to student and faculty member relationships in the workplace and learning environment, collegiality is also part of social interaction and social resilience, which refers to a group of individuals who are committed to preserving, validating, communicating, and extending knowledge. One advantage of collegiality is the group encouraging each member to succeed in a specific endeavor, which can also serve as a helpful coping mechanism when an individual is in distress.^{27,28}

Regarding medical students' perspectives, factors that foster collegiality, a sense of belonging, and engagement include relevant learning activities and, safety in the learning environment. Other factors include peer interaction, program design factors, dynamics of collegiality while progressing through medical school, as well as students' personal stance and social skills.⁷ Faculty members' perspectives also need to be explored, because they are a crucial part of the learning environment and program design, and are involved in students' social competency development. Unfortunately, studies exploring faculty members' perspectives regarding strategies for enhancing a sense of belonging, engagement, and collegiality are limited.

Faculty members play important roles in the clinical workplace and could contribute to students' well-being and burnout. Therefore, this study aims to investigate the variables that foster a sense of belonging (being valued and fitting in), engagement and collegiality amongst students from the perspective of faculty members in medical school.

Research question

What factors do faculty members perceive as crucial for influencing (positively or negatively) the sense of belonging, engagement, and collegiality among undergraduate medical students in medical education?

Methods

Study design

A qualitative study was conducted to explore faculty members' perception of the factors promoting/inhibiting the sense of belonging, engagement, and collegiality among undergraduate medical students. The Ethics Committee of the Faculty of Medicine of Ramathibodi Hospital, Mahidol University, approved this study (COA.MURA 2020/679).

Participants and setting

Full-time faculty members involved in undergraduate teaching in the first semester of the 2021 academic year were invited by telephone to voluntarily participate in the study using randomized sampling from staff codes. These faculty members were asked to reflect on their experiences in the classroom or clinical learning environment regarding the sense of belonging, engagement, and collegiality among undergraduate medical students.

Interviews

Based on the literature on basic psychological needs satisfaction, engagement, and collegiality, semi-structured interviews were used to refine and explore factors that

influenced participants' perspectives regarding the sense of belongingness, engagement, and collegiality. Interviews were conducted individually because of the delicate subject matter. The interviews were performed by a researcher with qualitative interviewing experience (PP), using a semi-structured interview guide. All participants provided informed consent and were informed that all interview recordings and data collected would be kept private. Participants had freedom to cease their participation at any moment for any reason. Probing questions were used to further clarify the rationales when and wherever necessary. The interviews took place online via Video call in a reserved private room and were digitally audio-recorded and anonymized.

Analysis

The qualitative analysis followed a six-step thematic analysis process.²⁵ This process included familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining, and naming themes, and producing a report using the widely accepted principles of open coding, axial coding, and selective coding on the data. While data collection was ongoing, iterative data analysis was carried out to examine new subjects and elements revealed in later interviews. First, two researchers independently examined the transcripts of the interviews (PP and WK) with constant comparison. When there were differences in interpretation, the researchers discussed the findings until consensus was reached. The two researchers then familiarized themselves with the data independently, generated initial codes, and reflexively considered the codes with each other. The preliminary coding system was then structured and discussed between the two researchers during the interview process until theoretical data sufficiency was attained, or until the point at which no more new information or concepts could be contributed. The authors searched, reviewed, defined, and named themes iteratively until they reached an agreement. Finally, the final report was carefully translated into English.

Reflexivity

We were cognizant of our potential biases and personal experiences as researchers and their possible impact while collecting, analyzing, and interpreting the data. Therefore, we worked as a heterogeneous research team to minimize the burden of positionality. PP was the principal investigator with a background in health professions education sciences and led the data collection. She is a faculty member and had no influence or power over other faculty members. WK, WvM and JB contributed as co-researchers and are medical educators with experience in education sciences for health professions. SH, who has a doctorate in biological sciences and subsequent training and experience in educational research, contributed as a co-researcher. JB and WvM both hold doctorates in medical education. These researchers (SH, WvM, and JB) had no direct contact with participants and gave independent external medical education and research views on the data and its interpretation. They examined (counter-) instances and counter-

examples, supported the theme analysis, and contributed to the scientific writing process to minimize tunnel vision or confirmation bias. The fact that WvM and JB are also practicing physicians, in addition to having competence in medical education, gave them the ability to analyze the findings of the study in the context of the current clinical healthcare environment.

Results

Twenty full-time faculty members participated in the interviews. Respondents expressed their perceptions regarding whether students' actions and their actions can or do promote a sense of belonging, engagement, and collegiality. Our analysis revealed the following three thematic categories regarding how faculty members can contribute to cultivating a sense of belonging, engagement, and collegiality:

- 1) Faculty members create a safe learning environment.
- 2) Faculty members' actions to promote teacher-student or student-student relationships
- 3) Program design factors that promote medical students' sense of belonging, engagement, and collegiality.

1. Faculty members create a safe learning environment

Faculty reported a safe learning environment as a crucial strategy for enhancing medical students' sense of belonging, engagement, and collegiality. Faculty members reported using the following actions:

- *Respect for the student as a potential colleague/professional in the clinical workplace*

Faculty members noticed effective ways to engage and promote a sense of belongingness in clinical clerkship. These included recognizing students as people with mutual respect and promoting psychological safety. Some faculty members also shared using a more intense or harsher teaching styles themselves or observing their colleagues, e.g. when facing a student with inadequate knowledge. They also noticed the students' responding by hiding feelings and thoughts, and being quieter.

"A student was assigned to present a patient story during ward rounds or bedside teaching in a large group. They felt unsafe. Sometimes teachers were harsh toward them in public or humiliated them in a group." (Participant no. 3, male, clinical year experience)

"If the teacher is intense, students will not express their thoughts, for fear of further discussion." (Participant no. 6, female, clinical year experience)

- *Creating a non-judgmental learning environment*

Faculty members reported creating non-judgmental safe spaces in the classroom for students to address failure, errors, and mistakes, and giving feedback with a growth mindset.

"I allowed students to express their ideas and thoughts, including mistakes, without interrupting. Giving constructive feedback will boost their confidence in the future when they speak, present, or express themselves. Some students couldn't do a lab test and were reluctant to seek help or make mistakes. They don't want to be known as poor performers or to not be considered smart."
(Participant no. 3, male, clinical year experience)

2. Faculty members' actions to promote teacher-student and student-student relationships

Faculty members were able to address and understand the drawbacks of the learning environment and situations that compromised medical students' sense of belonging, engagement, and collegiality (e.g., excessive clinical duties, overly complicated learning tasks or meaningless tasks, and the mindset of other health professionals). Moreover, many faculty members discovered effective strategies for overcoming these problems. These strategies included clinical teaching techniques to engage multi-level teaching, providing meaningful tasks to make students feel valued, increasing interaction between faculty members and students in clinical teaching, decreasing group size, initiating peer interactions, and fostering social skills for pre-clinical year students. Moreover, faculty members discussed creating a supportive learning environment as a critical strategy to promote students' sense of belonging, engagement, and collegiality. Other strategies included facilitating peer support, and including students in a patient care team and program design. These strategies are described in more detail below:

- *Promoting teacher-student relationships*

In some busy clinical workplaces with larger groups of medical students, faculty members used strategies to increase interaction, such as preparing students for what they will see, assigning them smaller tasks, acting as a moderator or facilitator to support peer relationships, talking or asking them related questions, and tailoring teaching to the level of the students.

"To encourage medical students to feel recognized during multilevel bedside teaching, I separate my ward rounds to focus on early medical students, final year medical students, and resident teaching. Thus, everyone will be seen and assessed. When medical students were not present, their minds seemed absent or wandering, particularly while I was talking to residents. I asked them some

questions. This will engage the students, and they can learn from other cases and pull their minds back to the round group.” (Participant no. 17, male, clinical year experience)

Other strategies included debriefing students on what they had learned, especially in settings where they felt compromised by the feeling of being left out, such as in the operation theater, where surgeons’ tasks were too complicated for the level of students, and the surgeon was constantly under pressure during the operation.

“If a surgeon asks a student a question during the operation, talk to them in a way that includes them in the patient care team and focus on what they can learn. The student will feel more comfortable.” (Participant no. 3, male, clinical year experience)

- *Making students feel valued*

Faculty members introduced students to the team and patients, encouraged students to perform meaningful tasks by having them write prescriptions, perform surgical procedures, listen to their opinion, and contribute to clinical decision-making.

“If a surgeon asks a student a question during the operation, talk to them in a way that includes them in the patient care team and focus on what they can learn. The student will feel more comfortable.” (Participant no. 3, male, clinical year experience)

- *Faculty members socializing with students*

Informal contact time was an excellent opportunity to socialize and engage students to be part of the team or as a colleague. Faculty members spent after office hours to promote cultivating a sense of belonging, engagement, and collegiality.

“I noticed that students felt good when I socialized with them, such as bringing them to a dinner or having snacks. We took care of a patient together and the patient passed away. I invited the student to accompany me to the patient’s funeral. I have never asked for his feedback, but I perceived that he felt okay.” (Participant no. 7, male, clinical year experience)

- *Promoting student-student relationships*

Faculty members observed that some students lacked specific social competencies, which might lead to a lack of social adaptation, such as avoiding putting effort into engaging with unfamiliar people.

"I met a first-year medical student after the semester opened for a while. He didn't know many peers, nor any seniors. He felt less confident to meet up and avoided joining the activities. I encouraged him to start to meet others and join the social activities." (Participant no. 14, male, pre-clinical experience)

Participants reported that some students need more encouragement and support to enhance the development of their social competence. However, faculty members also indicated that it was not easy to find a way to promote social competence or motivate students to engage and belong in the group:

"I noticed that students from provinces other than Bangkok rarely participate in activities or interact with each other. I don't know how to help. These students seem to be quite lonely..." (Participant no. 11, female, pre-clinical experience)

The faculty perceived that they could stimulate the development of students' social skills by allowing or guiding them to initiate conversations with their peers and support each other's learning.

"When seeing an interesting patient case, teachers encouraged students to call their friends and allow them to share learning." (Participant no. 8, male, clinical year)

"Sometimes I ask medical students to sit in a small group and reflect on their feelings. Then I let them share their thoughts, talk to each other, and think about each other's feelings. As a result, they become closer, get to know each other better, and can support each other." (Participant no. 12, male, both pre-clinical and clinical year experience)

Prosocial behavior is an essential skill for promoting social competency. Faculty members reported that medical students acquire empathy and sympathy for their peers who are encountering difficulties as a result of facing the same learning or working obstacles in a small group setting. In these difficult situations, faculty members observed that students exhibited certain prosocial behaviors, such as calling on friends to participate in learning activities, sharing learning resources, and helping each other with ward work, which created a positive atmosphere that other medical students followed, and eventually the whole group supported each other.

"When one student in a group is helpful and supportive, the group as a whole will be supportive. This differs from other groups in which the majority of students do not reach out to one another, and in which some students appear to be in their own world while others are totally focused on their academic studies. I usually

observe one student initiating a helpful environment, followed by others.”
Participant no. 2, female, clinical year experience)

In alignment with actions to promote relationships, residents were seen and recognized as essential partners for engaging students in the patient care team and promoting a friendly atmosphere for student collegiality. This did not always work out in practice (e.g., for early year students).

“Residents can let students stay next to them while they work. Students can learn by observing. Residents don’t need to teach or deliver a lot of content at the time; they could just ask questions about how to examine the patient. Normally, residents paid attention to the final year medical students rather than those in the early clinical years because early-year students contribute less to service work, so they were overlooked” (Participant no. 2, female, clinical year experience)

In addition to the above, this study highlighted the effect of mindsets of other health professionals in the learning environment, such as nurses, on student well-being. There was a mismatch between medical students' learning and other health professionals' service mindsets. Thus, sometimes nurses provided negative reactions toward medical students which were perceived to compromise a safe learning environment“.

"In the operating theatre, students in a big group entered at the same time. There was a lot of equipment. Nurses shouted, "Do not touch! Keep out! "This made them feel like outsiders, useless. During a medicine injection, nurses said, "Do not come close!" Students complained about the uselessness and couldn't figure out how or what to learn in the operation theatre." (Participant no.3, male, clinical year experience)

3. Program design factors that promote medical students' sense of belonging, engagement, and collegiality

Faculty members revealed that the design of the mentoring system and extracurricular activities could promote or compromise relationships and the sense of belonging among medical students.

- *Mentoring system*

A mentor coaches a small group of students and maintains contact in the 5 years of the medical program. This facilitates faculty members having longitudinal roles and being active in promoting medical students' sense of belonging, engagement and collegiality, such as having dinner with mentees, attending group meetings, and engaging in informal conversation on social media platforms.

“Some students never talked to each other. One had depression; another student knew about his situation but never offered help. The mentor explained the importance of closely observing other students, and providing extra help as needed. After the mentor’s explanation, the peer was willing to help.” (Participant no.4, female, clinical year experience)

- *Extracurricular activities*

Some extracurricular activities, such as the “freshman welcoming ceremony” or “open house” to introduce high school students to medical school, provide opportunities for medical students to lead and organize activities and work with teachers. These activities enhanced students’ teamwork and leadership, allowed them to get to know each other better, supported them to build relationships, and engaged them. COVID-19 restrictions and physical separation with the shift to online activities impeded connection and the building of student-to-student and teacher-to-student relationships. Students were seen to be unwilling to participate actively, and teachers reported that they struggled to engage them.

“The freshman “welcoming ceremony” turned out to be online during COVID-19. Students turned off their cameras, and there was no response or discussion. It is very tough to stimulate strangers to talk to each other for the first time online. Moreover, the ceremony was short, and did not allow for students to gradually open up before starting learning. In addition, students didn’t talk to me. They seemed shy. Even when they turned their cameras on, the sense of engagement was still lacking. We normally build a connection while hanging out after study time. During physical distancing and distance learning, students stayed in other provinces. Some students never answered my questions regarding personal and academic matters.” (Participant no. 11, female, pre-clinical year experience)

Discussion

The current study showed the three main themes in faculty members’ perceptions on their actions and zone of influence in affecting (positive or negative) undergraduate medical students’ sense of belonging, engagement, and collegiality. The key factors identified by faculty members were creating a safe learning environment (mutual respect and non-judgmental learning environments), promoting teacher-student or student-student relationships (promoting relationships in the workplace, making students feel valued, encouraging socialization, stimulating student-student/resident interaction), and program design factors that promote medical students’ sense of belonging (mentoring systems, extra-curricular activities).

The strategies and characteristics identified by faculty members regarding the first and second themes (creating a safe learning environment and promoting teacher-student or student-student relationships) are aligned with existing literature on effective clinical teaching and positive characteristics of good (clinical) teachers. Teachers' positive characteristics as clinicians include the capacity for teamwork, collegial skills, clinical reasoning, and professionalism. The teaching characteristics of teachers include maintaining positive relationships and a supportive learning environment; providing adequate explanation and demonstration; providing individual attention; and providing formative assessment. Finally, teachers' personal traits include being personable and respectful of others, were also addressed in this study.²⁹⁻³² These teacher traits and teaching methods could be emphasized in faculty development programs to support students in their learning and mental well-being.

