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Resilience and Burnout among Medical Students: The Role of Difficulties with Emotion Regulation as A Mediator

Jordan Ensz, Changiz Mohiyeddini *

Oakland University William Beaumont School of Medicine, Rochester, Michigan, U.S.; E-Mails: jlensz@oakland.edu; mohiyeddini@oakland.edu

* **Correspondence:** Changiz Mohiyeddini; E-Mail: mohiyeddini@oakland.edu

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Abstract

Burnout is a chronic state of exhaustion caused by prolonged stress. Medical training has been shown to leave many medical students vulnerable to burnout, which can negatively impact their health and patient care. While resilience has been associated with lower burnout, the mechanisms through which resilience reduces burnout are not well established. Therefore, this study aimed to investigate whether difficulties with emotion regulation mediate the relationship between resilience and burnout among medical students. For this cross-sectional study, we conducted a power analysis to determine the necessary sample size and recruited 82 medical students (mean age = 25.2, 35.4% male) to complete a questionnaire that measured burnout (Oldenburg Burnout Inventory), difficulties with emotion regulation (Difficulties in Emotional Regulation Scale), and resilience (Brief Resilience Scale). Hierarchical regression analysis was conducted to examine the mediation model. Our results indicate that difficulties with emotion regulation mediate the relationship between resilience and burnout, with a significant indirect effect of resilience on burnout. The mediation model explained 16% of the variance in burnout. In conclusion, difficulties in emotion regulation may increase the

risk of burnout among medical students. Our findings suggest that enhancing resilience and adaptive emotion regulation could help protect medical students against burnout.

Keywords
Burnout; difficulties in emotion regulation medical education; medical students; resilience

1. Introduction

It is widely recognized that medical education is a highly demanding and stressful experience, requiring significant effort, time, and financial investment. In the United States, medical education takes four years of schooling after a student has already obtained a bachelor's degree, followed by a supervised residency period of 3-7 years. The average student debt due to medical school tuition fees alone is $250,990 [1]. Medical students face intense workloads, long hours, and a requirement to complete numerous assignments, examinations, clinical rotations, and hands-on training in a fast-changing and rapidly developing educational and applied environment. Additionally, medical education is increasingly challenging due to the fast pace of technological innovations, and medical students are continuously evaluated and assessed on their knowledge and skills. Evidence suggests that medical students spend an average of 51 hours per week on their education [2] and 40% of the medical students report no leisure time at all [3]. Focusing on the health of others, combined with these heavy demands, can negatively impact the personal health and well-being of medical students. Scientific evidence indicates that medical students are more likely to suffer from burnout, depression, anxiety, and suicide than the general population [4, 5].

Burnout is a state of emotional, physical, and mental exhaustion caused by prolonged stress, and it is described in the 11th edition of the International Classification of Diseases (ICD-11) as a syndrome resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: feelings of energy depletion or exhaustion, increased mental distance from one's job or feelings of negativism or cynicism related to one's job, and reduced professional efficacy [6]. Recent empirical evidence indicates that the prevalence rate of burnout among healthcare professionals is increasing. For example, a 2013 Medscape Lifestyle Report, which surveyed over 20,000 physicians, found that 40% of participants satisfied the requirements for burnout diagnosis, while their 2017 report found that 51% now fell into the category [7]. Furthermore, research suggests that burnout in physicians and physicians in training has detrimental effects on the quality of care for patients [8]. Therefore, mitigating the growing burnout rates, particularly in the medical field, is crucial for both individual and public health.

Psychological theories on mental health and well-being consistently highlight resiliency as a potential protective factor against burnout [9-11]. Resiliency refers to a dynamic process that addresses one's ability to "bounce back" or positively adjust when faced with trauma, significant stress, or adversity [12-15].

The link between resiliency and burnout has been extensively researched in the healthcare sector [16-18] and among medical students [19]. However, the specific mechanism through which resiliency protects individuals from burnout is not yet fully understood. Two lines of inquiry suggest that emotion regulation could partially mediate the link between resiliency and burnout.

