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Original Article

Empathy Levels and Burnout in Medical Students: An Analytic Cross-Sectional Study in a Thai University Hospital

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ABSTRACT

Objective: In medical education, empathy is an essential element of professionalism; however, medical students are sometimes advised to limit empathy. Excessive empathy might be linked to burnout and trigger negative consequences such as low mood and quality of life. Due to limited data regarding the association between empathy and burnout, this study aimed to examine the relationship between levels of empathy and burnout with their respective subscales, among medical students.

Material and Methods: This cross-sectional study was conducted at the clinical level of medical students currently undergoing medical training at the Faculty of Medicine, Prince of Songkla University, at the end of the 2020 academic year. Medical students aged more than 20 years who completed the questionnaires were included. The questionnaires comprised 1) demographic data, 2) The Toronto Empathy Questionnaire, 3) The Maslach Burnout Inventory (Thai version), and 4) The Thai Mental Health Indicator-15. Associations between empathy and burnout including emotional exhaustion, depersonalisation, and personal accomplishment subscales were investigated using linear regression analysis.

Results: From the three-year clinical level, 91.9% (466 of 507) of medical students completed the questionnaires, with a mean age of 23.1±1.4 years. In the linear regression analyses, empathy scores were positively associated with emotional exhaustion and negatively associated with depersonalisation and low personal accomplishment (Adjusted coefficient 0.18 (0.02, 0.33), −0.09 (−0.18, −0.01), and −0.42 (−0.52, −0.31), respectively). Among the empathy subscales, altruism was significantly correlated with personal accomplishment (r=−0.41, p-value<0.001).

Conclusion: The study revealed a negative correlation between empathy and overall burnout. While a high level of empathy was found to prevent depersonalisation and enhance personal accomplishment, it did not significantly hinder the emotional exhaustion associated with burnout. Empathy, particularly altruism, was related to personal accomplishments. Our findings suggest that empathy is a crucial determinant of burnout prevention; therefore, optimal levels of empathy

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should be taught to medical students during medical training to prevent emotional exhaustion. However, the evaluation of further causal explanations is recommended.

Keywords: burnout; empathy; medical education; medical student

INTRODUCTION

Empathy is the ability to be aware of or feel what another person is experiencing from within their frame of reference[1,2]. It consists of emotional affiliation, emotional disconnection, and cognitive empathy[3]. Furthermore, empathy is an emotional experience between an observer and a subject in which the observer, based on visual and auditory cues, identifies and transiently experiences the subject's emotional state[4]. To be comprehended as empathetic, the observer must communicate this understanding to the subject. During the initial phase of the process, the observer must identify and understand the basis of the subject's feelings[5].

The goal of medicine is not only to treat patients' diseases but also to relieve their suffering and cure them as humans. Therefore, empathy is key to professionalism in medical education and is a necessary skill[4]. However, limiting empathy is sometimes advised among medical students because overwhelming empathy may be linked to burnout, leading to negative impacts, such as low mood or low quality of life[6]. Medical students face many challenges during training that may be associated with the risk of burnout, including the learning environment[7]. Medical students' stress[7,8] may be associated with reduced compassion, empathy, and humanitarian attitudes during medical training[9–11]. This is because distress, including burnout, anxiety, depression, and lack of personal well-being, is also recognized as an essential influence on practice habits or lower levels of empathy among medical students[6,12–15].

However, data concerning the correlation between empathy and burnout have been limited. In Thailand, a 2012 study identified empathy scores among medical students. However, this study did not find any association between empathy levels and interest factors, including experiences of burnout, and mental health[16]. Due to the limited evidence for a comprehensive investigation of empathy and burnout, this study aimed to examine the correlation between levels of empathy and burnout with their subscales among medical students. We also hypothesized that empathy levels would be associated with burnout among medical students.

MATERIAL AND METHODS

This cross-sectional study was conducted among medical students currently undergoing medical training at the clinical level (fourth to sixth years) in 2020. All 507 medical students (173, 180, and 154 from the fourth-, fifth-, and sixth-year levels, respectively) were invited to collaborate in this study. The research assistant approached all the medical students in class and handed them an information sheet, which described the rationale for the study, and the allotted time to complete the survey. They had at least 10–15 minutes to consider whether to join the study or not. If they wished to participate, the research assistant distributed the questionnaires. The inclusion criteria were medical students aged more than 20 years and who finished the questionnaires.