In this study, a critical factor that promoted students' sense of belonging, engagement, and collegiality was the positive relationship between faculty members and students. This relationship was developed during clinical clerkship learning and outside of medical school by faculty members. Several strategies were described by faculty members to build this relationship, such as engaging multi-level teaching to enhance teacher-student interactions, making students feel valued, and socialization. Positive faculty-student relationships are essential for student development in competency-based medical education coaching. Effective coaching and feedback could occur in the context of a good rapport and positive relationships between students and teachers.³³ Moreover, effective learning, assessment, and feedback interactions are built on a trusting educational alliance. The teacher-student relationship, which involves understanding the goal of the relationship, agreeing on how to achieve the goal, and trusting teachers, is reported to have significant influence on the educational alliance, which impacts on assessment and learning results.³⁴ The current study also confirmed that teacher-student relationships are essential for student engagement, in accord with previous literature in higher education³⁵⁻³⁶, teacher-student relationships also have an effect on students' well-being.³⁷

This study highlighted a mismatch between medical students' learning and service mindsets. Although it may be challenging to align health services with the clinical learning context, it is known that this can demotivate medical students.³⁸⁻³⁹ It is vital that this is acknowledged, to open up discussions on mindset, expectations, and roles of the health professionals involved in the learning environment, e.g., by the program management.

In medical schools with residency training programs and medical education, residents play an essential role through near-peer teaching, and spend more time with each other than faculty members [40]. In the current study, faculty members observed the vital role of residents in promoting or compromising students' sense of belonging, engagement,

and collegiality; engaging students in the patient care team, respecting students, and promoting a friendly atmosphere were related to increased student collegiality. It is crucial that residents themselves are support and develop the teaching skills to promote understanding and the good ability to create a supportive learning environment⁴¹⁻⁴² and to facilitate the process of learning and the interrelationship between them.⁴³ Therefore, institutions and residency programs should dedicate time and allocate adequate resources for residents to learn how to teach. The current findings may be helpful for informing the future development of resident-as-teacher programs.⁴⁴

A mentoring program was shown to be useful for engaging students, this aligns with the findings of a literature review indicating that mentoring programs could engage students in research and academia, help them to share personal problems, and support them to socialize with mentors.⁴⁵ These factors were also found to be important for the retention and recruitment of trainees in medical and surgical specialties.⁴⁵⁻⁴⁶ Furthermore, programs that foster long-term relationships between faculty mentors and students, in which faculty mentors not only teach but also model professionalism and ethical behavior, have the potential to transform groups into learning communities that encourage students to become more active, engaged, and self-motivated learners.⁴⁷

Finally, faculty members' perspectives show considerable overlap with students' perspectives regarding how to promote students' sense of belonging, engagement and collegiality.⁷ For students, a safe learning environment and a curriculum design that will allow student contact times with peers, mentors, and extracurricular activities, were also indicated as vital for maintaining a sense of belonging, engagement, and collegiality.

Strengths and limitations

The acquired novel insights on how to support medical students' sense of belonging, engagement, and collegiality from the faculty members' perspectives, could be adopted as strategies to promote wellbeing in the medical schools studied. However, the potential transferability and applicability in other medical schools' settings still needs to be studied. The results also provided various helpful, practical strategies that faculty members used, some of which were perceived to be effective. A limitation of the current study was that the retrospective reports of faculty members' experiences might be ambiguous and the collected data was only from faculty members, as there was just one stakeholder involved in the learning environment. Therefore, we recommend that future studies examine the perspectives of other stakeholders that might influence students' sense of belonging, engagement, and collegiality, such as other health professions or residents, as well as to explore these topics in the other contexts.

Conclusion

The current study provided observations and strategies from faculty members' perspectives to promote medical students' sense of belonging, engagement, and collegiality. These strategies could be used in the future development of the faculty development program to create good teachers' characteristics, including creating a safe learning environment; respecting students; enhancing teacher-student or student-student relationships; making students feel valuable; and including students in the patient care team. These teachers' characteristics could benefit students' learning and well-being. Some strategies to promote medical students' sense of belonging, engagement, and collegiality were related to program design and curriculum development, such as mentoring systems and extra-curricular activities. In addition, residents were seen to play an important role by engaging students in the patient care team, respecting students, and promoting a friendly atmosphere related to student collegiality. Promotion of these activities could be included in future resident-as-teacher programs.

References

1. Maslach C. Burnout: a multidimensional perspective. In: Schaufeli WB, Maslach C, Marek T, eds. *Professional Burnout: Recent Developments in Theory and Research*. Washington, DC: Taylor & Francis. 1993.
2. Maslach C, Leiter MP. New insights into burnout and health care: Strategies for improving civility and alleviating burnout. *Med Teach*. 2016;39 (2):160–163.
3. Chang E, Eddins-Folensbee F, Coverdale J. Survey of the prevalence of burnout, stress, depression, and the use of supports by medical students at one school. *Acad Psychiatr*. 2012;36:177–182.
4. Ishak W, Nikraves R, Lederer S, Perry R, Ogunyemi D, Bernstein C. Burnout in medical students: a systematic review. *Clinical Teacher* 2013;10(4):242–245.
5. Fridner A, Belkić K, Minucci D, Pavan L, Marini M, Pingel B, et al. Work environment and recent suicidal thoughts among male university hospital physicians in Sweden and Italy: the health and organization among university hospital physicians in Europe (HOUPE) study. *Gender Med*. 2011;8(4):269–279.
6. Puranitee P, Saetang S, Sumrithe S, Busari JO, van Mook WNKA, Heeneman S. Exploring burnout and depression of Thai medical students: the psychometric properties of the Maslach Burnout Inventory. *Int J Med Educ*. 2019;10:223–229.
7. Puranitee P, Kaewpila W, Heeneman S, van Mook WNKA, Busari JO. Promoting a sense of belonging, engagement, and collegiality to reduce burnout: a mixed methods study among undergraduate medical students in a non-Western, Asian context. *BMC Med Educ*. 2022;22(1):327.
8. Haslam SA, Jetten J, Postmes T, Haslam C. Social identity, health and well-being: an emerging agenda for applied psychology. *Appl Psychol*. 2009;58(1):1–23.
9. Jetten J, Branscombe NR, Haslam SA, Haslam C, Cruwys T, Jones JM, et al. Having a lot of a good thing: multiple important group memberships as a source of self-esteem. *PLoS One*. 2015;10(5):e0124609.
10. McNeill KG, Kerr A, Mavor KI. Identity and norms: the role of group membership in medical student wellbeing. *Perspect Med Educ*. 2014;3(2):101–112.
11. Ashktorab T, Hasanvand S, Seyedfatemi N, Salmani N, Hosseini SV. Factors affecting the belongingness sense of undergraduate nursing students towards clinical setting: a qualitative study. *J Caring Sci*. 2017;6(3):221–235.
12. Vivekananda-Schmidt P, Sandars J. Belongingness and its implications for undergraduate health professions education: a scoping review. *Educ Prim Care*. 2018;29(5):268–275.
13. Hagerty BM, Lynch-Sauer J, Patuskyl KL, Bouwsema M, Collier P. Sense of belonging: a vital mental health concept. *Arch Psychiatr Nurs*. 1992;6(3):172–177.
14. Levett-Jones T, Lathlean J. Belongingness: a prerequisite for nursing students' clinical learning. *Nurse Educ Pract*. 2008;8(2):103–111.
15. Levett-Jones T, Lathlean J, Higgins I, McMillan M. Staff-student relationships and their impact on nursing students' belongingness and learning. *J Adv Nurs*. 2009;65(2):316–324.
16. Gerull KM, Parameswaran P, Jeffe DB, Salles A, Cipriano CA. Does medical students' sense of belonging affect their interest in orthopaedic surgery careers? A qualitative investigation. *Clin Orthop Relat Res*. 2021;479(10):2239–2252.
17. Hagenauer G, Muehlbacher F, Ivanova M. "It's where learning and teaching begins is this relationship" – insights on the teacher-student relationship at university from the teachers' perspective. *High Educ*. 2022; <https://doi.org/10.1007/s10734-022-00867-z>
18. Hale AJ, Ricotta DN, Freed J, Smith CC, Huang GC. Adapting Ma'low's hierarchy of needs as a framework for resident wellness. *Teach Learn Med*. 2019;31(1):109–118.
19. Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student mistreatment and its association with burnout. *Acad Med*. 2014;89(5):749–754.
20. Schuchert MK. The relationship between verbal abuse of medical students and their confidence in their clinical abilities. *Acad Med*. 1998;73(8): 907–909.
21. Silver HK, Glick AD. Medical student abuse. Incidence, severity, and significance. *JAMA*. 1990;263(4):527–532.
22. Richman JA, Flaherty JA, Rospenda KM, Christensen ML. Mental health consequences and correlates of reported medical student abuse. *JAMA*. 1992;267(5):692–694.

23. Sheehan KH, Sheehan DV, White K, Leibowitz A, Baldwin DC Jr. A pilot study of medical student “abuse”. Student perceptions of mistreatment and misconduct in medical school. *JAMA*. 1990;263(4):533–537.
24. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. *Mayo Proceedings*. 2005; 80(12):1613–1622.
25. Montgomery A. The inevitability of physician burnout: implications for interventions. *Burnout Res*. 2014;1:50–56.
26. McKenna KM, Hashimoto DA, Maguire MS, Bynum WE. 4th. The missing link: connection is the key to resilience in medical education. *Acad Med*. 2016;91(9):1197–1199.
27. Lee J, Graham AV. Students’ perception of medical school stress and their evaluation of a wellness elective. *Med Educ*. 2001;35(7):652–659.
28. Mangiardi JR, Pellegrino ED. Collegiality: what is it? *B New York Acad Med*. 1992;68(2):292–296.
29. Sutkin G, Wagner E, Harris I, Schiffer R. What makes a good clinical teacher in medicine? A review of the literature. *Acad Med*. 2008;83(5):452–466.
30. Harden RM, Crosby J. AMEE Guide No 20: The good teacher is more than a lecturer: the twelve roles of the teacher. *Med Teach*. 2000;22(4):334–347.
31. Goldie J, Dowie A, Goldie A, Cotton P, Morrison J. What makes a good clinical student and teacher? An exploratory study. *BMC Med Educ*. 2015;15:40.
32. Ramani S, Leinster S. AMEE Guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347–364.
33. Sargeant J, Mann K, Manos S, Epstein I, Warren A, Shearer C, Boudreau M. R2C2 in action: testing an evidence-based model to facilitate feedback and coaching in residency. *J Grad Med Educ*. 2017;9(2): 165–170.
34. Telio S, Ajjawi R, Regehr G. The “Educational Alliance” as a framework for reconceptualizing feedback in medical education. *Acad Med*. 2015;90(5):609–614.
35. Bonet G, Walters BR. High impact practices: student engagement and retention. *College Student Journal*. 2016;50(2):224–235.
36. Umbach PD, Wawrzynski MR. Faculty do matter: the role of college faculty in student learning and engagement. *Res Higher Ed*. 2005;46(2):153–184.
37. Roffey S. Developing positive relationships in schools. In S. Roffey (Ed.), *Positive relationships: Evidence based practice across the world* (pp. 145–162). Springer. 2012.
38. Dornan T. Workplace learning. *Perspect Med Educ*. 2012;1:15–23.
39. Deketelaere A, Kelchtermans G, Struyf E, De Leyn P. Disentangling clinical learning experiences: an exploratory study on the dynamic tensions in internship. *Med Educ*. 2006;40:908–915.
40. Bing-You RG, Sproul MS. Medical students’ perceptions of themselves and residents as teachers. *Med Teach*. 1992;14(2–3):133–138.
41. Owolabi MO, Afolabi AO, Omigbodun AO. Performance of residents serving as clinical teachers: a student-based assessment. *J Grad Med Educ*. 2014;6(1):123–126.
42. Karani R, Fromme HB, Cayea D, Muller D, Schwartz A, Harris IB. How medical students learn from residents in the workplace: a qualitative study. *Acad Med*. 2014;89(3):490–496.
43. Busari JO, Scherpbier AJ. Why residents should teach: a literature review. *J Postgrad Med*. 2004;50(3): 205–210.
44. Tacci JA. The resident as teacher: a neglected role. *JAMA*. 1998;280(10):934.
45. Skjevik EP, Boudreau JD, Ringberg U., et al. Group mentorship for undergraduate medical students: a systematic review. *Perspect Med Educ*. 2020;9:272–280. doi: 10.1007/s40037-020-00610-3
46. Lin CD, Lin BY, Lin CC, Lee CC. Redesigning a clinical mentoring program for improved outcomes in the clinical training of clerks. *Med Educ Online*. 2015;20(1):28327.
47. Fleming A, Cutrer W, Moutsios S, Heavrin B, Pilla M, Eichbaum Q, Rodgers S. Building learning communities: evolution of the colleges at Vanderbilt University School of Medicine. *Acad Med*. 2013;88(9):1246–1251.

Chapter 7

Discussion and conclusion

Discussion and conclusion

In this chapter, the research questions of this dissertation as listed in Chapter 1 are addressed based on the findings of the studies described in this dissertation and compared to insights from literature. This discourse will be addressed using the following 3 themes:

- (i) burnout measurement in medical school in a non-Western setting
- (ii) burnout-related factors according to the job demands-resources model in postgraduate and undergraduate medical education, and
- (iii) cultural aspects of the non-Western Asian culture on burnout and related factors, such as sense of belonging, engagement, and collegiality.

i Burnout measurement in a non-Western setting medical school

Postgraduate medical education

In **Chapter 2**, the extent to which pediatric residents in a non-Western setting experienced burnout was described. An exploratory sequential mixed methods design was employed in this cross-sectional study. The initial, quantitative phase used the validated Maslach Burnout Inventory, the Postgraduate Hospital Educational Environment Measure (PHEEM) and Work-Related Quality of Life scale (WRQoL) to identify the correlation between burnout and educational climate. The quantitative aspect of this study revealed an interesting finding: none of the pediatric residents had significant burnout levels in *the three* dimensions of high emotional exhaustion, high depersonalization, and low personal accomplishment. However, Seventeen percent of them had high levels in two of the three factors of burnout (two-dimensional burnout risk). This finding was different from a recent meta-analysis review in 2021 of 114 studies from North America, Europe, Africa, Asia, Australia, the Middle East, and South America, which reported a 47.3% pooled prevalence of three-dimensional burnout among postgraduate medical residents.¹ Similarly, it differed from the findings of, a 2020 study among US pediatric residents that reported a burnout rate of more than 50%². Also, In France, 37% of residents reported having burnout³, compared to 15.9% in Saudi Arabia in 2019⁴. The prevalence reported among Jordan residents was strikingly high, 77.5%⁵. Although social desirability may have influenced the honesty of student responses, these differences in prevalence are likely also due to contextual factors, such as cultural differences and other factors contributing to burnout which may vary between institutions regarding job demand and resources. This shows the importance of gaining insight on related factors in the workplace that may increase or mitigate burnout.

