SELF-ESTEEM NEGATIVELY CORRELATED WITH STRESS-RELATED EATING AMONG MEDICAL STUDENTS AFTER PANDEMIC ERA

Gyang Hanandita Gusti Putri[1], Frilya Rachma Putri[2], Nia Kurnianingsih[3,4]*
[1]Bachelor Study Program of Medicine, Universitas Brawijaya, Indonesia
[2]Department of Psychiatry, Faculty of Medicine, Universitas Brawijaya, Indonesia
[3]Department of Physiology, Faculty of Medicine, Universitas Brawijaya, Indonesia
[4]Research Center of Smart Molecule and Natural Genetics Resources,
Universitas Brawijaya, Indonesia

*Email: nia_fkub@ub.ac.id

ABSTRACT
Pandemic of Coronaviruses Disease-19 (COVID-19) negatively influenced the mental health particularly stress and eating disorder among medical students. Previous study focused on the relationship between stress and self-esteem or eating disorders. The link between self-esteem and stress-related eating remains underexplored in the post pandemic era. This study was purposed to evaluate the relationship between self-esteem and stress-related eating among medical students after pandemic of COVID-19. This cross-sectional study involved second and third year undergraduate medical students in Universitas Brawijaya during June – July 2022. A set of self-reported questionnaires included Rosenberg Self-Esteem Scale (RSES) and Dutch Eating Behavior Questionnaire – Emotional Eating Subscale (DEBQ-E) for measure the self-esteem and stress-related eating respectively. The form was filled in through online media. Students with previous history of eating disorders before pandemic as well as incomplete questionnaire data were excluded from study. Spearman correlation was used for statistical analysis. Ninety-two students filled in the questionnaire, only 34 students met the inclusion criteria. About 64.71% of students had low self-esteem. High stress-related eating identified in 41.18% students, particularly females. Self-esteem negatively associated with stress-related eating among participants (Spearman's rho = -0.424; p = 0.017). Higher self-esteem decreased stress-related eating. Future studies are necessary to explore the broad range of stress sources and its impact on eating disorders among larger population.

KEYWORDS:
COVID-19; medical student; self-esteem; stress-related eating

INTRODUCTION

The dramatic Coronavirus Disesase-19 (COVID-19) pandemic resulted stress among people worldwide(WHO, 2022). Stressful situations burden the medical student as vulnerable population during pandemic. Academic transition to online approach pretended to be the main source of stress in medical students(O'Byrne et al., 2021). As government mandatory for social distancing policies in education sector, the level of stress among student increased due to the limitations of direct communication and affiliation, whereas students at young age need more social interaction. Their social acceptance and social

feedback from peers are considered as important factors of their socio-emotional health, including self-esteem (Ahmed MA, 2016; Fitriyana et al., 2021; Zhao et al., 2021).

Despite self-esteem, a broad range of restriction environment triggered anxiety, depression and loneliness thus worsened the eating disorder symptoms (Gao et al., 2022). Previous study reported the relationship of higher stress with binge eating disorder among adolescents and young adults during pandemic (Freizinger et al., 2022). In correlation, higher media exposure during lockdown situation linked to acute and severe eating disorder because of the worsened of body rumination (Martini et al., 2023). Body shape concerns, reliance on video conference and fear of diseases contagion were the potential factors for exacerbate the eating disorders. On fact, evaluating and assessing factors associated with eating disorder during pandemic is essential for recovery sources (Lombardo et al., 2020). Numerous studies concerned to discuss the relationship between stress itself with self-esteem or eating disorders. Importantly, long-term chronic stress that correlated with pandemic was demonstrated in earlier study (Qi et al., 2021) as well as the stress related eating behavior persisted during post pandemic (Łaskawiec et al., 2022). However, as deep of the knowledge limitation exploration to reveal the relationship between self-esteem and eating disorder after the pandemic. Thus, this study aimed to reveal the relationship of self-esteem and stress-related eating during the post pandemic period.

RESEARCH METHODS

Ethical considerations
This study has been ethically approved by the Health Research Ethics Committee of Faculty of Medicine of Universitas Brawijaya (No. 118/EC/KEPK/-S1-PD/05/2022).

Research procedures
This cross-sectional study involved second- and third-year medical students of Bachelor Study Program of Medicine of Universitas Brawijaya in June-July of 2022. Students with previous history of eating disorders and low self-esteem before the pandemic were excluded from study. Informed consent was assigned from respondents before study participation. A self-reported questionnaire was delivered to respondents through the online form approach.