Measurements

1. Participants' characteristics consisted of age, sex, cumulative Grade Point Average [GPA], history of physical and psychiatric illness, alcohol consumption, and substance use, and experienced stress within a year, defined by the participants' report of their encounter with any stressful

events in the past year in any domains of life including studying, learning environment, relationship with friends, relationship with family, financial and health issue.

2. The Thai version of the Toronto Empathy Questionnaire (TEQ) was used to evaluate empathy. Empathy was divided into six subscales: perception of an emotional state in another that stimulates the same emotion in oneself, assessment of emotion comprehension in others, assessment of emotional states in others by indexing the frequency of behaviors demonstrating appropriate sensitivity, sympathetic physiological arousal, altruism, and behaviors engaging in higher-order empathic responses, such as prosocial helping behavior. This consisted of 16 questions with a 5-point Likert scale for each question. Responses were scored on the following scale for positively worded items: 0 (never), 1 (rarely), 2 (sometimes), 3 (often), and 4 (always). The same scale was used to reverse negatively worded items. The summed scores for all 16 questions ranged from 0 to 64. Higher scores represented higher levels of self-reported empathy. The Cronbach's alpha coefficient for this tool was 0.85[6,17]. The TEQ demonstrated internal consistency with a Cronbach's alpha coefficient of 0.77 for the data in this study.

3. The Thai version of the Maslach Burnout Inventory (MBI) questionnaire was used to evaluate burnout. It consisted of 22 items divided into three dimensions: emotional exhaustion (feelings of being emotionally overextended and exhausted by one's work), depersonalisation (unsympathetic and impersonal responses toward the recipients of one's care or service), and personal accomplishment (feelings of competence and achievement in one's work)[18]. For the emotional exhaustion and depersonalisation subscales, higher scores correspond to higher degrees of burnout (emotional exhaustion score: 0-16=low, 17-26=moderate, and >26=high; depersonalisation score: 0-6=low, 7-12=moderate, and >12=high). Lower personal accomplishment scores corresponded to higher degrees of burnout (personal accomplishment score: >38=low, 32-38=moderate, 0-31=high). The Cronbach's alpha coefficient of each domain in the Thai version of the MBI ranged from 0.65-0.92[18,19]. The MBI questionnaire demonstrated internal consistency with a Cronbach's alpha coefficient of 0.84 for the data in this study.

4. The Thai Mental Health Indicator-15 (TMHI-15) questionnaire consisted of 15 questions. The score for each question ranged from 1 to 4, and the total score was between 15 to 60. The interpretation of the total score was that higher scores indicated better mental health. This tool had a Cronbach's alpha coefficient of 0.7[20]. The TMHI-15 questionnaire demonstrated internal consistency with a Cronbach's alpha coefficient of 0.82 for the data in this study.

Statistical analyses

Descriptive statistics such as proportions, means, standard deviation (S.D.), median, and interquartile range (IQR) were calculated. Linear regression analyses were used to identify associations between burnout levels, levels of empathy, and mental health. We included a history of physical and psychiatric illness, alcohol consumption, substance abuse, and stress experienced within a year in the regression models. Burnout subscales such as emotional exhaustion, depersonalisation, and personal accomplishment were also analysed. To examine more facets of empathy concerning burnout, Spearman's correlation analyses were performed (due to non-normal distribution). Analyses were conducted using R version 3.4.1 (R Foundation for Statistical Computing). Statistical significance was defined as a p-value of less than 0.05.

RESULTS

Of the 507 medical students, only 466 completed the questionnaire (152, 160, and 154 from the fourth, fifth, and sixth years, respectively). The response rate was 91.9%. The mean age was 23.1±1.4 years, and the accumulative GPA was 3.2±0.3.

As shown in Table 1, one-third of the participants reported a history of alcohol consumption, and approximately 8.8% and 14.8% of them presented with physical and psychiatric illnesses, respectively. The number of participants who experienced stressors in the past year was high (95.3%). The mean score in terms of the levels of empathy was 44.0, which was below the average level (below 45). There was a downward trend of empathy levels with increasing clinical years (mean=44.38, 43.26, 42.66 in the fourth-, fifth-, and sixth-year medical students, respectively; p-value=0.041). Using the Thai version of the MBI questionnaire comprised three domains, the median score of burnout showed high emotional exhaustion (median=31.0; 22.0-40.0), moderate depersonalisation (median=10.0; 5.0-15.0), and high personal accomplishment (median=12.0; 8.0-17.7). The median score of mental health status defined by TMHI-15 was 46.0; 42.2-50.0 which reflected that our medical students in clinical years had fair mental health (score between 44-50).