Undergraduate medical education

Since a burnout risk assessment tool in Thai was nonexistent, we investigated the psychometric properties of the Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS), to determine the prevalence of burnout among undergraduate medical students (**Chapter 3**). The results showed adequate interrater reliability, with a Kappa of 0.83, and confirmatory factor analysis revealed good fit indices. The psychometric properties of the Thai inventory aligned with the Maslach Burnout Inventory-Student Survey (MBI-SS) in Western languages and some non-Western countries⁵⁻⁹ such as Japan and China¹⁰⁻¹¹. As a result, the Thai version of the MBI-SS was found to be sufficiently reliable and valid in this study and could be used as a wellness assessment tool. A scoping review aimed to compile a comprehensive list of validated wellness evaluation tools and questionnaires, recommending six validated questionnaires for assessing the wellness of undergraduate medical school students beyond depression and anxiety, namely; the Medical Student Stress Profile (MSSP), the Medical Student Stress Questionnaire (MSSQ), the Medical Student Well-Being Index (MSWBI), the Perceived Medical School Stress (PMSS), the Perceived Stress Scale for Medical Students (PSSMS), and the Oldenburg Burnout Inventory-Medical Student Version (OLBI-MS)¹². It consists of two dimensions: disengagement and exhaustion and its advantage are that it is more accessible than the MBI because it is free to administer¹³⁻¹⁵. It was validated with multicultural evidence of its psychometric qualities and is used globally.

In **Chapter 3** the MBI-SS was used as the questionnaire to measure burnout among medical students. There was critique on the MBI three-factor model in a study that applied structural equation modelling. The study revealed that the internal consistency and the correlation of specified emotional exhaustion and depersonalization scales were similar to what was reported originally in the literature for the MBI. This finding had consequences for the theoretical implications of the use of the two-factor model in burnout research and whether personal low personal efficacy should be excluded from the MBI-SS questionnaire¹⁶. However, the World Health Organization's 2019 definition of burnout as a legitimate work-related experience, consisted of three dimensions: emotional exhaustion, cynism, and reduced personal efficacy¹⁷. Moreover, the recent scoping review suggested that the MBI is one of the most important instruments to identify burnout syndrome and is used worldwide, especially in health care professionals¹⁸.

Another recent study concluded that the Thai Copenhagen Burnout Inventory-Student Survey (CBI-SS) was a valid and reliable tool for burnout syndrome measurement among Thai preclinical medical students¹⁹. Moreover, the Thai CBI-SS, which consisted of 4 subscales, indicated the sources of burnout, namely, personal burnout, study-related burnout, colleague-related burnout, and teacher-related burnout. Thus, the purpose of using the Thai CBI-SS was different from the MBI-SS, and the Thai CBI-SS does not align with the WHO definition.

In addition, it is important to relate any measurement of burnout within the context and the intended purpose on how to use the data. Recently in 2021, the Liaison Committee

on Medical Education (LCME) included the requirement to provide an effective system that promotes well-being and facilitates adjustment to the physical and emotional demands of medical education in their standards²⁰. The standard recommends developing a wellness system evaluation is the first step in identifying clear and measured goals over a short or long-term period. Prevalence of burnout can be measured in the short term (less than 1 year) or longitudinally after graduation, after becoming a physician. Thus, if reduction or alleviation of burnout is a goal of the institution's wellness program, then the LCME recommends using the MBI-SS or the OLBI-MS²¹.

In summary, the MBI-SS is the only tool that aligns with the WHO, and the purpose of measurements of burnout prevalence should depend on the goals of each institution's wellness program.

ii Related factors among both postgraduate and undergraduate students according to the job demands-resources model

As mentioned in **Chapter 1**, this dissertation used the job demands-resources model (JD-R model) as its theoretical framework (see Figure 7.1). Job demands refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological demand²² such as overnight shifts, and were associated with medical student burnout and well-being²³. Job resources refer to physical, psychological, social, or organizational aspects of the job that support in achieving work goals; reduce job demands and the related physiological and psychological costs; or stimulate individual growth, learning, and development²⁴⁻²⁶. Job resources can be social support from coworkers and trainers, and the freedom to make decisions. These factors may contribute to a motivational process that leads to engagement at work, which is the anti-thesis of burnout.

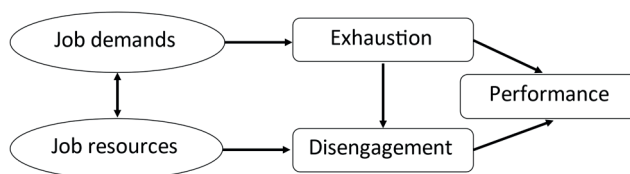


Figure 7.1 The job demands-resources model.

In this dissertation, several job demand and resources were identified and listed as related factors to burnout among non-Western Asian medical trainees (see Figure 7.2) and are explained below.

In this dissertation, job demand and resources were identified and listed as related factors to burnout among non-Western Asian medical students (see Figure 7.2).

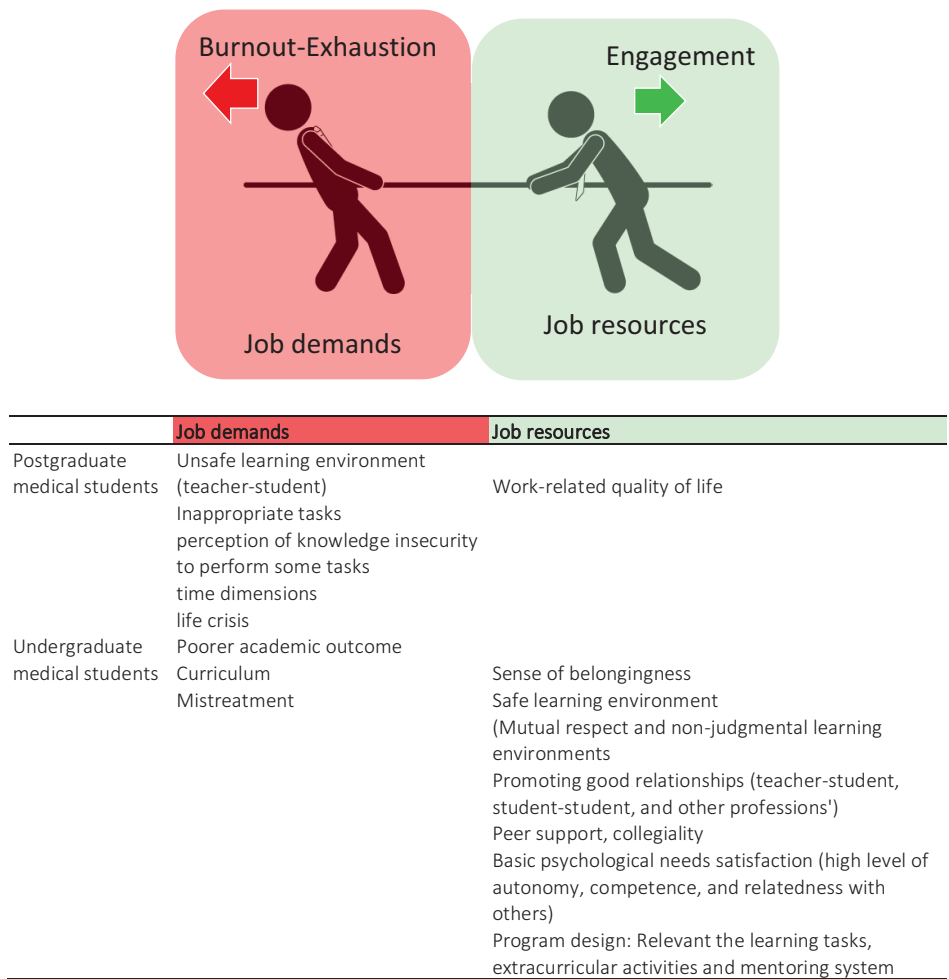


Figure 7.2 The job demands-resources factors from this dissertation, related to burnout in a non-Western Asian setting.

Chapter 2 explored factors related to burnout among pediatric postgraduate medical trainees and found that the work-related quality of life had a moderate correlation with emotional exhaustion ($r=0.401$, $p=0.009$). The burnout subscales level however, was not related to the overall medical educational environment. This is in line with the study of Meriläinen et al. that reported *no* relationship between the learning environment and burnout among university students²⁷. Alternatively, recent studies and a systematic review among post-graduate medical trainees *did* reveal significant relationships between the learning environment and burnout²⁸⁻³². The finding in the quantitative part of this chapter that burnout was not related to the educational environment could be due to the low range of high burnout levels on the different subscales and the absence

of a burnout report in Chapter 2. However, in the qualitative part of this chapter, residents reported that unsafe learning environments resulting from teachers or teaching styles was one of the factors that contributed to burnout. These findings underscore that differences in factors contributing to burnout are also present in non-Western Asian setting.

In **Chapter 3**, factors related to burnout among undergraduate medical students showed that students with poorer academic achievement are more likely to experience burnout (Figure 7.2). We hypothesized that grade point average (GPA) was significantly contributory to professional identity building in Thai medical school. Thus, students with poor GPAs might lose confidence and self-esteem. On the other hand, medical students with better GPAs may feel more relieved after meeting their academic goals, and they may become more popular and accepted among their communities, peers, teachers, and even their families. As a result, individuals may sense a higher level of personal accomplishment and, as a result, be less prone to burnout.

Chapter 4 revealed a significant but weak (negative) correlation between burnout and both the sense of belonging (relatedness with others) and work engagement among Thai undergraduate medical students. In other words, the undergraduate medical students who engaged more with their learning environment and their peers had a lower risk of burnout. Even though this chapter does not describe a true experimental study that could reveal cause and effect, the relationship between engagement and a lower risk of burnout was significant. In the literature, there were some contradictory findings about peer support and well-being. For example, a systematic review of the effects of peer support in 2018 found insufficient evidence that peer support interventions improve student well-being³³. This systematic review included only three studies and excluded qualitative studies. A study in 2021, on the other hand, found that the peer-support program was a valuable wellness resource for medical students who both used and provided the services³⁴. Another recent study found that peer support was needed as a more acceptable form of assistance in students' perceptions, and that it could strengthen social networks and support³⁵. The contradictory findings regarding the impact of peer support on students' well-being could be attributed to differences in peer support agendas and delivery across institutions. The institution should design a fit-for-purpose agenda and consider a proper delivery mode for a peer support program in order to foster students' well-being. Furthermore, more future studies are needed to draw a conclusion on the impact of peer support and burnout.

Chapter 4 also revealed that all subscales of basic psychological needs satisfaction, including perceiving a high level of autonomy, competence, and relatedness with others, were associated with a lower likelihood of having an indicator of burnout. This is similar to a previous study among PhD students in medicine, in which the essential variables that led to burnout were the frustration from basic psychological needs³⁶. This finding is

in line with basic psychological need satisfaction theory, as a critical factor in achieving better well-being³⁷⁻³⁸, and in line with a study among early-career pediatrician that showed that having support from physician colleagues, and adequate resources for patient care were associated with a lower prevalence of burnout³⁹. Thus, promoting the satisfaction of basic psychological needs may be beneficial for preventing burnout and consider as job-resources.

After the association between burnout, a sense of belonging (relatedness with others), and work engagement was confirmed, we went on to investigate for strategies to promote collegiality, engagement, and a sense of belonging from both undergraduate medical students' and faculty members' perspectives. These strategies could potentially be the cause and solution of the burnout problem.

The results of this qualitative part of **Chapter 4** indicated that the learning tasks and extracurricular activities relevant to medical students are crucial for engaging them. Also, the psychological safety of the learning environment in both the classroom and clinical workplaces, and among peers, teachers, seniors, and other health professionals strongly affected engagement and collegiality. This result is consistent with prior research findings indicating that the learning environment is a significant setting with psychosocial and material elements⁴⁰. The psychosocial dimension of the framework included the individual's interactions with others and social relationships with others, such as having a good community of peers and a good relationship with staff, which included receiving constructive feedback, comprehending the clarity of expectations, and gaining patients' trust. Students' perceptions of learning environment components included empathy, burnout, and quality of life⁴¹, and learning occurred when students were invited and involved in the learning environment⁴². The nurturing work culture, teamwork and support from the medical community can support resilience which is a key element to lower the risk of burnout⁴³. Furthermore, teacher-student relationships play a vital role in low-stakes evaluations, which foster self-regulated learning. Teachers could be made aware of their impact and encouraged to strive for approachability and meaningful contact, which could have a beneficial effect on how students view learning assessments. So, medical teachers and program administrators should focus on creating a good learning environment to help students learn, get involved, get along with each other, and stay healthy⁴⁴. In summary, **Chapter 4** emphasized that medical schools should design curricula that engage students and fulfil their basic psychological needs to promote well-being and alleviate students' burnout.

Mistreatment was considered as one of the job demands as it leads to physical and psychological costs. In **Chapter 5**, mistreatment categories were reported to be significantly associated with the risk of depression and burnout; this finding was consistent with previous studies and confirmed that mistreatment was associated with medical students' well-being in both Western and non-Western, Asian contexts⁴⁵⁻⁴⁹. The

Thai NAQ-R was constructed in **Chapter 5** and showed good validity and reliability results. The Thai NAQ-R can be used to investigate the characteristics and scope of Thailand's student mistreatment problem, and also be included in screening and monitoring mistreatment problems in each institution. This chapter revealed a significant problem of mistreatment, with 74.5% of undergraduate medical students experiencing mistreatment. The people involved in the mistreatment were senior students, attending staff, and peers. This also reflected interpersonal problems in medical school. More importantly, the risk of depression and self-reported unprofessional behavior were related to burnout. Due to the limitations of the study design, it was difficult to determine the cause and effect of the mistreated students' burnout and unprofessionalism behaviors. However, the significant relationship could raise awareness of the possibility of a negative consequence of mistreatment related to unprofessionalism. One of the interesting points added in **Chapter 5** was the discovery that mistreatment of students was related to mistreating others. This phenomenon should be thoroughly investigated whether it is a cycle of mistreatment that can infiltrate the next generation of organizational culture. This could be an alarm for health care professionals that the problem has not ended after the event but could continue through the next event. Adequate management and intervention to halt continuation and/or progression of students' mistreatment should be instituted.

Chapter 6 highlights three main themes of faculty members' perspectives of what (positively and negatively) influences undergraduate medical students' sense of belonging, engagement, and collegiality. The key factors in faculty members' perspectives were creating a safe learning environment (mutual respect and a non-judging learning environment), faculty members' actions to promote teacher-student or student-student relationships (promote relationships in the workplace, make students feel valuable, stimulate socialization, and stimulate student-student or student-resident interaction), and program design factors that promote medical students' sense of belonging (mentoring systems, extracurricular activities).

The first and second themes of the findings in **chapter 6** i.e., creating a safe learning environment and promoting teacher-student or student-student relationships, were in line with what the research says about effective clinical teaching and what makes a good clinical teacher. In previous studies, positive characteristics of clinical teachers included a value for teamwork, collegial skills, clinical reasoning, and professionalism, maintaining positive relationships and a supportive learning environment, and being personable and respectful of others⁵⁰⁻⁵³. These were considered as Job-resources which could protect medical students from burnout. Furthermore, the chapter outlines strategies that faculty members use to build this relationship, such as engaging in multi-level teaching to enhance teacher-student interaction, making students feel valued, and socialization. The teacher-student relationships are important for student engagement and well-being, which aligns with literature in higher education⁵⁴⁻⁵⁶. The positive and supportive

relationship is one of the job-resources that could diminish burnout problem. This positive relationships between students and other professionals and residents are included in the JD-R model.