Firstly, burnout is usually characterized as a multidimensional construct, constituted by three dimensions: emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. As emotional exhaustion is a core dimension of burnout, it is not surprising that emotions and emotional distress play a key role in many conceptualizations of burnout and its pathogenesis [20]. In general, healthy individuals possess the capacity to regulate their emotions to adaptively respond to constantly changing environmental demands [21-23]. However, empirical findings show that individuals suffering from burnout experience prolonged phases of negative emotions such as anger, disappointment, or sadness, indicating a diminished capacity to down-regulate negative emotions and struggle to maintain positive emotional experiences [24, 25].

Secondly, and in a related vein, Britt, Shen, Sinclair, Grossman, and Klieger [26] highlight that all definitions of resilience involve experiencing significant adversity. Therefore, it is reasonable to assume that this experience of adversity is inherently emotional and requires well-developed and adaptive emotion regulation skills. Consequently, individuals facing adversity such as chronic job or education-related stress may be more susceptible to developing burnout if they lack the ability to regulate their (negative) emotions effectively. Therefore, it seems plausible to conclude that these findings suggest that an emotion regulation framework might be useful both for understanding burnout and resilience and their association in order to develop more targeted and effective treatments for burnout.

Therefore, the aim of the present study is to investigate whether difficulties in emotion regulation are a potential mechanism through which resiliency and burnout are associated. Difficulties in emotion regulation (DERS) refer to deficiencies in the ability to attenuate and modulate negative emotional states or inhibit inappropriate or impulsive behaviors that are in discordance with desired goals and the demands of the situation [27]. Empirical evidence shows that DERS is linked with the development, maintenance, and progression of a broad range of mental health issues such as eating disorders, mood disorders, borderline personality disorder, PTSD, and alcohol addiction [28-35].

To our knowledge, no previous study has developed a mediation framework to study the link between resilience and burnout. Therefore, this study hopes to contribute to the existing literature in several ways. Firstly, this study aims to answer the call for more research to explain high burnout rates among medical students. Secondly, adapting an emotion regulation framework for understanding burnout and resiliency and their association adds to the existing literature on resiliency and burnout, and offers a new perspective on the treatment and prevention of burnout. Lastly, we hope to contribute to the growing body of research that acknowledges that emotion regulation plays a key role in human well-being.

H1: Self-reported resilience will be negatively associated with both self-reported DERS and burnout. Higher manifestations of resiliency will be associated with a lower level of DERS and burnout. H2: DERS and burnout will be positively associated. Higher levels of self-reported difficulties with emotion regulation will be linked with higher levels of self-reported burnout. H3: Self-reported DERS will mediate the link between self-reported resilience and burnout (mediation hypothesis). We expect a significant indirect effect of resiliency on burnout through DERS.

2. Methods

2.1 Power Analysis

Power analyses based on normative standard deviations for a primary outcome measure (burnout), at a significance level of 0.05, a desired power of 0.95, and a small to medium effect size indicated a total sample size between N = 111 persons (Cohen's d = 0.3) and N = 79 persons (Cohen's d = 0.35) would be required to establish the function of DERS as a mediator.

2.2 Sample and Procedure

Medical students at Oakland University William Beaumont School of Medicine were invited to participate in this study between December 2020 and May 2021 via university email. IRB approval was obtained through the Oakland University Institutional Review Board. Students were provided with a link to the online survey, and informed consent was obtained. Ninety students responded to the survey. Eight subjects were excluded; four started but did not finish the survey, and four were duplicates based on personal identifiers and were removed. The final sample consisted of 82 medical students (64.6% were female) with an average age of 25.24 years (SD = 3.16).

2.3 Measurements

The questionnaire contained socio-demographic information and measurements of burnout, DERS, and resilience:

Burnout was measured using the Oldenburg Burnout Inventory (OBI) [36]. The OBI contains two subscales that measure two core dimensions of burnout: exhaustion and disengagement. The Disengagement subscale (eight items) refers to distancing oneself from the object and the content of one's work and to negative, cynical attitudes and behaviors toward one's work. Exhaustion is described as a consequence of intensive physical, affective, and cognitive strain (i.e., as a long-term consequence of prolonged exposure to job-related stress and demands) using eight items. For both subscales, a 4-point response format is used (1 = strongly disagree, 4 = strongly agree). The exhaustion and disengagement subscales showed good reliability in this study, with Cronbach's alpha of 0.77 and 0.71 for exhaustion and disengagement, respectively. A high score on OBI indicates high levels of burnout.