Based on the study hypothesis, 'Do levels of empathy relate to burnout?' from the linear regression analyses, the empathy score was positively associated with the emotional exhaustion score, and negatively associated with depersonalisation and low personal accomplishment (Adjusted coefficient 0.18 (0.02, 0.33), -0.09 (-0.18, -0.01), and -0.42 (-0.52, -0.31), respectively) (Table 2). Thus, a higher level of empathy could increase emotional exhaustion, but decrease depersonalisation, and increase personal accomplishment.

Mental health and empathy scores and their subscales were significantly and negatively correlated with burnout. Among the empathy subscales, altruism was significantly correlated with low personal accomplishment subscale (r=-0.41, p-value<0.001). The assessment of emotional states in others was significantly correlated with depersonalization subscale (r=-0.26, p-value<0.001). In addition, the perception of an emotional state in another was significant correlated with emotional exhaustion (r=-0.14, p-value<0.01) (Table 3).

Table 1 Participants' characteristic with mental health, burnout and empathy score (n=466)

Variables	N (%)
Gender	
Male	202 (43.3)
Female	262 (56.2)
Missing data	2 (0.4)
Year of education	
4th year	152 (32.6)
5th year	160 (34.3)
6th year	154 (33.0)
Presence of physical illness	69 (14.8)
Presence of psychiatric illness	41 (8.8)
Presence of alcohol consumption	153 (32.8)
Presence of substance use	3 (0.6)
Presence of stressors within a year	444 (95.3)
Mental health score (median; IQR)	46.0; 42.2-50.0
Burnout (median; IQR)	
Emotional exhaustion	31.0; 22.0-40.0
Depersonalization	10.0; 5.0-15.0
Low personal accomplishment	12.0; 8.0-17.7
Empathy score (median; IQR)	
Perception of an emotional state in another that stimulates the same emotion in oneself	2.5; 2.0-3.0
Assessment of emotion comprehension in others	3.0; 2.0-3.0
Assessment of emotional states in others by indexing the frequency of behaviors demonstrating appropriate sensitivity	2.6; 2.4-3.0
Sympathetic physiological arousal	2.75; 2.5-3.0
Altruism	3.0; 2.7-3.3
Behaviors engaging higher-order empathic responding	2.0; 2.0-3.0
Total-score	44.0; 40.0-48.0

DISCUSSION

In this study, we aimed to explore the relationship between levels of empathy and burnout among medical students in their clinical years. The level of empathy among medical students showed a mean score of 44.0, which indicates below-average empathy levels (below 45). These findings are supported by those of another study that reflected that physicians' empathy may decline with clinical training[9,21]. A previous study found that medical education and clinical training both negatively impact empathy[22].

Table 2 Association of burnout with empathy, presence of psychiatric illness and stressor and mental health among medical students (n=466)

Factors of interest	Emotional exhaustion (Model 2=Adjusted R^2 0.31)		Depersonalization (Model 3=Adjusted R^2 0.18)		Low personal accomplishment (Model 4=Adjusted R^2 0.21)	
	Adjusted coefficient (95% CI)	p-value (F-test)	Adjusted coefficient (95% CI)	p-value (F-test)	Adjusted coefficient (95% CI)	p-value (F-test)
Female (Ref. male)	–	–	−1.69 (−2.81, −0.58)	0.003	–	–
Year of education:	–	–				
4th year			Ref.	<0.001	Ref.	0.019
5th year	–	–	0.65 (−0.64, 1.95)		−0.16 (−1.68, 1.37)	
6th year	–	–	3.15 (1.83, 4.48)		−1.97 (−3.51, −0.43)	
Presence of psychiatric illness	3.42 (0.29, 6.55)	0.033	–	–	–	–
Presence of stressors within a year	8.07 (3.76, 12.37)	<0.001	3.15 (0.55, 5.76)	0.018	–	–
Mental health score	−1.17 (−1.36, −0.98)	<0.001	−0.33 (−0.44, −0.22)	<0.001	−0.29 (−0.42, −0.16)	<0.001
Empathy score	0.18 (0.02, 0.33)	0.024	−0.09 (−0.18, −0.01)	0.069	−0.42 (−0.52, −0.31)	<0.001

Note: all multiple linear regression models included Physical illness (Yes); Psychiatric illness (Yes); Alcohol consumption (Yes); Substance use (Yes); Stressors within a year (Yes); Mental health score; and Empathy score and showed only significant outcomes.