In **Chapter 6**, faculty members also revealed the vital role of residents in promoting or compromising students' sense of belonging, engagement, and collegiality. For example, by engaging students in the patient care team, respecting students, and promoting a friendly atmosphere related to student collegiality. These were in line with the literature that residents need to have good teaching skills to promote understanding and good characteristics and abilities to create a supportive learning environment⁵⁷⁻⁵⁸, facilitate the process of learning and the interrelationships between them. Mentoring programs, such as the one described in **Chapter 6**, can engage students. This is consistent with the findings of a literature review, which found that such programs could engage students in research and academia, allow them to share personal problems, and allow them to socialize with their mentors. This was found to be important for the retention and recruitment of trainees in medical and surgical specialties⁵⁹⁻⁶⁰. A study among Japanese early career physician report mentorship related to lower burnout⁶¹. Also, a program that builds long-term relationships between faculty mentors and students and in which faculty mentors not only teach but also show students how to act professionally and ethically has the potential to turn the group into learning communities that encourage students to become more active, engaged, and self-motivated learners⁶². It was also found that the risks of depression and burnout were significantly associated with mistreatment categories, which was in alignment with those of previous studies, confirming that mistreatment is associated with medical students' well-being in general in both Western and Asian context⁶³⁻⁶⁷.

Chapter 6 also revealed strategies to facilitate and support sense of belonging, engagement, and collegiality in faculty opinions, which are in line with the findings in **Chapters 2–5**. The main key strategy for promoting a sense of belonging, engagement, and collegiality is to create safe learning environments through mutual respect, nonjudgmental reactions, and making students feel valuable. These strategies are in line with characteristics of good medical teachers found in the literature⁶⁸⁻⁷¹ as well with the importance of good teacher-student relations in the effective assessment for learning⁷²⁻⁷³. From the literature and the findings in **Chapter 6**, emphasis is placed on the positive impact of a safe and supportive learning environment and not only on students' well-being, learning and assessment. Moreover, **Chapter 6** showed that program directors and administrative staffs should design and implement supporting systems, such as a mentoring system or extra-curricular activities, to promote a sense of belonging, engagement, and collegiality for students. This is in line with literature findings on the effect of mentoring systems i.e. teacher-student and student-student mentorship that can help prevent burnout and improve student wellness⁷⁴⁻⁷⁶. Peer or

near peer mentor system and extracurricular activities can promote social connections of students and thus improve their well-being

In summary, the related factors among both postgraduate medical trainees and undergraduate students found in this thesis are in line with the JD-R model and can be categorized according to this model. Factors that are placed in the job demands column are those that contribute to burnout (see Figure 2.), and factors in the resource's column can counterbalance burnout and promote student well-being and engagement. Therefore, medical schools should reduce factors on the job demand side and enhance factors on the resource side to alleviate burnout problems in medical trainees. **Chapter 2** is included in table and explained the factors in job demands and resources.

iii Cultural aspects on burnout and related factors, such as sense of belonging, engagement, and collegiality

The mistreatment problem reported in **Chapter 5** was comparable to that in a Western setting, in the sense that a high prevalence was shown although the underlying factors and mechanisms might be different. In the literature, mistreatment and disrespectful behaviors are reported to be related to the culture in the medical school and characteristics of the clinical workplace, such as hierarchy, medical culture, pressure on medical students, and stressful health care environments⁷⁷⁻⁷⁸. It is however clear from a survey of the Hofstede Insights⁷⁹ that Thailand is a country with a high-power distance, different from that in a Western culture. The Thai society accepts inequalities with an observable, strict chain of command and protocol. Each rank has its privileges, and the junior employees show loyalty, respect, and deference for their superiors in return for protection and guidance. The information flow is hierarchical and controlled. This could explain the low mistreatment report rate in **Chapter 5**, which could reflect acceptance of the inequalities caused by superiors. Therefore, not only faculty members, but also residents, fellows, student peers, other health professionals, and educational staff need to be included in such programs to promote a safer learning environment to support medical students and to increase the report rate of mistreatment.

Thailand has a strongly collectivist culture⁷⁹. This is evidenced by a close, long-term commitment to the 'group' of members (a family, extended family, or extended relationships). Thai also have a collectivist culture, loyalty to the in-group takes priority over the majority of other societal rules and regulations. The culture creates close relationships in which everyone has responsibility for group members. In order to protect the in-group, Thai are not aggressive, therefore "yes" may not indicate acceptance or agreement in their speech. An offence leads to loss of face and Thai are very sensitive not to feel humiliated in front of their group. The lower GPA may cause a Thai student to feel shamed and might lead to psychological cost. Thus, this could explain that poor academic outcome or lower GPA were associated with student's burnout. Also, as mentioned above that the highly collectivist culture, relationships of the group members such as learning and working communities are crucial for Thai

people's feeling and they place a great importance on the goals of the group as their own self-image. Therefore, **Chapter 2** found that an unsafe learning environment which made students feel shamed or loss of face to their group, was reported as a cause leading to burn out. The group's view of a student's image and performance thus is an important contributor to such student's feeling and self-esteem. Also, **Chapters 4 and 6** revealed that burnout is associated with a sense of belonging, collegiality and engagement among undergraduate medical students because their culture has a loyalty to the in-group and long-term commitment to the member 'group'.

This collective and hierarchical culture could be possible reasons for not reporting a mistreatment event. The reluctance to report negative events may also be related to fear about harming a group member and lost protection and guidance from their supervisors or seniors which also support the student. Also, Thai culture is considered as a feminine society with the lowest masculinity ranking among the average Asian countries⁷⁹. This indicates a society with less assertiveness and competitiveness, as compared to the masculinity society where assertiveness and competitiveness are considered more important and significant⁷⁹. Thai also has uncertainty avoidance, which is a feeling of being threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid⁷⁹. From the feminine and uncertainty avoidance culture mentioned above, the students' assertive to report mistreatment for themselves might be compromised by the feminine culture and the uncertainty about the consequences of reporting could lead to reluctant to report the events.

In Western countries, students are hesitant to report mistreatment because of various concerns, such as the cost and the outcome of reporting, or difficulty reporting more subtle forms of mistreatment, or the process is too difficult.⁸⁰⁻⁸¹ Thus, the lack of reporting in a non-Western Asian setting might be bigger than in Western countries because of the cultural differences. As described in **Chapter 5**, only 8.2% of students had filed an official report of mistreatment to someone on the faculty. This proportion was low when compared to previous studies⁸², which found a 30% report rate. Thus, to design and implement a system for reporting mistreatment, educational staff should take the cultural aspect into account as well, such as using clear structure and consequences to reduce uncertainty and fit with the students who have low assertiveness.

Conclusions

This thesis demonstrated that the Thai version of the MBI-SS can be used to measure burnout prevalence among preclinical and clinical medical students in Thailand. A burnout problem among undergraduate medical students was revealed, with 28.4% experiencing burnout. No substantial burnout among pediatric residents in the Thai context was found.

This thesis suggests a link between burnout and the risk of depression. At the local context, these findings certainly raised awareness among medical teachers and the program director about the dangers of disengagement or burnout in medical school, which can be linked to a serious, unhealthy mental state such as an increased risk of depression.

Also, this thesis confirmed that chronic interpersonal stressors in the learning environment, such as a lack of a sense of psychological safety and negative peer interaction, were contributory to burnout among undergraduate medical students. Furthermore, satisfaction of basic psychological needs, such as increasing students' perceptions of autonomy, competence, and relatedness, as well as engaging students in the learning environment, was found to be related to burnout. As a result, interpersonal relationships between students and between students and teachers should be emphasized in order to prevent and alleviate burnout. Students reported key features that could be used to promote collegiality and the sense of belonging and engagement, in which also related to job demands and resources such as: relevant tasks and learning activities; safety in the learning environment; peer interaction; certain program design factors; and the dynamics of collegiality while progressing through medical school, as well as personal stances and social skills. These reported aspects could be integrated in the curriculum design to alleviate burnout.

From postgraduate medical trainees and undergraduate medical students' perspective, unsafe learning environment and mistreatment were present and had negative effects on promotion of collegiality and the sense of belonging and engagement. Therefore, a study about mistreatment in undergraduate medical education was subsequently done. The study showed that mistreatment among undergraduate medical students is a serious problem also in Thailand. The prevalence of mistreatment was high, with workplace learning-related bullying being the most common category. Attending staff was the most common source of mistreatment. Mistreatment was associated with several negative consequences, including burnout, depression risk, and signs of unprofessional behavior. However, the reporting of mistreatment by medical students was low. In term of the cultural context in this study, high-power distance, strong collectivist, feminine and uncertainty avoidance features were considered as a factor that could compromise the mistreatment report rate among students. The culture characteristics of a high-power distance and strong collectivist could enhance the crucial role of a supportive and safe learning environment in students' perception.

From faculty members' perspectives, the critical features to promote medical students' sense of belonging, engagement, and collegiality in relation to burnout were: creating safe learning environments (mutual respect and a non-judging learning environment); promoting teacher-student or student-student relationships by faculty members (promote relationships in the workplace; make students feel valuable; promote socialization; stimulate student-student/resident interaction); and program design factors that promote medical students' sense of belonging (mentoring system, extra-curricular activities). Importantly, both medical students and faculty members shared

the same perspectives, highlighting the importance of creating a safe learning environment and program design to allow students contact times with friends, mentors, and extracurricular activities. In relation to a safe learning environment, mistreatment in the learning environment was mentioned as a crucial factor that destroyed a positive learning environment, engagement, and student relationships in medical school.

At the undergraduate level, there was an association between burnout and depression risk. This dissertation revealed job demands and resources of undergraduate students which related to burnout such as lower academic performance (GPA), increasing a sense of belonging, collegiality, and engagement. This thesis shows evidence of a significant weak correlation between a sense of belonging, collegiality, and work engagement. So, improving students' sense of autonomy, competence, belonging, and engagement with their learning environment and peers could help solve the problem of student burnout.

At the postgraduate level, this thesis added new insight into the association between postgraduate medical students' burnout and the educational climate and work-related quality of life. In other words, addressing the widespread burnout problem among postgraduate medical students should prioritize both work-related quality of life and educational climate. These included unnecessary or duplicated workloads; extensions of regular duty hours; unclarity of role expectations or work allocation; teachers' characters and teaching styles such as aggressive verbal communication. The educational environment should be positive and supportive, with no instances of mistreatment.

The limitation of the studies in this thesis was that they were not designed as experimental studies to identify the cause and effect of burnout, depression, mistreatment, and related factors. Consequently, further experimental studies are needed to explore cause and effect. Despite this limitation, the finding is alarming, showing the possible impact of burnout and negative consequences that lead to mental illness. Thus, alleviating burnout is important and needs attention.

Future research such as experimental studies or replication studies might be useful to confirm cause and effect in other non-Western Asian populations. Moreover, a future study on the impact of cultural differences on students' well-being, mistreatment problems, and reporting systems should be done.

The conclusions of the studies in this thesis may lead to implementation, potential application and benefits for society or medical education fields, and future research suggestions, which are stated in the impact paragraph section.

References

1. Naji L, Singh B, Shah A, Naji F, Dennis B, Kavanagh O, Banfield L, Alyass A, Razak F, Samaan Z, Profetto J, Thabane L, Sohani ZN. *Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression*. CMAJ Open. 2021 Mar 8;9(1):E189-E200. doi: 10.9778/cmajo.20200068. PMID: 33688027; PMCID: PMC8034324.
2. Kemper KJ, Schwartz A, Wilson PM, Mahan JD, Schubert CJ, Staples BB, McClafferty H, Serwint JR, Batra M; PEDIATRIC RESIDENT BURNOUT-RESILIENCE STUDY CONSORTIUM. Burnout in Pediatric Residents: Three Years of National Survey Data. *Pediatrics*. 2020 Jan;145(1):e20191030. doi: 10.1542/peds.2019-1030. Epub 2019 Dec 16. PMID: 31843859.
3. Treluyer L, Tourneux P. Burnout among paediatric residents during the COVID-19 outbreak in France. *Eur J Pediatr*. 2021 Feb;180(2):627-633. doi: 10.1007/s00431-020-03907-x. Epub 2021 Jan 7. PMID: 33410942; PMCID: PMC7788161.
4. Dahmash AB, Alajmi MF, Aldayel AY, Alotaibi YT, Altoum SM, Alzayed A, Jabari MA. Burnout and Associated Risk Factors in Pediatric Residents. *Ochsner J*. 2021 Summer;21(2):152-157. doi: 10.31486/toj.20.0037. PMID: 34239374; PMCID: PMC8238103.
5. Schaufeli WB, Martinez IM, Pinto AM, Salanova M, Bakker AB. Burnout and engagement in university students: a cross-National Study. *J Cross-Cult Psychol*. 2002;33:464-81
6. Carlotto MS, Nakamura AP, Câmara SG. Síndrome de Burnout em estudantes universitários da área da saúde. *Psico*. 2006;37:57-62.
7. Maroco J, Tecedeiro M, Martins P, Meireles ANAO. Burnout como factor hierárquico de 2a ordem da Escala de Burnout de Maslach. *Análise Psicológica*. 2008;4:639-49.
8. Maroco J, Tecedeiro M. Maslach burnout inventory - student survey: Portugal-Brazil cross-cultural adaptation. *Psicol Saúde Doenças*. 2009;10:227-35.
9. Dyrbye LN, Massie FS, Eacker A, Harper W, Power D, Durning SJ, et al. Relationship between burnout and professional conduct and attitudes among US medical students. *JAMA*. 2010;304:1173.
10. Hu Q, Schaufeli WB. The factorial validity of the Maslach burnout inventory-student survey in China. *Psychol Rep*. 2009;105:394-408.
11. Tsubakita T, Shimazaki K. Constructing the Japanese version of the Maslach Burnout Inventory-Student Survey: Confirmatory factor analysis. *Jpn J Nurs Sci*. 2016;13(1):183-8. doi: 10.1111/jjns.12082. Epub 2015 May 24. PMID: 26011741.
12. Haykal KA, Pereira L, Power A, Fournier K. Medical student wellness assessment beyond anxiety and depression: A scoping review. *PLoS One*. 2022;17(10):e0276894. doi: 10.1371/journal.pone.0276894. PMID: 36301973; PMCID: PMC9612562.
13. Demerouti E, Demerouti E, Bakker AB, Vardakou I, Kantas A. The Convergent Validity of Two Burnout Instruments. *Eur J Psychol Assess*. 2003; 19: 12-23. <https://doi.org/10.1027//1015-5759.19.1.12> 8.
14. Demerouti, E., & Bakker, A. B. (2008). The Oldenburg Burnout Inventory: A Good Alternative to Measure Burnout and Engagement. In *Handbook of Stress and Burnout in Health Care* (pp. 65-78).
15. Reis D, Xanthopoulou D, Tsaousis I. Measuring job and academic burnout with the Oldenburg Burnout Inventory (OLBI): Factorial invariance across samples and countries. *Burn Res*. 2015; 2: 8-18. <https://doi.org/10.1016/j.burn.2014.11.001>
16. Kalliath T, O'Driscoll M, Gillespie D, Bluedorn A. A test of the Maslach Burnout Inventory in three samples of health professionals. *Work Stress*. 2000; 14: 35-50.
17. WHO International Classification of Diseases. 2019. [https:// www. who. int/mental_ health/ evide nce/ burn- out/ en/](https://www.who.int/mental_health/evidence/burn-out/en/) Accessed 11Feb2023.
18. Soares JP, Lopes RH, Mendonça PBS, Silva CRDV, Rodrigues CCFM, Castro JL. Use of the Maslach Burnout Inventory Among Public Health Care Professionals: Protocol for a Scoping Review. *JMIR Res Protoc*. 2022;11(11):e42338. doi: 10.2196/42338. PMID: 36318252; PMCID: PMC9667379.
19. Wongtrakul W, Dangprapai Y, Saisavoey N, Sa-Nguanpanich N. Reliability and validity study of the Thai adaptation of the Copenhagen Burnout Inventory-Student Survey (CBI-SS) among preclinical medical students at the Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand. *PLoS One*. 2021 Dec 30;16(12):e0261887. doi: 10.1371/journal.pone.0261887. PMID: 34969041; PMCID: PMC8717990.
20. Standards, Publications, & Notification Forms. LCME.<http://lcme.org/publications/#Standards>.