Resilience was measured using the Brief Resilience Scale (BRS), which contains six items that measure perceived ability to bounce back or recover from stress (e.g., "I tend to bounce back after hard times"). The BRS uses a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". The BRS showed high reliability in this study, with a Cronbach's alpha of 0.85. A high score on the BRS indicates high levels of resilience.

The Difficulties in Emotion Regulation was measured using the difficulties in Emotion Regulation Scale (DERS) [27]. DERS is a 36-item questionnaire designed to measure emotion dysregulation. It consists of six subscales: Non-Acceptance of Emotional Responses (e.g., "When I'm upset, I feel guilty for feeling that way"), Difficulties Engaging in Goal-Directed Behaviour (e.g., "When I'm upset, I have difficulty focusing on other things"), Impulse Control Difficulties (e.g., "When I'm upset, I feel out of control"), Lack of Emotional Awareness (e.g., "When I'm upset, I take time to figure out what I'm really feeling"), Limited Access to Emotion Regulation Strategies (e.g., "When I'm upset, I believe

that wallowing in it is all I can do"), and Lack of Emotional Clarity (e.g., "I have difficulties making sense out of my feelings"). Each item is assessed using a 5-point Likert scale that spans from "almost never" (0-10%) to "almost always" (91-100%). All the subscales within the DERS exhibited strong reliability, as evidenced by Cronbach's alphas falling within the range of 0.81 to 0.88. A high DERS score reflects significant challenges in regulating emotions.

2.4 Analytical Approach

Prior to the statistical analyses, quality checks of the database were carried out to identify potential encoding errors and aberrant values.

All calculations were performed using SPSS v.29 (SPSS Inc., Chicago, IL). Data are presented as mean ± SD. Cases with missing data were excluded list-wise. Prior to conducting statistical procedures, data were tested for normal distribution using the Kolmogorov-Smirnov test. As there was positive skew in the burnout, BRS, and data, a log transformation was applied to provide the best correction. The association between BRS, DERS, and burnout data was described by computing Pearson's correlation coefficients (two-tailed).

To examine the indirect effects of resilience on burnout, a hierarchical linear regression analysis was conducted using BRS (the predictor), DERS (the mediator), and burnout (the outcome) as continuous variables. All variables were standardized to ensure that different metrics used to measure the variables were equated [37]. Gender was entered as a covariate into the equation in the first step, and BRS and DERS were entered in the second step. A significant effect of the mediator (DERS) on burnout in the presence of the predictor (BRS) indicates a mediation effect.

3. Results

Age was not found to be significantly associated with BRS, DERS, or burnout, and therefore it was not included in further analysis.

Compared to male participants (M = 2.00, SD = 0.62), female participants (M = 2.45, SD = 0.63) reported significantly higher levels of resilience (t = 2.01, p < 0.001).

Descriptive statistics and bivariate correlations between the variables are presented in Table 1.

Table 1 Descriptive statistics and correlations of OBI, DERS, and BRS.

	OBI	BRS	DERS
OBI			
BRS	0.17		
DERS	0.39 **	-0.60 **	
Mean	2.29	2.30	1.91
SD	0.38	0.67	0.65

** p < 0.01. OBI = Oldenburg Burnout Inventory, BRS = Brief Resilience Scale, DERS = Difficulties in emotion regulation

The results of the correlation analysis showed that high levels of resilience were negatively correlated with difficulties in emotion regulation (r = -0.43, p < 0.001). High levels of difficulties in emotion regulation were positively correlated with burnout (r = 0.42, p < 0.001). In contrast, the

correlation between resilience and burnout was not significant (r = -0.06, p = 0.557). However, as Hayes [38] states "Mediation analysis as practiced in 21st century no longer imposes evidence of simple association between X [the predictor] and Y [the outcome variable] as a precondition".

The results of the hierarchical linear regression analysis investigating the mediation effect of DERS are reported in Table 2.