Table 3 Spearman correlations of empathy with mental health and burnout score (n=466)

Variables	Burnout		
	Emotional exhaustion	Depersonalization	Low personal accomplishment
Mental health	−0.52***	−0.36***	−0.36***
Empathy			
Perception of an emotional state in another	−0.14**	−0.10*	−0.22***
Assessment of emotion comprehension in others	0.09^{ns}	0.04^{ns}	−0.25***
Assessment of emotional states in others	−0.11**	−0.26***	−0.22***
Sympathetic physiological arousal	-0.01^{ns}	−0.18***	−0.35***
Altruism	−0.11*	−0.17***	−0.41***
Behaviors engaging higher-order empathic responding	−0.11**	−0.14**	−0.27***
Total-score	−0.11*	−0.25***	−0.42***

ns=not significant (p-value>0.05); *p-value<0.05; **p-value<0.01; ***p-value<0.001

Well-being, burnout, and empathy among medical students are closely linked[6,23]. This study revealed an inverse relationship between empathy and burnout. From this study, high levels of empathy were linked to a high emotional exhaustion burnout subscale. Consistent with another study, it also reported that empathy plays a role in moral deliberation and moral action, stimulating cruelty and aggression and accounting for burnout and exhaustion[24]. Other earlier studies found that burnout was significantly higher in medical education, and it has been proposed to specifically define burnout as a pathology of care relationships[25,26]. They postulated “the Theory of

Compassion Fatigue" where physicians with exaggerated empathic abilities have more chances to experience burnout[25]. Many studies report on "compassion fatigue" which is defined as the formal caregiver's reduced capacity or interest in being empathic or bearing the suffering of clients and (is) the behavioral and emotional state that results from knowing about a traumatizing event experienced by another person[27]. This condition was found among various healthcare providers, and the risk factors included fewer healthcare qualifications and fewer years of experience[28].

Our study also found that a high level of empathy may help prevent depersonalisation and enhance personal accomplishment. Depersonalisation has been found to increase among medical students during their undergraduate studies[29]. Our finding is in agreement with studies suggesting that increased empathy may complement the prevention of burnout, as empathy is negatively associated with high burnout and correlated with lower depersonalisation[29,30]. Depersonalisation in burnout leads to dehumanisation of the doctor-patient relationship and impaired adoption of the psychological perspective of their patients and objectifying patients[25,31]. Depersonalised students may exhibit impersonal and detached behaviors. Since empathy is closely related to stronger social interactions, the reason for negative correlations between empathy and depersonalisation seems clear[29].

Empathy, particularly altruism, is related to personal accomplishments. Similarly, some studies have found that medical students' sense of personal accomplishment is positively correlated with empathy. They identified clinical empathy as a protective factor that prevents medical students from experiencing burnout[30,32,33].

Burnout consequences for the lives and mental health of medical students and physicians are important issues. Our findings show that burnout scores are negatively related to mental health and positively related to stress. Well-being goes beyond the absence of distress and is characterised by being challenged, successfully responding, and attaining satisfaction in various domains of life. Achieving a high degree of well-being may enhance compassion and the quality of care provided by physicians[14]. Medical students who experience a high degree of personal well-being and have a positive aspect of quality of life may possess higher levels of empathy and professionalism[32,34].

The importance of empathy should be emphasised in medical schools. Successful treatments depend on effective patient-physician interactions. A physician who understands each patient on a personal level has a better chance of experiencing and conveying empathy and treating the patient more effectively than physicians who do not have this level of understanding[35]. Our findings suggest that empathy remains a key factor that affects on burnout in medical students. However, during medical training, appropriate levels of empathy should be provided to medical students to prevent emotional exhaustion. This is consistent with the findings of a qualitative study of general medicine residents in which several residents designated the necessity of maintaining a distance between themselves and their patients and searching for a balanced attitude[33]. Although it is rather difficult to quantify how much empathy is sufficient or appropriate, this study suggests that emotional distress, together with past or current stressors, should be considered regularly and simultaneously in patient-physician interactions.