21. Caceres JW, Lizotte-Waniewski M. Addressing Medical Student Wellness Over the Long Term: How Should We Be Evaluating Wellness Programs? *Med Sci Educ.* 2021 Jan 11;31(2):877-878. doi: 10.1007/s40670-020-01194-7. PMID: 34457928; PMCID: PMC8368829.
22. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *Journal of Applied Psychology.* 2001;86:499–512.
23. Dyrbye LN, Thomas MR, Harper W, Massie FS Jr, Power DV, Eacker A, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. The learning environment and medical student burnout: a multicentre study. *Med Educ.* 2009 Mar;43(3):274-82.
24. Lobas JG. Leadership in academic medicine: capabilities and conditions for organizational success. *Am J Med.* 2006;119:617–21.
25. Arora S, Ashrafian H, Davis R, Athanasiou T, Darzi A, Sevdalis N. Emotional intelligence in medicine: a systematic review through the context of the ACGME competencies. *Med Educ.* 2010;44:749–64.
26. Uchino R, Yanagawa F, Weigand B, Orlando JP, Tachovsky TJ, Dave KA, et al. Focus on emotional intelligence in medical education: from problem awareness to system-based solutions. *Int J Acad Med.* 2015;1:9–20.
27. Meriläinen M. Factors affecting study-related burnout among Finnish university students: teaching-learning environment, achievement motivation and the meaning of life. *Qual High Educ.* 2014;20(3): 309–29.
28. van Vendeloo, S.N., Godderis, L., Brand, P.L.P. et al. Resident burnout: evaluating the role of the learning environment. *BMC Med Educ.* 2018;18, 54.
29. van Vendeloo SN, Prins DJ, Verheyen CCPM, Prins JT, van den Heijcant F, van der Heijden FMMA, Brand PLP. The learning environment and resident burnout: a national study. *Perspect Med Educ.* 2018;7(2):120-125. doi: 10.1007/s40037-018-0405-1. PMID: 29476425; PMCID: PMC5889377.
30. Chew QH, Cleland J, Sim K. Burn-out and relationship with the learning environment among psychiatry residents: a longitudinal study. *BMJ Open.* 2022;12:e060148.
31. Grech M. The Effect of the Educational Environment on the rate of Burnout among Postgraduate Medical Trainees - A Narrative Literature Review. *J Med Educ Curric Dev.* 2021; 31;8:23821205211018700. doi: 10.1177/23821205211018700. PMID: 34104789; PMCID: PMC8170339.
32. Maghbouli N, Fatehi F, Mafinejad MK, Pourhassan S, Sohrabpour AA, Ali JH. Burnout and clinical learning environment among residents in Tehran: A cross-sectional study. *Heliyon.* 2021 Jun 8;7(6):e07238. doi: 10.1016/j.heliyon.2021.e07238. PMID: 34189297; PMCID: PMC8215171
33. John N, Page O, Martin S, Whittaker P. Impact of peer support on student mental well-being: a systematic review. *Med Ed Publish.* 2018;3:32.
34. Abrams MP, Salzman J, Espina Rey A, Daly K. Impact of Providing Peer Support on Medical Students' Empathy, Self-Efficacy, and Mental Health Stigma. *Int J Environ Res Public Health.* 2022 Apr 23;19(9):5135. doi: 10.3390/ijerph19095135. PMID: 35564535; PMCID: PMC9099875.
35. Bhugra D, Molodynski A, Ventriglio A. Well-being and burnout in medical students. *Ind Psychiatry J.* 2021 Jul-Dec;30(2):193-197. doi: 10.4103/ipj.ipj_224_21. Epub 2021 Nov 23. PMID: 35017800; PMCID: PMC8709508.
36. Kusrurkar RA, van der Burgt SME, Isik U, Mak-van der Vossen M, Wilschut J, Wouters A, et al. Burnout and engagement among PhD students in medicine: the BEeP study. *Perspect Med Educ.* 2021;10: 110 7.
37. Ryan RM, Deci EL. Self-determination theory: basic psychological needs in motivation, development, and wellness. New York, NY. London: Guilford Press; 2017.
38. Neufeld A, Malin G. Exploring the relationship between medical student basic psychological need satisfaction, resilience, and well-being: a quantitative study. *BMC Med Educ.* 2019;19:405.
39. Robins TG, Roberts RM, Sarris A. Burnout and engagement in health profession students: the relationships between study demands, study resources and personal resources. *Australas J Organ Psychol.* 2015;8:e1.
40. Gruppen LD, Irby DM, Durning SJ, Maggio LA. Conceptualizing learning environments in the health professions. *Acad Med.* 2019;94(7):969–74.
41. Dornan T. Workplace learning. *Perspect Med Educ.* 2012;1:15-23
42. Hägg-Martinell A, Hult H, Henriksson P, Kiessling A. Medical students' opportunities to participate and learn from activities at an internal medicine ward: an ethnographic study. *BMJ Open.* 2017;7(2):e013046.

43. Roslan NS, Yusoff MSB, Morgan K, Ab Razak A, Ahmad Shauki NI. What Are the Common Themes of Physician Resilience? A Meta-Synthesis of Qualitative Studies. *Int J Environ Res Public Health*. 2022 Jan 1;19(1):469. doi: 10.3390/ijerph19010469. PMID: 35010729; PMCID: PMC8744634.
44. Schut S, van Tartwijk J, Driessen E, van der Vleuten C, Heeneman S. Understanding the influence of teacher–learner relationships on learners' assessment perception. *Adv in Health Sci Educ*. 2020;25:441–56.
45. Elnicki D, Ogden P, Wu for the PAMS Group E. Medical student abuse from multiple perspectives. *Clin Teach*. 2007; 4(3): 153–158. doi:10.1111/j.1743-498x.2007.00168.x
46. Cook A, Arora V, Rasinski K, Curlin F, Yoon J. The prevalence of medical student mistreatment and its association with burnout. *Acad Med*. 2014; 89(5): 749–754. doi:10.1097/acm.0000000000000204
47. Brandford E, Hasty B, Bruce J et al. Underlying mechanisms of mistreatment in the surgical learning environment: A thematic analysis of medical student perceptions. *Am J Surg*. 2018; 215(2): 227–232. doi:10.1016/j.amjsurg.2017.10.042
48. Frank E, Carrera J, Stratton T, Bickel J, Nora L. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ*. 2006; 333(7570): 682. doi:10.1136/bmj.38924.722037.7c
49. Frank E, Dingle AD. Self-reported depression and suicide attempts among U.S. women physicians. *Am J Psychiatry*. 1999; 156(12): 1887–1894. doi:10.1176/ajp.156.12.1887
50. Sutkin, Gary MD; Wagner, Elizabeth; Harris, Ilene PhD; Schiffer, Randolph MD What Makes a Good Clinical Teacher in Medicine? A Review of the Literature, *Academic Medicine*: May 2008 - Volume 83 - Issue 5 - p 452–466
51. R.M. Harden, Joy Crosby (2000) AMEE Guide No 20: The good teacher is more than a lecturer - the twelve roles of the teacher, *Medical Teacher*, 22:4, 334–347, DOI: 10.1080/014215900409429.
52. Goldie J, Dowie A, Goldie A, Cotton P, Morrison J. What makes a good clinical student and teacher? An exploratory study. *BMC Med Educ*. 2015 Mar 10;15:40. doi: 10.1186/s12909-015-0314-5. PMID: 25889447; PMCID: PMC4358722.
53. Ramani S, Leinster S. AMEE Guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347–64. doi: 10.1080/01421590802061613. PMID: 18569655
54. Bonet, G., & Walters, B. R. (2016). High impact practices: Student engagement and retention. *College Student Journal*, 50(2), 224–235.
55. Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education*, 46(2), 153–184. <https://doi.org/10.1007/s11162-004-1598-1>.
56. Roffey, S. (2012). Developing positive relationships in schools. In S. Roffey (Ed.), *Positive relationships: Evidence based practice across the world* (pp. 145–162). Springer
57. Owolabi MO, Afolabi AO, Omigbodun AO. Performance of residents serving as clinical teachers: a student-based assessment. *J Grad Med Educ*. 2014;6(1):123–126.
58. Karani R, Fromme HB, Cayea D, Muller D, Schwartz A, Harris IB. How medical students learn from residents in the workplace: a qualitative study. *Acad Med*. 2014;89(3):490–496.
59. Skjevik, E.P., Boudreau, J.D., Ringberg, U. et al. Group mentorship for undergraduate medical students— a systematic review. *Perspect Med Educ* 9, 272–280 (2020). <https://doi.org/10.1007/s40037-020-00610-3>
60. Lin CD, Lin BY, Lin CC, Lee CC. Redesigning a clinical mentoring program for improved outcomes in the clinical training of clerks. *Med Educ Online*. 2015;20(1):28327.
61. Perumalswami CR, Takenoshita S, Tanabe A, Kanda R, Hiraike H, Okinaga H, Jagsi R, Nomura K. Workplace resources, mentorship, and burnout in early career physician-scientists: a cross sectional study in Japan. *BMC Med Educ*. 2020 Jun 3;20(1):178. doi: 10.1186/s12909-020-02072-x. PMID: 32493497; PMCID: PMC7268538.
62. Fleming A, Cutrer W, Moutsios S, Heavrin B, Pilla M, Eichbaum Q, Rodgers S. Building learning communities: evolution of the colleges at Vanderbilt University School of Medicine. *Acad Med*. 2013;88(9):1246–51. doi: 10.1097/ACM.0b013e31829f8e2a. PMID: 23887019.
63. Cook A, Arora V, Rasinski K, Curlin F, Yoon J. The prevalence of medical student mistreatment and its association with burnout. *Acad Med*. 2014;89(5):749–54. doi:10.1097/acm.0000000000000204

64. Frank E, Carrera J, Stratton T, Bickel J, Nora L. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ*. 2006;333(7570):682. doi:10.1136/bmj.38924.722037.7c
65. Elnicki D, Ogden P, Wu E, for the PAMS Group. Medical student abuse from multiple perspectives. *Clin Teach*. 2007;4(3):153-8. doi:10.1111/j.1743-498x.2007.00168.x
66. Brandford E, Hasty B, Bruce J, Merrell SB, Shipper ES, Lin DT, et al. Underlying mechanisms of mistreatment in the surgical learning environment: a thematic analysis of medical student perceptions. *Am J Surg*. 2018;215(2):227-32.
67. Frank E, Dingle AD. Self-reported depression and suicide attempts among U.S. women physicians. *Am J Psychiatry*. 1999;156(12):1887-94.
68. Sutkin, G., Wagner, E., Harris, I., & Schiffer, R. What makes a good clinical teacher in medicine? A review of the literature. *Acad Med*. 2008;83(5):452-466.
69. Harden, R.M. & Crosby, J. AMEE Guide No 20: The good teacher is more than a lecturer: the twelve roles of the teacher. *Med Teach*. 2000;22(4):334-347. doi: 10.1080/014215900409429.
70. Goldie, J., Dowie, A., Goldie, A., Cotton, P., & Morrison, J. What makes a good clinical student and teacher? An exploratory study. *BMC Med Educ*. 2015;15:40. doi: 10.1186/s12909-015-0314-5. PMID: 25889447; PMCID: PMC4358722.
71. Ramani, S. & Leinster, S. AMEE Guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347-364. doi: 10.1080/01421590802061613. PMID: 18569655
72. Sargeant, J., Mann, K., Manos, S., Epstein, I., Warren, A., Shearer, C., & Boudreau, M. R2C2 in action: testing an evidence-based model to facilitate feedback and coaching in residency. *J Grad Med Educ*. 2017;9(2):165-170. doi: 10.4300/JGME-D-16-00398.1. PMID: 28439347; PMCID: PMC5398131.
73. Telio, S., Ajjawi, R., & Regehr, G. The "Educational Alliance" as a framework for reconceptualizing feedback in medical education. *Acad Med*. 2015;90(5):609-614 doi: 10.1097/ACM.0000000000000560
74. Murr AH, Miller C, Papadakis M. Mentorship through advisory colleges. *Acad Med*. 2002;77(11):1172-3. doi: 10.1097/00001888-200211000-00042. PMID: 12431954.
75. Jordan J, Watcha D, Cassella C, Kaji AH, Trivedi S. Impact of a Mentorship Program on Medical Student Burnout. *AEM Educ Train*. 2019;23;3(3):218-25. doi: 10.1002/aet2.10354. PMID: 31360814; PMCID: PMC6637010.
76. Fishman JA. Mentorship in academic medicine: Competitive advantage while reducing burnout? *Health Sciences Review*. 2021;1-5.
77. Leape L, Shore M, Dienstag J, Mayer RJ, Edgman-Levitan S, Meyer GS, et al. Perspective: a culture of respect, part 1: the nature and causes of disrespectful behavior by physicians. *Acad Med*. 2012;87(7):845-52. doi:10.1097/acm.0b013e318258338d
78. Shamim MS, Baig L, Torda A, Balasooriya C. Culture and ethics in medical education: the Asian perspective. *J Pak Med Assoc*. 2018;68(3):444-6.
79. Hofstede insights [Internet]. Helsinki (Finland); [cited 2023 Jan 5]. Available from: <https://www.hofstede-insights.com/country/thailand/>
80. Bell A, Cavanagh A, Connolly CE, Walsh A, Vanstone M. Why do few medical students report their experiences of mistreatment to administration? *Med Educ*. 2021;55(4):462-70. doi: 10.1111/medu.14395.
81. Chung MP, Thang CK, Vermillion M, Fried JM, Uijtdehaage S. Exploring medical students' barriers to reporting mistreatment during clerkships: a qualitative study. *Med Educ Online*. 2018;23(1):1478170. doi: 10.1080/10872981.2018.1478170. PMID: 29848223; PMCID: PMC5990956.
82. Mavis B, Sousa A, Lipscomb W, Rappley M. Learning about medical student mistreatment from responses to the Medical School Graduation Questionnaire. *Acad Med*. 2014;89(5):705-11. doi:10.1097/acm.0000000000000199

Impact paragraph

In this paragraph, the thesis' relevance and influence on stakeholders and broader society are discussed.