Table 2 Testing standardized mediation effects of difficulties in emotion regulation (DERS) using a hierarchical multiple regression (n = 84, * p < 0.05).

Step and variables	*B*	*SE B*	95% CI	*β*	R^2	Δ R^2
Step 1						
DERS	-0.13	0.07	-0.16,0.13	-0.02		
Step 2						
Resilience	-0.02	0.06	-0.15, -0.07	-0.04		
Gender	0.22	0.07	0.09, 0.14	0.42	0.15	0.001

DERS = Difficulties in emotion regulation, CI = confidence interval.

The results revealed that the direct effect of DERS on burnout was significant (β = 0.42, p = 0.001). In addition, the indirect effect of resilience on burnout through DERS (β = -0.25, p < 0.05) was significant, supporting H3. Accordingly, DERS mediates the link between resilience and burnout. The higher the level of resilience, the lower the level of DERS, which in turn is associated with a lower level of burnout. The mediation model explains 16% of the total variance in burnout.

Figure 1 depicts the results of the mediation analysis.

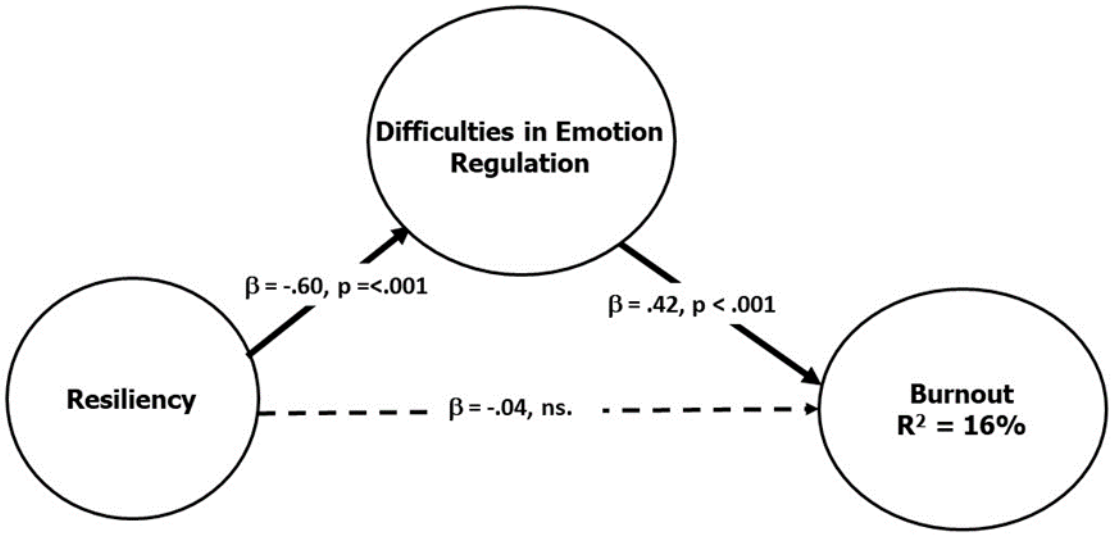

Figure 1 Difficulties in emotion regulation mediates the link between resiliency and burnout.

4. Discussion

The mental health and wellness of medical students is a crucial, but often overlooked aspect in educating competent and successful physicians. It is well-known that the educational pathway to become a doctor is long and strenuous, rife with obstacles that must be quickly overcome to keep

up with demands. The increasing acknowledgement of mental health struggles of healthcare workers, along with efforts to destigmatize them, has called attention to the high levels of burnout and distress for medical students, physicians, and other healthcare providers compared to the general public. The focus of this study on medical students aimed to identify potential mechanisms of change to inform evidence-based prevention programs to decrease burnout and improve the mental health of medical students. Investigating burnout among students is especially crucial in the wake of the COVID-19 pandemic.

The present study extended previous evidence for the adaptive benefits of resilience. The strong negative correlation between resilience and DERS suggests that resilience comprises adaptive emotion regulation capabilities that enable individuals to respond adaptively to situational demands and in accordance with individual goals. Furthermore, the non-significant association between resilience and burnout shows that the link between these two variables is more complex and, hence, adapting a mediation framework is a novel approach to understanding the underlying mechanisms. This approach not only contributes to advancing our understanding of the link between resilience and burnout but may also help us identify factors that more directly influence burnout that could be used in interventions against burnout.