This was an in-depth analytical study investigating the multiple facets of burnout influenced by levels of empathy. Our study has some limitations. Assessing empathy levels using a self-reported questionnaire may not have inferred the real empathic behavior of students in their clinical practice. Nonetheless, some authors argue that empathic orientations may result in real behavior[36]. Additionally, our study had a cross-sectional design that may cause a limitation in longitudinal follow-up, thereby potentially leading to causal conclusions regarding the relationships observed in this study. Further studies with

longitudinal and multidimensional approaches to empathy, including constitutional traits, such as coping skills and personality, may contribute to clarifying the correlation of students' other specific conditions and states with their empathy levels and burnout.

CONCLUSION

A negative correlation was found between empathy and burnout. A high level of empathy may help prevent depersonalisation and enhance personal accomplishment but may not prevent emotional exhaustion or burnout. Empathy, particularly altruism, is likely to be related to personal accomplishment. The data suggest that empathy is a key factor that affects burnout in medical students; however, the disinhibition of excessive empathy should be considered to prevent emotional exhaustion. Therefore, further causal explanations must be tested.

Declarations

All methods were performed in accordance with relevant guidelines and regulations.

Ethics approval and consent to participate

This study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University (REC. 64-135-3-1). All research was conducted in compliance with the Declaration of Helsinki and the Ethical Statements of the Ethics Committee of the Faculty of Medicine, Prince of Songkla University. Participants could not be identified throughout this process. The requirement for informed consent was waived by the Medical Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Thailand.

Availability of data and materials

The qualitative data used in and analysed during the current study cannot be made publicly available for confidentiality reasons, but they can be made available on request from the corresponding author.

Author's contributions

AJ was involved in the conceptualisation and design of the study; data analysis; and drafting of the manuscript and tables. JP was involved in the conceptualisation and design of the study; data collection and analysis; and drafting of the manuscript and tables. KT was involved in the conceptualisation and design of the study; and data collection. KA was involved in the conceptualisation; analysis of the data, as well as the drafting of the manuscript, and tables. WA was involved in the conceptualisation; analysis of the data as well as the drafting of the manuscript, and tables. All the authors contributed to and approved the final manuscript.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

1. Hogan R. Development of an empathy scale. J Consult Clin Psychol 1969;33:307-16.
2. Mehrabian A, Epstein N. A measure of emotional empathy. J Pers 1972;40:525-43.
3. Carre A, Stefaniak N, D'Ambrosio F, Bensalah L, Besche-Richard C. The basic empathy scale in adults (BES-A): factor structure of a revised form. Psychol Assess 2013;25:679-91.
4. Archer E, Turner R. Empathy: an essential tool in any doctor's skillset. S Afr Med J 2018;109:11-2.
5. Elam CL. Use of 'emotional intelligence' as one measure of medical school applicants' noncognitive characteristics. Acad Med 2000;75:445-6.