Relevance

This thesis' findings may be relevant to several stakeholders in non-Western Asian medical school communities, such as undergraduate medical students, postgraduate medical students, health professionals, faculty members, and program directors. Burnout occurs in the whole continuum of medical education and can affect everybody involved in these learning environments. Burnout was observed among postgraduate and undergraduate medical students, with negative consequences for their well-being such as depression and quality of life. To understand this problem, related factors that could contribute to burnout were explored. In this thesis, factors relevant to postgraduate medical students' burnout included unnecessary or duplicated workloads; time schedule arrangements to avoid extension of regular duty hours; the clarity of role expectations; work allocation; perceptions of teacher roles; the institution of a faculty development program; and improvement of the facilities and infrastructure, such as accommodation. These factors are linked to the roles and tasks of a program director, teachers, and program managers and staffs, who design, deliver, manage and/or facilitate the curriculum because they are the key individuals who take responsibility and help alleviate these issues.

Among undergraduate medical students, students reported key features that could be used to promote collegiality and the sense of belonging and engagement: relevant tasks and learning activities; safety in the learning environment; peer interaction; certain program design factors; and the dynamics of collegiality while progressing through medical school, as well as personal stances and social skills. From faculty members' perspectives, the critical features to promote medical students' sense of belonging, engagement, and collegiality in relation to burnout were: creating safe learning environments; promoting teacher-student or student-student relationships by faculty members; and program design factors that promote medical students' sense of belonging. Thus, these findings are relevant to program directors, educational leaders, program managers and staffs, teachers, as well as other health professionals in the learning environment and residents.

In addition, this thesis addressed the mistreatment problems among undergraduate medical students, with workplace learning-related bullying being the most common category and teachers being the most common source of mistreatment. Several negative consequences, including burnout, depression risk, and unprofessionalism, were related to mistreatment. Therefore, it is relevant for faculty members and educational leaders to find a solution and a proper prevention, screening, and reporting system for mistreatment in order to eliminate mistreatment in medical school.

Stakeholders that can benefit and are involved in this thesis findings

Medical students

This thesis raised awareness about burnout among postgraduate and undergraduate medical trainees and its consequences. Undergraduate medical students should be able to detect their own symptoms of burnout early and seek help if needed. As a finding in this thesis, promoting a sense of belonging, collegiality, and engagement was related to burnout. Medical students needed support and guidance from medical teachers and staffs to promote their sense of belonging, collegiality, and engagement in the learning community. Social skills, social stance, and the dynamics of the peer relationship reported in this thesis could help medical students understand how to promote collegiality in medical school. Also, mistreatment and the reporting system were addressed as problems for which interventions were needed. They should help in finding suitable interventions, like a system for reporting mistreatment that works for them in terms of being easy to report or contributing to decreasing incidence.

Medical teachers

Several factors were reported to contribute to or relieve burnout problems related to faculty members and are reported in this thesis, such as creating supportive teachers' roles and tasks, a safe learning environment, respecting students, enhancing the teacher-student or student-student relationship, making students feel valuable, and including students in the patient care team, to benefit both students' learning and well-being. In addition, faculty development programs will need to address this issue, as well as the development of a safe and clear mistreatment reporting system with systematic management.

Other health professionals

Other health professionals, such as nurses and residents, were identified in this thesis as crucial individuals in promoting medical students' sense of belonging, collegiality, engagement, and mistreatment. It will be helpful to inform and raise awareness of their roles and impact on medical students' learning and well-being. This may change their mindset about medical education although one needs to be mindful of the prioritization of busy daily health care services. Also, residents are essential partners for engaging students in the patient care team and for promoting a friendly atmosphere contributing to student collegiality. Thus, residents could be considered for inclusion in the future development of a resident-as-teacher program.

Program directors, administrative staff, and leaders

Resident Educational leaders should thus be aware of the impact of curriculum design and system regarding its support of students' well-being, and could establish policies

and guidelines in this regard as well as provide funding and resources for its implementation or change.

Medical education researchers

This thesis provided four tools in Thai, namely: 1) The Maslach Burnout Inventory-Student Survey (the MBI-SS), to measure burnout among undergraduate medical students. 2) The Postgraduate Hospital Educational Environment Measure (PHEEM) 3) The Basic Psychological Need Satisfaction at Work Scale (BPNSS-21) to measure important needs of medical students 4) the Utrecht Work Engagement Scale—Student Version (UWESS-9) to assess medical students' engagement. This thesis provides evidence that all the questionnaires fit the context of the Thai medical student. Therefore, these are useful for Thai medical education researchers to further investigate burnout, learning environment, basic psychological need satisfaction, and engagement in Thai medical students' context.

Furthermore, we identified the following potential future research topics in this thesis:

- Teaching styles and a safe learning climate in a non-Western context
- Associated factors contributing to depression in medical students
- Faculty development programs to create good teachers' characteristics
- Residents' key roles in promoting medical students' sense of belonging, engagement, and collegiality, and the resident-as-teacher program
- Mentoring systems, extra-curricular activities, and curriculum redesign related to burnout
- A system for reporting and managing mistreatment
- other stakeholders that might influence students' sense of belonging, engagement, and collegiality, such as other health professions or residents.

Society

As burnout started as early as in medical school, if the problem wasn't solved in medical school, the burnout rate among physicians could increase. Thus, the consequences of burnout could rise in the future, with negative consequences for the physician, society and the healthcare system, such as physician mental health and health problems, patient safety, medical errors, unprofessional behavior by physicians, and physician resignation rates. Therefore, alleviating burnout through prevention and capturing this problem as early as possible in medical schools is important, and we recommend that all stakeholders get involved by promoting a sense of belonging, collegiality, and engagement.

Access to findings of this thesis

The target groups mentioned above can access three papers from this thesis that are available as published manuscripts (Chapters 2, 3 and 4); all are open access.

- *Chapter 2: BMC Medical Education 2019;19(1):245*
- *Chapter 3: International Journal of Medical Education. 2019;10:223-229*
- *Chapter 4: BMC Medical Education 2022;22(1):327*

Chapters 5 and 6 are still under peer review.

Some of these target groups have already seen the content in this thesis at national and international conferences — the annual conference of the Association for Medical Education in Europe (AMEE).

- *Chapter 2: Poster round, AMEE 2017*
- *Chapter 3: Poster round, AMEE 2018*
- *Chapter 4: Short Communications: AMEE 2020 (virtual)*
- *Chapter 5: Short communication: AMEE 2022*
- *Chapter 6: Short communication: AMEE 2022 (virtual)*

After the defense, this thesis will be made publicly available online.

Summary

Chapter one

This thesis begins by addressing the burnout problems in medical schools at both the undergraduate and postgraduate levels from the literature. Burnout is a syndrome related to a person's job and consists of three domains: high emotional exhaustion, high depersonalization, and low personal accomplishment. The problem is global and cross-cultural, with extensive studies in Western countries. The thesis explored the magnitude of the burnout problems and related factors among postgraduate medical students (**Chapter 2**) and among undergraduate medical students (**Chapter 3**). Since there is no burnout screening tool for undergraduate medical students in Thai, **Chapter 3** was also developed and tested for its psychometric properties. In **Chapter 1**, literature proposed an intervention to reduce burnout: promote a sense of belonging, collegiality, and engagement. Therefore, **Chapter 4** aimed to 1) explore relationships between burnout, sense of belonging, and work engagement; and 2) identify ways to promote collegiality, engagement, and sense of belonging in an undergraduate learning setting. From **Chapters 2 and 4**, results indicated an unsafe learning environment and mistreatment problems among undergraduate medical students. Thus, **Chapter 5** explored the magnitude of mistreatment in the undergraduate learning environment. In **Chapters 2 and 4**, it is revealed that faculty members were crucial, related to the burnout problem, and contributed to promoting a sense of belonging, collegiality, and engagement. In **Chapter 6**, faculty members reflected on how to promote a sense of belonging, collegiality, and engagement in relation to reducing burnout.

Chapter two

We explored the magnitude of burnout problems among non-Western pediatric residents and answered the question: "To what extent do pediatric residents in a non-Western setting experience burnout?" And what is the relation between burnout and personal characteristics of residents' learning environment and work-related quality of life, as well as factors that inhibit and promote burnout among residents? Two phases were conducted. The first phase was a survey using the validated Maslach Burnout Inventory questionnaire (the MBI-HS), the Postgraduate Hospital Educational Environment Measure (PHEEM), and the Work-Related Quality of Life scale. Forty-one Thai pediatric residents participated in the study, and none had high levels of burnout in all three domains. Seventeen percent show high levels in two out of three domains. This chapter found that emotional exhaustion and the learning environment were linked to work-related quality of life. In the second phase, the pediatric residents with high levels on the burnout subscales were individually interviewed. Participants reflected on the main reasons that led to their burnout, including inappropriate tasks, teachers, and teaching styles; the perception of knowledge insecurity relating to task performance; time dimensions; life crises during training; role expectations and work allocation;

clarity; and facilities. In **Chapter 2**, suggested strategies to reduce burnout are as follows: minimize unnecessary workloads; use time schedule management to avoid extra-duty working hours; clarify role expectations; and create a safe learning environment. The problem of mistreatment was identified and suggested for further investigation.

Chapter three

Since there is no validated burnout screening tool in Thai, a Thai version of the MBI-SS with sufficient psychometric properties would guarantee the accurate measurement of burnout among undergraduate medical students and improve understanding of burnout in medical students in non-Western countries. In **Chapter 3**, a Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS) was developed and tested for its psychometric properties. This chapter aims to answer the question RQ2: "What are the psychometric properties of the Thai version of the Maslach Burnout Inventory-Student Survey (MBI-SS) and is the occurrence of burnout and its subscales potentially correlated with depression, years of training, gender, and grade point average (GPA) among Thai undergraduate medical students?" This MBI-SS Thai version had adequate properties among Thai undergraduate medical students and can be used to assess burnout. Subsequently, a self-report survey to explore the prevalence of burnout and related factors was distributed. Twenty-eight percent of medical students experienced burnout. A depression risk questionnaire, named the PHQ-9, was used to identify depression risk and its relationship with burnout. The prevalence of burnout (as identified by the three subscales of low personal accomplishment, high emotional exhaustion, and high depersonalization) was 28%. This study suggests that students of the male gender with lower academic performance were at higher risk of burnout. Evidence of a correlation between burnout and depression was also demonstrated in this chapter. Further studies on other associated factors contributing to burnout and the risk for depression in a non-Western context are needed to provide more insights and facilitate the transfer of potential solutions to alleviate these interlinked problems.

Chapter four

From the literature, an intervention creating a sense of belonging, engagement, and collegiality has been proposed as a new approach for alleviating burnout. However, the evidence of relationships between burnout and the new intervention approaches that create a sense of belonging, engagement, and collegiality in a non-Western context is limited. This chapter will attempt to address two RQs (RQs 3 and 4): (RQ3) To what extent is burnout related to a sense of belonging (relatedness with others) and work engagement for undergraduate medical students? (RQ4) What are the key elements that undergraduate medical students perceive as positively or negatively contributing to promoting collegiality, engagement, and a sense of belonging? An exploratory sequential mixed-methods design using questionnaires and semi-structured individual interviews collected quantitative and qualitative data among undergraduate medical students at

Mahidol University, Thailand. The Maslach Burnout Inventory-Student Survey questionnaire was used to measure burnout. The Basic Psychological Need Satisfaction at Work Scale (BPNSS-21) and the Utrecht Work Engagement Scale—Student Version (UWESS-9) measured students' basic psychological needs satisfaction at work and work engagement, respectively. Thai versions of the BPNSS-21 and UWESS-9 showed an acceptable fit for the Thai cultural context. A sense of belonging, engagement, and collegiality were related to burnout. Burnout had significant weak inverse associations with engagement ($r = 0.39$, $p 0.005$) and basic psychological needs satisfaction ($r = 0.37$, $p 0.005$). Sense of belonging had a significant but weak inverse relationship with burnout ($r = 0.25$, $p 0.005$). Twenty undergraduate medical students participated in the qualitative study. The key features for promoting collegiality, a sense of belonging, and engagement were relevant tasks and learning activities; safety in the learning environment; peer interaction; program design factors; the dynamics of collegiality while progressing through medical school; and personal stance and social skills. This chapter answers the RQs 3, 4, and 5 and provides two validated tools, namely the Thai versions of the BPNSS-21 and UWESS-9, to assess students' basic psychological needs for satisfaction at work and work engagement, respectively.

Chapter five

From research questions 1 and 4, findings revealed the psychological safety of the learning environment and mistreatment as crucial factors that influence the sense of belonging, engagement, and collegiality of undergraduate medical students. Therefore, the research question in **Chapter 5** was posed to explore the extent and nature of burnout and mistreatment as well as the characteristics and related behavior of mistreated students. 5. The RQ5 was: "What are the relationships between burnout and mistreatment, including the prevalence, recurrence, categories, reporting actions, mistreated persons, related behavior, and well-being of medical students in non-Western, Asian contexts?" Mistreatment is a behavior that reflects disrespect for the dignity of others, can be intentional or unintentional, and can interfere with the process of learning or perceptions of well-being. We first developed a Thai version of the Clinical Workplace Learning Negative Acts Questionnaire—Revised (NAQ-R) using the forward-back translation process with quality analysis. The design was a cross-sectional survey study. The survey comprised the Thai Clinical Workplace Learning NAQ-R, Thai Maslach Burnout Inventory-Student Survey, Thai Patient Health Questionnaire (to assess depression risk), demographic information, mistreatment characteristics, mistreatment reports, related factors, and consequences. In total, 681 medical students (52.4% female, 54.6% in the clinical years) completed the survey (79.1% response rate). The Thai Clinical Workplace Learning NAQ-R was acceptable for use among Thai medical students. Most participants ($n = 510$, 74.5%) had been mistreated. The most common type was workplace learning-related bullying (67.7%), and the most common source was attending staff or teachers (31.6%). The reported behavior of students was low, with

only 56 students (8.2%) reporting these mistreatment events to others. The academic year was a significant factor related to workplace learning-related bullying. Depression and burnout risk were significantly associated with person-related bullying. Students who experienced person-related bullying were more likely to file unprofessional behavior reports, which included having a conflict or argument with colleagues, being absent from class or work without reasonable cause, and mistreating others. This chapter answered the RQ5 that mistreatment of medical students was evident in medical school and related to the risks of depression, burnout, and unprofessional behavior. This chapter also includes a Thai-validated version of the Clinical Workplace Learning Negative Acts Questionnaire-Revised (NAQ-R) for further mistreatment assessment in Thai medical schools.