Many medical school curriculums have already implemented wellness initiatives aimed at improving mental health, with some including presentations on financial skills, educational pathways, or simply “white space” for students to do what they believe will help their mental state. While it is unrealistic to use these curriculums as therapy sessions for all students to individualize the topics, providing students with the knowledge base to target specific areas could prove beneficial. Focusing on skills that can be learned and developed, such as resiliency and adaptive emotional regulation, are actionable tasks to decrease burnout levels.

Although the evidence provided in this study is indirect, it is consistent with the myriad of research findings on resilience, emotion regulation, and burnout.

5. Limitations

There are several limitations to the present study. The first and major limitation concerns the cross-sectional nature of the study, which prohibits making any causal inferences. Additionally, although the sample size falls within the range indicated by power analysis, it may still be considered small for a representative sample of medical students. Moreover, the data on resilience, DERS, and burnout were obtained solely from medical students, which may have led to stronger associations between variables due to shared method variance. Hence, the results of this study should be replicated in longitudinal studies with larger samples, using objective measurements (e.g., clinical diagnosis of burnout). Nevertheless, despite these limitations, our study provides valuable insights that can inspire future longitudinal research exploring the associations between resilience, DERS, and burnout, including the use of objective data (e.g., clinical assessments of burnout)."

Author Contributions

This paper represents the doctoral research of the first author, aimed at obtaining an MD degree. The study was conducted under the supervision of the second author. Both authors equally contributed to all facets of the paper: conceptualization and design, data collection and analysis,

manuscript writing (including introduction, methods, results, and discussion), critical review, and final approval.

Competing Interests

The authors have declared that no competing interests exist.

References

1. Melanie Hanson. Average Medical School Debt [Internet]. EducationData.org; 2022. Available from: https://educationdata.org/average-medical-school-debt.
2. 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: 1377-1385.
3. Peleias M, Tempski P, Paro HB, Perotta B, Mayer FB, Enns SC, et al. Leisure time physical activity and quality of life in medical students: results from a multicentre study. BMJ Open Sport Exerc Med. 2017;3: e000213. doi: 10.1136/bmjsem-2016-000213.
4. 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: 358-367.
5. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Acad Med. 2006; 81: 354-373.
6. World Health Organization. Burn-out an "occupational phenomenon": International Classification of Diseases [Internet]. Geneva, Switzerland: WHO Headquarters in Geneva; 2019. Available from: https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases.
7. Peckham C, Grisham S. Medscape lifestyle report 2017: Race and ethnicity, bias and burnout [Internet]. New York: Medscape; 2017. Available from: https://www.medscape.com/features/slideshow/lifestyle/2017/overview#page=1.
8. Reith TP. Burnout in United States healthcare professionals: A narrative review. Cureus. 2018; 10: e3681.
9. Bonanno GA. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? Am Psychol. 2004; 59: 20-28.
10. Matos PS, Neushotz LA, Griffin MT, Fitzpatrick JJ. An exploratory study of resilience and job satisfaction among psychiatric nurses working in inpatient units. Inter J Mental Health Nurs. 2010; 19: 307-312.
11. Meredith LS, Sherbourne CD, Gaillot SJ, Hansell L, Ritschard HV, Parker AM, et al. Promoting psychological resilience in the US military. Rand Health Q. 2011; 1: 2.
12. Bonanno GA. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? Psychol Trauma. 2008; S: 101-113. doi: 10.1037/1942-9681.S.1.101.
13. McCleary J, Figley C. Resilience and trauma: Expanding definitions, uses, and contexts. Traumatology. 2017; 23: 1-3.
14. Rubin E. Surviving the Holocaust: Trauma and resiliency in Later Life. J Gerontol Soc Work. 2020; 63: 139-142.