6. Sathaporn K, Pitanupong J. Factors associated with the improvement of the empathy levels among clinical-year medical students in southern Thailand: a university-based cross-sectional study. BMC Psychol 2022;10:128.
7. Pitanupong J, Sangkool J, Wiwattanaworaset P, Pongthanawisut S, Teetharathul T, Jiraphan A. Dropout thought among medical students at faclty of medicine prince of songkla university. Thammasat Med J 2020;20:175-84.
8. Pitanupong J, Sathaporn K. The prevalence and factors associated with mistreatment perception among Thai medical students in a southern medical school. Siriraj Med J 2019;71:310-7.
9. Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. Acad Med 2009;84:1182-91.
10. Woloschuk W, Harasym PH, Temple W. Attitude change during medical school: a cohort study. Med Educ 2004;38:522-34.
11. Dyrbye LN, Thomas MR, Harper W, Massie FS, Jr., Power DV, Eacker A, et al. The learning environment and medical student burnout: a multicentre study. Med Educ 2009;43:274-82.
12. Ramirez AJ, Graham J, Richards MA, Cull A, Gregory WM. Mental health of hospital consultants: the effects of stress and satisfaction at work. Lancet 1996;347:724-8.
13. Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. Soc Sci Med 1997;44:1017-22.
14. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med 2002;136:358-67.
15. Bellini LM, Baime M, Shea JA. Variation of mood and empathy during internship. JAMA 2002;287:3143-6.
16. Jumroonrojana K, Zartrungpak S. Development of the jefferson scale of physician empathy-student version (Thai version). J Psychiatr Assoc Thailand 2013;57:213-24.
17. Spreng RN, McKinnon MC, Mar RA, Levine B. The toronto empathy questionnaire: scale development and initial validation of a factor-analytic solution to multiple empathy measures. J Pers Assess 2009;91:62-71.
18. Summawart S. Burnout among the staf nurses in Ramathibodi hospital. Bangkok: Mahidol University; 1989 [cited 2023 May 16]. Available from: http://mulinet11.li.mahidol.ac.th/e-thesis/scan/18486.pdf
19. Maslach C, Jackson SE. The Measurement of Experienced Burnout. J Organ Behav 1981;2:99-113.
20. Mongkol A, Huttapanom W. Thai Happiness Indicators (THI-15) [monograph on the Internet]. Nonthaburi: Department of Mental Health, Ministry of Public Health; 2011 [cited 2023 May 16]. Available from: http://www.dmh.go.th/test/qtest/
21. Sathaporn K, Pitanupong J. The relationship between mental health with the level of empathy among medical students in southern Thailand: a university-based cross-sectional study. Siriraj Med J 2021;73:832-40.
22. Chen D, Lew R, Hershman W, Orlander J. A cross-sectional measurement of medical student empathy. J Gen Intern Med 2007;22:1434-8.
23. Brazeau CM, Schroeder R, Rovi S, Boyd L. Relationships between medical student burnout, empathy, and professionalism climate. Acad Med 2010;85:S33-6.
24. Bloom P. Empathy and its discontents. Trends Cogn Sci 2017;21:24-31.
25. Thirioux B, Birault F, Jaafari N. Empathy is a protective factor of burnout in physicians: new neuro-phenomenological hypotheses regarding empathy and sympathy in care relationship. Front Psychol 2016;7:763.
26. Pitanupong J, Sathaporn K, Ittasakul P, Karawekpanyawong N. Relationship of mental health and burnout with empathy among medical students in Thailand: a multicenter cross-sectional study. PLoS One 2023;18:e0279564.
27. Figley CR. Compassion fatigue: coping with secondary traumatic stress disorder in those who treat the traumatized. New York: Routledge; 1995.
28. Sinclair S, Raffin-Bouchal S, Venturato L, Mijovic-Kondejewski J, Smith-MacDonald L. Compassion fatigue: a meta-narrative review of the healthcare literature. Int J Nurs Stud 2017;69:9-24.
29. Paro HB, Silveira PS, Perotta B, Gannam S, Enns SC, Giaxa RR, et al. Empathy among medical students: is there a relation with quality of life and burnout?. PLoS One 2014;9:e94133.
30. Lopes AR, Nihei OK. Burnout among nursing students: predictors and association with empathy and self-efficacy. Rev Bras Enferm 2020;73:e20180280.
31. Delgado N, Bonache H, Betancort M, Morera Y, Harris LT. Understanding the links between inferring mental states, empathy, and burnout in medical contexts. Healthcare (Basel) 2021;9.
32. Thomas MR, Dyrbye LN, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. How do distress and well-being relate to medical student empathy? a multicenter study. J Gen Intern Med 2007;22:177-83.
33. Picard J, Catu-Pinault A, Boujut E, Botella M, Jaury P, Zenasni F. Burnout, empathy and their relationships: a qualitative study with residents in general medicine. Psychol Health Med 2016;21:354-61.
34. Shanafelt TD, West C, Zhao X, Novotny P, Kolars J, Habermann T, et al. Relationship between increased personal well-being and enhanced empathy among internal medicine residents. J Gen Intern Med 2005;20:559-64.
35. Hirsch EM. The role of empathy in medicine: a medical student's perspective. Virtual Mentor 2007;9:423-7.
36. Hojat M. Empathy in patient care: antecedents, development, measurement, and outcomes. New York: Springer; 2007.