Chapter six

Faculty members are a crucial part of the learning environment and program design, which enhances a sense of belonging, engagement, and collegiality. However, studies exploring faculty members' perspectives regarding strategies to enhance a sense of belonging, engagement, and collegiality were limited. **Chapter 6** aims to answer the RQ6: What do faculty members perceive are the most important things that affect (both positively and negatively) an undergraduate medical student's sense of belonging, engagement, and collegiality? A qualitative study design was applied to explore faculty members' perceptions of promoting or inhibiting a sense of belonging, engagement, and collegiality among undergraduate medical students. Twenty full-time faculty members participated in the interviews. They expressed their perceptions on how faculty contribute to cultivate a sense of belonging, engagement, and collegiality as follows: creating safe learning environments (mutual respect and a non-judging learning environment); promoting teacher-student or student-student relationships by faculty members (promote relationships in the workplace; make students feel valuable; promote socialization; stimulate student-student or resident interaction); and program design factors that promote medical students' sense of belonging (mentoring systems, extra-curricular activities). Lastly, how the learning environment could be adjusted to promote medical students' sense of belonging, engagement, and collegiality, such as teamwork and collaboration between medical students and nurses, might not be clearly stated. This chapter answered the RQ6 on how faculty members increased medical students' sense of belonging, engagement, and collegiality in relation to burnout. The identified strategies can be used in the future development of faculty development programs to create more awareness among teachers. Residents also play a key role in promoting medical students' sense of belonging, engagement, and collegiality, and the future resident-as-teacher program might include these. Some strategies, such as mentoring systems and social time, were related to program design.

Chapter seven

We answer our research questions in **Chapter 7** by synthesizing and discussing our findings from all studies. This body of work and this dissertation provide insight about the prevalence of burnout in medical schools and related factors among both postgraduate and undergraduate students, and how to promote a sense of belonging, engagement, and collegiality (as a proposed intervention to alleviate burnout). We started by exploring the magnitude of the burnout problems by determining the prevalence of burnout among postgraduate medical students in the pediatric department (**Chapter 2**) and undergraduate medical students (**Chapter 3**). Then, we explored the potentially negative impact, such as depression risk, and its related factors, including a sense of belonging and engagement. The relationships between burnout, learning environment, and work-related quality of life among pediatric residents were confirmed in **Chapter 2**. After we explored the prevalence of burnout in medical school and found evidence of a burnout problem among undergraduate medical students We chose to investigate further after reading that novel or alternative interventions that foster a sense of belonging (both valued and fit) and collegiality have been proposed as novel ways to overcome the disconnect between peers and other professionals in the clinical workplace, potentially increasing work engagement and lowering the incidence of burnout. We decided to explore to what extent burnout is related to a sense of belonging (relatedness with others) and work engagement for undergraduate medical students (**Chapter 4**). After we confirmed the association between burnout, a sense of belonging (relatedness with others), and work engagement, we studied the strategy to promote collegiality, engagement, and a sense of belonging from both undergraduate medical students' and faculty members' perspectives. Students reported key features that could be used to promote collegiality and the sense of belonging and engagement: relevant tasks and learning activities; safety in the learning environment; peer interaction; certain program design factors; and the dynamics of collegiality while progressing through medical school, as well as personal stances and social skills. These strategies could potentially be the cause and solution of the burnout problem.

From postgraduate and undergraduate medical students' perspectives, an unsafe learning environment and mistreatment were evidenced in medical school and had a negative effect on promoting collegiality and the sense of belonging and engagement. The finding revealed mistreatment among undergraduate medical students is a serious problem worldwide, including in Thailand. The prevalence of mistreatment was high, with workplace learning-related bullying being the most common category. Attending staff was the most common source of mistreatment. Mistreatment was associated with several negative consequences, including burnout, depression risk, and unprofessionalism. However, the reporting of mistreatment by medical students was low.

From the point of view of faculty members, the most important things to help medical students feel a sense of belonging, engagement, and collegiality in relation to burnout were: creating safe learning environments (mutual respect and a non-judging learning

environment); promoting teacher-student or student-student relationships by faculty members (promote relationships in the workplace; make students feel valuable; encourage socialization; stimulate student-student/resident interaction); and creating a sense of community among medical students.

In conclusion, this body of work and this dissertation provide insight into the magnitude of the burnout problem in medical school, evidence of the relationship between burnout and the new proposed intervention, how to promote collegiality, engagement, and a sense of belonging, and identify unsafe learning environments, mistreatment problems, and related consequences.

Samenvatting

Hoofdstuk een

Dit proefschrift begint met het aan de orde stellen van de burn-outproblematiek in het Geneeskundeonderwijs, in zowel de opleiding tot basisarts als de vervolgopleiding tot medisch specialist, op basis van de literatuur. Burn-out is een syndroom dat verband houdt met iemands werk en beslaat de volgende drie deelgebieden: grote emotionele uitputting, hoge depersonalisatie en geringe persoonlijke bekwaamheid. Het is een wereldwijd en cultuuronafhankelijk probleem dat in westerse landen uitgebreid is onderzocht. Het proefschrift onderzocht de omvang van deze burn-outproblematiek en de daarmee samenhangende factoren onder artsen in opleiding tot specialist (aios; **Hoofdstuk 2**) en geneeskundestudenten (**Hoofdstuk 3**). Omdat er in het Thais geen instrument voorhanden was waarmee geneeskundestudenten op burn-out konden worden gescreend, hebben we in **Hoofdstuk 3** ook de psychometrische eigenschappen van een bestaand instrument onderzocht. In **Hoofdstuk 1** bleek dat in de literatuur een interventie wordt aanbevolen om burn-out te verminderen, welke bestond uit het bevorderen van het gevoel “erbij te horen” (verbondenheid met anderen), van collegialiteit en betrokkenheid. Het doel van **Hoofdstuk 4** was dan ook om: 1) de verbanden tussen burn-out, het gevoel erbij te horen en de betrokkenheid bij het werk te onderzoeken; en 2) vast te stellen op welke manieren collegialiteit, betrokkenheid en het gevoel erbij te horen kunnen worden bevorderd binnen de opleiding tot basisarts. De resultaten van **Hoofdstuk 2 en 4** gaven aan dat er sprake was van een onveilig leerklimaat onder en slechte behandeling van geneeskundestudenten. Daarom werd in **Hoofdstuk 5** onderzocht in welke mate studenten slecht werden behandeld binnen het leerklimaat van de geneeskundeopleiding. Uit **Hoofdstuk 2 en 4** kwam naar voren dat stafleden een cruciale rol speelden in de burn-outproblematiek, daar zij het gevoel erbij te horen, collegialiteit en betrokkenheid konden helpen bevorderen. In **Hoofdstuk 6** dachten stafleden mee over hoe zij het gevoel erbij te horen, collegialiteit en betrokkenheid konden helpen bevorderen teneinde burn-out te verminderen.

Hoofdstuk twee

We onderzochten in welke mate er onder niet-westerse aiossen Kindergeneeskunde sprake was van burn-outproblemen en beantwoordden de vraag: In hoeverre ervaren aiossen kindergeneeskunde in een niet-westerse setting burn-out? En wat is het verband tussen burn-out en persoonlijke kenmerken van het leerklimaat van aiossen en hun werkgerelateerde kwaliteit van leven, alsmede de factoren die burn-out onder aiossen tegengaan en bevorderen? Het onderzoek werd in twee fasen uitgevoerd.

De eerste fase bestond uit een vragenlijstonderzoek op basis van de gevalideerde *Maslach Burnout Inventory*-vragenlijst (de MBI-HS), de *Postgraduate Hospital Educational Environment Measure* (PHEEM), en de *Work-Related Quality of Life*-schaal. Eenenvertig Thaise assistenten in opleiding tot kinderarts namen deel aan het

onderzoek en geen van hen scoorde hoog op alle drie de burn-outvlakken samen. Zeventien procent scoorde hoog op twee van de drie vlakken. In dit hoofdstuk werd vastgesteld dat emotionele uitputting en het leerklimaat beiden verband hielden met werkgerelateerde kwaliteit van leven.

In de tweede fase werden de assistenten in opleiding tot kinderarts die hoog hadden gescoord op de burn-outvragenlijsten individueel geïnterviewd. De participanten reflecteerden op de voornaamste redenen die tot hun burn-out hadden geleid, zoals **Oneigenlijke** taken, docenten en onderwijsstijlen; hun beleving van onzekerheid ten aanzien van kennis en hoe dit hun functioneren beïnvloedde; tijdsdimensies; negatieve levensgebeurtenissen tijdens de opleiding; rolverwachtingen en werkverdeling; duidelijkheid; en faciliteiten. De volgende strategieën werden in **Hoofdstuk 2** voorgesteld om burn-out te verminderen: beperk onnodige werkdruk tot een minimum; maak vooraf een tijdsplanning zodat overuren worden voorkomen; maak duidelijk wat de rolverwachtingen zijn; en zorg voor een veilige leeromgeving. Er werd geconstateerd dat er inderdaad sprake was van slechte behandeling van de kinderartsen in opleiding en aanbevolen om dit probleem nader te onderzoeken.

Hoofdstuk drie

Aangezien er in het Thais geen gevalideerd instrument voorhanden was waarmee studenten op burn-out konden worden gescreend, was het wenselijk dat er een Thaise versie van de MBI-SS met toereikende psychometrische eigenschappen ter beschikking kwam. Deze zou namelijk garanderen dat we burn-out onder Geneeskundestudenten nauwkeurig konden meten en daarmee ons begrip van burn-out onder deze populatie in niet-westerse landen vergroten. In **Hoofdstuk 3** werd een Thaise versie van de *Maslach Burnout Inventory-Student Survey* (MBI-SS) ontwikkeld en vervolgens getest op haar psychometrische eigenschappen. Het doel van dit hoofdstuk was om onderzoeksvraag (OV) 2 te beantwoorden: Wat zijn de psychometrische eigenschappen van de Thaise versie van de MBI-SS en is het vóórkomen van burn-out en zijn deelgebieden mogelijk gecorreleerd met depressie, aantal jaar in opleiding, geslacht, en cijfergemiddelde onder Thaise geneeskundestudenten? Deze Thaise versie van de MBI-SS vertoonde goede eigenschappen bij gebruik onder Thaise geneeskundestudenten en kan derhalve gebruikt worden om burn-out te meten. Vervolgens lieten we de studenten een zelfrapportage invullen om de prevalentie van burn-out en de daarmee samenhangende factoren te onderzoeken. Achtentwintig procent van de geneeskundestudenten had last van een burn-out. Om het risico op depressie en het verband met burn-out vast te stellen, maakten we gebruik van een vragenlijst over depressie, de zogeheten PHQ-9. De prevalentie van burn-out (zoals gemeten aan de hand van de drie deelgebieden 'grote emotionele uitputting', 'hoge depersonalisatie' en 'geringe persoonlijke bekwaamheid') bedroeg 28%. Deze studie maakt aannemelijk dat studenten van het mannelijke geslacht met verminderde studieprestaties een groter risico liepen op het krijgen van een burn-out. Voorts werden in dit hoofdstuk aanwijzingen gevonden dat er een verband bestaat

tussen burn-out en depressie. Om echter meer inzicht te verschaffen en om de overname van mogelijke oplossingen voor het verminderen van deze onderling samenhangende problemen te vergemakkelijken, is er meer onderzoek nodig naar andere relevante factoren die bijdragen aan burn-out en het risico op depressie in een niet-westerse context.

Hoofdstuk vier

In de literatuur werd een nieuwe interventie voorgesteld om burn-out tegen te gaan, namelijk het creëren van het gevoel erbij te horen, van collegialiteit en van betrokkenheid. Er is echter weinig bewijs dat er ook in een niet-westerse context een verband bestaat tussen burn-out en de nieuwe voorgestelde methodes. Dit hoofdstuk beoogt de volgende twee onderzoeksvragen (OV 3 en 4) te beantwoorden: In hoeverre heeft burn-out onder geneeskundestudenten te maken met hun gevoel erbij te horen (verbondenheid met anderen) en met hun betrokkenheid bij het werk? (OV4). Wat zijn volgens Geneeskundestudenten de voornaamste factoren die zowel positief als negatief bijdragen aan collegialiteit, betrokkenheid en het gevoel erbij te horen? Aan de hand van een exploratieve sequentiële multimethodische onderzoeksopzet met vragenlijsten en semigestructureerde individuele interviews hebben we zowel kwantitatieve als kwalitatieve gegevens verzameld onder Geneeskundestudenten aan de Mahidol universiteit, Thailand. Hierbij maakten we gebruik van de MBI-SS-vragenlijst voor het meten van burn-out. De *Basic Psychological Need Satisfaction at Work Scale* (BPNSS-21) en de Utrechtse bevlogenheidschaal, de versie voor studenten (*Utrecht Work Engagement Scale - Student Version*; UWESS-9), maten respectievelijk de bevrediging van psychologische basisbehoeften op het werk bij studenten en hun betrokkenheid bij het werk. De Thaise versies van deze BPNSS-21 en UWESS-9 lieten zien dat zij voldoende geschikt waren voor toepassing in de Thaise culturele context. Het gevoel erbij te horen, betrokkenheid en collegialiteit hielden ook in de Thaise context verband met burn-out. Er bestond een significant, doch zwak negatief verband tussen burn-out enerzijds en betrokkenheid ($r = 0,39$, $p 0,005$) en de bevrediging van psychologische basisbehoeften ($r = 0,37$, $p 0,005$) anderzijds. Eenzelfde verband werd geconstateerd tussen het gevoel erbij te horen en burn-out ($r = 0,25$, $p 0,005$). Twintig Geneeskundestudenten namen deel aan het kwalitatieve onderzoek. De voornaamste kenmerken voor het bevorderen van collegialiteit, het gevoel erbij te horen en betrokkenheid waren relevante taken en leeractiviteiten; veiligheid in de leeromgeving; interactie met medestudenten; factoren gerelateerd aan de onderwijsopzet; de dynamiek van collegialiteit in de loop van de geneeskundeopleiding; en persoonlijke opstelling en sociale vaardigheden. Dit hoofdstuk beantwoordt OV 3, 4 en 5 en levert twee gevalideerde instrumenten op, te weten de Thaise versies van de BPNSS-21 en UWESS-9, waarmee respectievelijk de bevrediging van psychologische basisbehoeften op het werk bij studenten en hun betrokkenheid bij het werk kunnen worden gemeten.