15. Tsai J, Harpaz-Rotem I, Pietrzak RH, Southwick SM. Trauma resiliency and posttraumatic growth. In: APA handbook of trauma psychology: Trauma practice. Washington, DC: American Psychological Association; 2017. pp. 89-113.
16. Arrogante O, Aparicio-Zaldivar E. Burnout and health among critical care professionals: The mediational role of resilience. Intensive Crit Care Nurs. 2017; 42: 110-115.
17. Buck K, Williamson M, Ogbeide S, Norberg B. Family physician burnout and resilience: A cross-sectional analysis. Fam Med. 2019; 51: 657-663.
18. Wang C, Grassau P, Lawlor PG, Webber C, Bush SH, Gagnon B, et al. Burnout and resilience among Canadian palliative care physicians. BMC Palliative Care. 2020; 19: 169.
19. Patel V, Brackman S, Shafi U, Causey A, Melnik Allen L, Dittmar A, et al. Overview of an emergent, arts-based resiliency curriculum to mitigate medical trainee burnout. Arts Health. 2021; 13: 98-106.
20. O'Connor K, Neff DM, Pitman S. Burnout in mental health professionals: A systematic review and meta-analysis of prevalence and determinants. Eur Psychiatry. 2018; 53: 74-99.
21. Gross JJ. Emotion regulation: Current status and future prospects. Psychol Inq. 2015; 26: 1-26.
22. Houben M, Van Den Noortgate W, Kuppens P. The relation between short-term emotion dynamics and psychological well-being: A meta-analysis. Psychol Bull. 2015; 141: 901-930.
23. Kuppens P, Allen NB, Sheeber LB. Emotional inertia and psychological maladjustment. Psychol Sci. 2010; 21: 984-991.
24. Alessandri G, De Longis E, Cepale G. Emotional inertia emerges after prolonged states of exhaustion: Evidences from a measurement burst study. Motiv Emotion. 2021; 45: 518-529.
25. De Longis E, Alessandri G, Ottaviani C. Inertia of emotions and inertia of the heart: Physiological processes underlying inertia of negative emotions at work. Int J Psychophysiol. 2020; 155: 210-208.
26. Britt TW, Shen W, Sinclair RR, Grossman MR, Klieger DM. How much do we really know about employee resilience? Ind Organ Psychol. 2016; 9: 378-404.
27. Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. J Psychopathol Behav Assess. 2004; 26: 41-54.
28. Aldao A, Gee DG, De Los Reyes A, Seager I. Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. Dev Psychopathol. 2016; 28: 927-946.
29. Berking M, Wupperman P. Emotion regulation and mental health: Recent findings, current challenges, and future directions. Curr Opin Psychiatry. 2012; 25: 128-134.
30. Berking M, Wirtz CM, Svaldi J, Hofmann SG. Emotion regulation predicts symptoms of depression over five years. Behav Res Ther. 2014; 57: 13-20.
31. Gratz KL, Weiss NH, Tull MT. Examining emotion regulation as an outcome, mechanism, or target of psychological treatments. Curr Opin Psychol. 2015; 3: 85-90.
32. Lavender JM, Wonderlich SA, Engel SG, Gordon KH, Kaye WH, Mitchell JE. Dimensions of emotion dysregulation in anorexia nervosa and bulimia nervosa: A conceptual review of the empirical literature. Clin Psychol Rev. 2015; 40: 111-122.
33. Sheppes G, Suri G, Gross JJ. Emotion regulation and psychopathology. Ann Rev Clin Psychol. 2015; 11: 379-405.

34. Sloan E, Hall K, Moulding R, Bryce S, Mildred H, Staiger PK. Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. Clin Psychol Rev. 2017; 57: 141-163.
35. Van Rheenen TE, Murray G, Rossell SL. Emotion regulation in bipolar disorder: Profile and utility in predicting trait mania and depression propensity. Psychiatry Res. 2015; 225: 425-432.
36. Demerouti E, Bakker AB. The Oldenburg Burnout Inventory: A good alternative to measure burnout and engagement. Handb Stress Burnout Health Care. 2008; 65: 1-25.
37. Dunlap WP, Kemery ER. Failure to detect moderating effects: Is multicollinearity the problem? Psychol Bull. 1987; 102: 418-420.
38. Hayes AF. Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York, London: The Guilford press; 2017.