Hoofdstuk vijf

De bevindingen met betrekking tot onderzoeksvragen 1 en 4 gaven aan dat de psychologische veiligheid van de leeromgeving en een slechte behandeling cruciale factoren waren voor het gevoel erbij te horen, betrokkenheid en collegialiteit onder geneeskundestudenten. De onderzoeksvraag in **Hoofdstuk 5** werd dan ook gesteld om de omvang en aard van burn-out en slechte behandeling te onderzoeken, alsmede de eigenschappen en het daarmee gepaard gaande gedrag van studenten die slecht werden behandeld. Zodoende luidde OV 5: Wat zijn de relaties tussen burn-out en een slechte behandeling, waaronder onder meer de prevalentie, herhaling, vormen, meldingsacties, slecht behandelde personen, gerelateerd gedrag en welzijn van geneeskundestudenten in niet-westerse Aziatische contexten worden verstaan? Bij slechte behandeling wordt gedrag vertoont dat getuigt van gebrek aan respect voor de waardigheid van anderen, welke opzettelijk of onopzettelijk kan zijn en iemands leerproces of gevoel van welbevinden kan verstoren. Eerst ontwikkelden we een Thaise versie van de *Clinical Workplace Learning Negative Acts Questionnaire-Revised* (NAQ-R) vragenlijst met behulp van een heen- en terugvertaalproces met kwaliteitsanalyse. De opzet van het onderzoek bestond uit een cross-sectionele vragenlijststudie. De vragenlijst omvatte de Thaise versies van de *Clinical Workplace Learning* NAQ-R, MBI-SS en de *Patient Health Questionnaire* (om het risico op depressie te meten), alsook demografische informatie, kenmerken van slechte behandeling, meldingen hiervan, gerelateerde factoren en gevolgen. In totaal vulden 681 geneeskundestudenten (52,4% vrouw, 54,6% in de klinische jaren) de vragenlijst in (een respons van 79,1%). De Thaise *Clinical Workplace Learning* NAQ-R werd voldoende geschikt bevonden voor gebruik onder Thaise geneeskundestudenten. De meeste participanten (n = 510, 74,5%) waren slecht behandeld. Dit gebeurde vooral in de vorm van pesten tijdens het werkplekleren (67,7%) en hoofdzakelijk door de aanwezige stafleden of docenten (31,6%). Het meldgedrag van studenten was echter gering: slechts 56 studenten (8,2%) meldden dergelijke voorvallen aan anderen. Het academisch jaar was een belangrijke factor die samenhang met pesten tijdens het werkplekleren. Er bestond een significant verband tussen het risico op depressie en burn-out enerzijds en individueel pesten anderzijds. Studenten die individueel waren gepest, kregen vaker een aantekening van onprofessioneel gedrag in hun dossier, zoals het hebben van een conflict of woordenwisseling met collega's, niet bij de les of op het werk aanwezig zijn zonder gegronde reden en het slecht behandelen van anderen. In dit hoofdstuk werd OV 5 beantwoord met de constatering dat er duidelijk sprake was van slechte behandeling van Geneeskundestudenten tijdens de opleiding en dat dit verband hield met het risico op depressie, burn-out en onprofessioneel gedrag. Dit hoofdstuk voorziet ook in een Thaise gevalideerde versie van de *Clinical Workplace Learning Negative Acts Questionnaire-Revised* (NAQ-R) waarmee verder gemeten kan worden in hoeverre studenten in de Thaise geneeskundeopleiding slecht worden behandeld.

Hoofdstuk zes

Stafleden maken een wezenlijk onderdeel uit van de leeromgeving en de onderwijsopzet, en als zodanig versterken zij het gevoel erbij te horen, de betrokkenheid en collegialiteit. Desondanks is er weinig onderzoek gedaan naar wat zij zien als mogelijke strategieën voor het versterken van deze elementen. **Hoofdstuk 6** beoogt OV 6 te beantwoorden, welke luidt: Wat zijn volgens stafleden de belangrijkste zaken die van invloed zijn (zowel in positieve als negatieve zin) op het gevoel dat een Geneeskundestudent heeft erbij te horen, diens betrokkenheid en collegialiteit? Aan de hand van een kwalitatief-onderzoeksopzet onderzochten we wat in de ogen van stafleden het gevoel erbij te horen, betrokkenheid en collegialiteit onder geneeskundestudenten bevorderde of juist belemmerde. Twintig fulltime stafleden namen deel aan de interviews. Zij gaven als volgt aan hoe zij dachten dat stafleden konden bijdragen aan de bevordering van voornoemde elementen: het creëren van een veilige leeromgeving (waarin wederzijds respect wordt getoond en er niet over elkaar wordt geoordeeld); het bevorderen van docent-student- of student-student-relaties door stafleden (door relaties op de werkplek te promoten; studenten gewaardeerd te laten voelen; het onderlinge contact te bevorderen; interacties tussen studenten en aiossen te stimuleren); en onderwijsgerelateerde factoren die geneeskundestudenten het gevoel geven dat ze erbij horen (mentorsystemen, extracurriculaire activiteiten). Tot slot werd aangegeven hoe de leeromgeving zou kunnen worden aangepast ter bevordering van het gevoel erbij te horen, van betrokkenheid en van collegialiteit onder geneeskundestudenten, zoals teamwerk en samenwerking tussen deze studenten en verpleegkundigen. In dit hoofdstuk werd antwoord gegeven op OV 6, namelijk hoe stafleden het gevoel erbij te horen, betrokkenheid en collegialiteit onder geneeskundestudenten in relatie tot burn-out versterkten. De in kaart gebrachte strategieën kunnen worden gebruikt bij de toekomstige ontwikkeling van docentprofessionaliseringsprogramma's om meer bewustzijn onder docenten te creëren. Evenzo spelen aiossen een centrale rol bij het bevorderen van het gevoel erbij te horen, betrokkenheid en collegialiteit onder geneeskundestudenten en het toekomstige aios-als-opleider-programma zou hierop kunnen inspelen. Andere strategieën, zoals mentorsystemen en tijd voor sociaal contact, hadden te maken met de opzet van het onderwijs.

Hoofdstuk zeven

In **Hoofdstuk 7** beantwoorden we onze onderzoeksvragen door onze bevindingen uit alle onderzoeken te bundelen en te bespreken. Dit oeuvre en dit proefschrift verschaffen inzicht in de prevalentie van burn-out in de geneeskundeopleiding en de daarmee samenhangende factoren onder zowel Geneeskundestudenten als aiossen, alsmede in hoe het gevoel erbij te horen, betrokkenheid en collegialiteit kan worden bevorderd (als voorgestelde interventie om burn-out tegen te gaan). Eerst hebben we de omvang van de burn-outproblematiek onderzocht, door vast te stellen wat de prevalentie is van

burn-out onder aiossen op de afdeling kindergeneeskunde (**Hoofdstuk 2**) en onder geneeskundestudenten (**Hoofdstuk 3**). Vervolgens onderzochten we de mogelijk negatieve gevolgen, zoals het risico op depressie en de daarmee samenhangende factoren, waaronder het gevoel erbij te horen en betrokkenheid. In **Hoofdstuk 2** werd bevestigd dat er een verband bestond tussen burn-out, de leeromgeving en werkgerelateerde kwaliteit van leven onder aiossen Kindergeneeskunde. Hierna hebben we de prevalentie van burn-out in de geneeskundeopleiding onderzocht en vonden we aanwijzingen voor het bestaan van een burn-outprobleem onder geneeskundestudenten. We besloten om nader onderzoek te verrichten, nadat we hadden gelezen dat er nieuwe of alternatieve interventies werden voorgesteld ter bevordering van het gevoel erbij te horen (zich zowel gewaardeerd als voldoende bekwaam voelen) alsook de collegialiteit met het uiteindelijke doel de kloof tussen medestudenten en andere professionals op de klinische werkplek te dichten, waardoor mogelijk hun betrokkenheid bij het werk wordt vergroot en de kans op een burn-out verkleind. Meer specifiek besloten we te onderzoeken in hoeverre burn-out onder geneeskundestudenten verband hield met hun gevoel erbij te horen (verbondenheid met anderen) en met hun betrokkenheid bij het werk (**Hoofdstuk 4**). Na te hebben bevestigd dat er inderdaad een verband bestond tussen burn-out, het gevoel erbij te horen (verbondenheid met anderen) en betrokkenheid bij het werk, onderzochten we wat volgens geneeskundestudenten en stafleden de beste strategie was om collegialiteit, betrokkenheid en het gevoel erbij te horen te bevorderen. Studenten beschreven een aantal belangrijke kenmerken die collegialiteit en het gevoel erbij te horen en betrokkenheid zouden kunnen bevorderen, namelijk: relevante taken en leeractiviteiten; veiligheid in de leeromgeving; interactie met medestudenten; bepaalde onderwijsgerelateerde factoren; en de dynamiek van collegialiteit in de loop van de geneeskundeopleiding, alsmede persoonlijke opstelling en sociale vaardigheden. Deze strategieën zijn mogelijk de oorzaak en de oplossing van het burn-outprobleem.

Geneeskundestudenten en aiossen gaven aan dat er in de opleiding sprake was van een onveilige leeromgeving en slechte behandeling en dat dit een negatief effect had op de bevordering van collegialiteit en het gevoel erbij te horen en betrokkenheid. Deze bevinding toonde aan dat de slechte behandeling van geneeskundestudenten wereldwijd een ernstig probleem is, ook in Thailand. Het kwam vaak voor dat studenten slecht werden behandeld en dit gebeurde vooral in de vorm van pesten tijdens het werkplekleren. In de meeste gevallen waren de aanwezige stafleden hiervoor verantwoordelijk. Deze slechte behandeling had diverse negatieve consequenties tot gevolg, waaronder burn-out, het risico op depressie en onprofessioneel gedrag. Desondanks deden geneeskundestudenten slechts weinig melding van dergelijke voorvallen.

Wat de stafleden daarentegen betrof, was het voornaamste dat men kon doen om geneeskundestudenten te helpen zich erbij te voelen horen, meer betrokken te zijn en

collegialiteit te ervaren in relatie tot burn-out als volgt: het creëren van een veilige leeromgeving (waarin wederzijds respect wordt getoond en er niet over elkaar wordt geoordeeld); het bevorderen van docent-student- of student-student-relaties door stafleden (door relaties op de werkplek te promoten; studenten gewaardeerd te laten voelen; het onderlinge contact te bevorderen; interacties tussen studenten onderling en tussen studenten en docenten te stimuleren); en het creëren van een gemeenschapsgevoel onder geneeskundestudenten.

Samenvattend kunnen we stellen dat dit proefschrift inzicht verschaft in de omvang van de burn-outproblematiek in de geneeskundeopleiding, bewijs levert voor het verband tussen burn-out en nieuwe voorgestelde interventies en tips aanreikt voor het bevorderen van collegialiteit, betrokkenheid en het gevoel erbij te horen, alsmede voor het herkennen van onveilige leeromgevingen, slechte behandeling van studenten en de gevolgen die daarmee samenhangen.

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Brief Curriculum Vitae of the author



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Assistant Prof. Puranitee received a diploma from the Board of Pediatrics and the Sub-board of Pediatric Allergy and Immunology. She has been a lecturer and mentor in pediatrics to undergraduate, postgraduate, and nurse students, and a lecturer in the Master of Health Science Education program. She graduated with her Master of Health Professions Education, and she started her PhD program in the School of Health Professions Education at Maastricht University, the Netherlands. In 2021, she achieved the status of Senior Fellow of Advance Higher Education (SFHEA), United Kingdom. In 2022, she was a representative of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University to receive the ASPIRE to Excellent for Student Engagement Award from the AMEE ASPIRE Academy. Assist. Prof. Puranitee is a member of the Medical Education Research and Academic Center, Consortium of Thai Medical Schools (MERAC-COTMES). She has contributed to the faculty development program regarding medical education and continues to be involved in curriculum development, assessment reform, and a newly developed mentoring program at her institution.

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Related to

Puranitee P., Benjaponpitak S., Kamchaisatian W., Vilaiyuk S., Manuyakorn W, Pattanaprateep O. Direct medical costs of Management of Thai Pediatric asthma: Pilot study Asian Pac J Allergy Immunol. 2015 Dec;33(4):296-300. doi: 10.12932/AP0494.33.4.2015.

Puranitee P., Siwarom S, Plitponkarnpim A, Manuyakorn W, Sinitkul R, Arj-Ong Vallipakorn S. Association of indoor air quality and preschool children's respiratory symptoms. Asian Pac J Allergy Immunol. 2016 Dec 12. doi: 10.12932/AP0838.

Puranitee P, Rerkpattanapipat T, Kamchaisatian W, Vilaiyuk S, Manuyakorn W, Vallibhakara S, Benjaponpitak S. Basophil Activation Test in Immediate-Type Hypersensitivity Reactions to Betalactams Using CD63 and CCR3 in Thailand. J Med Assoc Thai 2018;101:40-7.

Plitponkarnpim A, Srikaew C, **Puranitee P**, Vallibhakara S. ICT Exposure in Children Younger Than 2 Years: Rates, Associated Factors, and Health Outcomes. J Med Assoc Thai 2018;101:345-9.

Puranitee P, Stevens FFCJ, Pakakasama S, Plitponkarnpim A, Vallibhakara SA, Busari JO, Heeneman S, van Mook WNKA. Exploring burnout and the association with the educational climate in pediatric residents in Thailand. BMC Med Educ. 2019 Jul 5;19(1):245. doi: 10.1186/s12909-019-1687-7. Erratum in: BMC Med Educ. 2019 Aug 1;19(1):296. PMID: 31277615; PMCID: PMC6612205. [Thesis paper]

Puranitee P, Saetang S, Sumrithe S, Busari JO, van Mook WNKA, Heeneman S. Exploring burnout and depression of Thai medical students: the psychometric properties of the Maslach Burnout Inventory. Int J Med Educ. 2019 Nov 29;10:223-229. doi: 10.5116/ijme.5dc6.8228. PMID: 31786565; PMCID: PMC7252444. [Thesis paper]

Puranitee P, Fuangfu S, Dumrongwongsiri O. Determination of Hemoglobin Level Among 9-Month-Old Infants Visiting Well Child Clinic. Glob Pediatr Health. 2021 Jul

30;8:2333794X211036629. doi: 10.1177/2333794X211036629. PMID: 34377746; PMCID: PMC8326615.

Puranitee P, Kaewpila W, Heeneman S, van Mook WNKA, Busari JO. Promoting a sense of belonging, engagement, and collegiality to reduce burnout: a mixed methods study among undergraduate medical students in a non-Western, Asian context. *BMC Med Educ*. 2022 Apr 28;22(1):327. [Thesis paper]

Chucherd O, Vallibhakara SA, Paiwattananupant K, **Puranitee P**, Wattanayingcharoenchai R, Vallibhakara O. The effect of online video-assisted teaching program on medical students learning procedure of fractional curettage. *BMC Med Educ*. 2023 Feb 2;23(1):82. doi: 10.1186/s12909-023-04052-3. PMID: 36732732; PMCID: PMC9893180.

Tungsupreechameth A, Tanpowpong P, **Puranitee P**. Mistreatment in paediatric residency programs in Thailand: a national survey. *Med Educ Online*. 2023 Dec;28(1):2220176. doi: 10.1080/10872981.2023.2220176. PMID: 37270793; PMCID: PMC10240967.

Naothavorn W, **Puranitee P**, Kaewpila W, Sumrithe S, Heeneman S, van Mook WNKA, Busari JO. An exploratory university-based cross-sectional study of the prevalence and reporting of mistreatment and student-related factors among Thai medical students. *BMC Med Educ*. 2023 Jun 26;23(1):473. doi: 10.1186/s12909-023-04462-3. PMID: 37365553; PMCID: PMC10291765.

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