Questionnaire
A set of questionnaires consisted of sociodemographic questions, Rosenberg's Self-Esteem Scale (RSES for self-esteem level measurement (Martín-Albo et al., 2007) and Dutch Eating Behavior Questionnaire – Emotional Eating Subscale (DEBQ-E) to measure the stress-related eating(de Carvalho et al., 2023).

Statistical analysis
Collected data were tabulated using Microsoft Excel and were analyzed using Software Statistical Product and Service Solution (SPSS) 26 with Spearman's correlation (p < 0,05).

RESULTS AND DISCUSSION

A total of 92 students completed the questionnaires. Six students were excluded from study because have been suffering from eating disorders since before the pandemic era. Most subjects were 19 years of age (45.35%). Female students (75.58%) were more dominant than male. About half of the subjects were third year students (58.14%). Normal body mass index was identified in 60.47% of students (Table 1).

Table 1. Characteristics of Respondents

Characters	n (%)
Age (years)	
18	12 (35.29)
19	15 (44.12)
20	6 (17.65)
21	1 (2.94)
Gender	
Male	7 (20.59)
Female	27 (79.41)
Year of Study	
2	12 (35.29)
3	22 (64.71)
Body Mass Index (BMI)	
Heavily Underweight	3 (8.82)
Underweight	6 (17.65)
Normal	19 (55.88)
Overweight	3 (8.82)
Obese	3 (8.82)

Low self-esteem was more frequent in younger students, female and third year students. Higher level of stress-related eating was identified in younger students, female and second year students. Interestingly, most of the students with low self-esteem and high stress-related eating were classified in normal body mass index (Table 2). Higher levels of stress-related eating were mostly identified in students who have low self-esteem with the significant value (p=0.017) and negative correlation (R=-0.424). This indicates the lower self-esteem correlated with higher stress-related eating and vice versa. (Table 3).

Table 2. Frequency Distribution of Characteristics of Respondents to Self-Esteem and Stress-Related Eating Level

Characters	Self-Esteem Level		Stress-Related Eating Level		
	Low n (%)	High n (%)	Low n (%)	Normal n (%)	High n (%)
Age (years)					
18	9 (26.47)	3 (8.82)	1 (2.94)	4 (11.76)	7 (20.59)

19	10 (29.41)	5 (14.71)	5 (14.71)	3 (8.82)	7 (20.59)
20	3 (8.82)	3 (8.82)	3 (8.82)	3 (8.82)	0 (0)
21	0 (0)	1 (2.94)	1 (2.94)	0 (0)	0 (0)
Gender					
Male	3 (8.82)	4 (11.76)	2 (5.88)	5 (14.71)	0 (0)
Female	19 (55.88)	8 (23.53)	8 (23.53)	5 (14.71)	14 (41.18)
Year of Study					
2	6 (17.65)	6 (17.65)	4 (11.76)	7 (20.59)	11 (16.28)
3	16 (18.60)	6 (17.65)	6 (17.65)	3 (8.82)	3 (8.82)
Body Mass Index (BMI)					
Heavily Underweight	1 (2.94)	2 (5.88)	2 (5.88)	0 (0)	1 (2.94)
Underweight	4 (11.76)	2 (5.88)	3 (8.82)	1 (2.94)	2 (5.88)
Normal	14 (41.18)	5 (14.71)	4 (11.76)	7 (20.59)	8 (23.53)
Overweight	1 (2.94)	2 (5.88)	1 (2.94)	1 (2.94)	1 (2.94)
Obese	2 (5.88)	1 (2.94)	0 (0)	1 (2.94)	2 (5.88)
TOTAL	22 (64.71)	12 (35.29)	10 (29.41)	10 (29.41)	14 (41.18)

Table 3. Frequency Distribution of Self-Esteem to Stress-Related Eating Level

		Stress-Related Eating		
		Low; n (%)	Normal; n (%)	High; n (%)
Self-Esteem	Low; n (%)	4 (11.76)	7 (20.59)	11 (32.35)
	High; n (%)	6 (17.65)	3 (8.82)	3 (8.82)

Table 4. Correlation Test Result of *Self-Esteem* and *Stress-Related Eating Level*

Relation		p-value	Spearman's Correlation
Variable 1	Variable 2		
Self-Esteem	*Stress-Related Eating*	0.017	-0.424

Self-esteem refers to individual belief towards self-values, performances, abilities, and social interaction. Self-esteem is a global indicator of individual views about themselves (Ahmed

MA, 2016; Zhao et al., 2021). Positive self-esteem indicates high value of self-worth perspective which is crucial for mental well-being (Zhao et al., 2021).

Self-esteem among medical students varied across countries. Both overestimate and underestimate of self-evaluation were reported different among skills subjects in medical education settings. Communication skills and knowledge-based performance were reported as major positive self-esteem. Conversely, test scores were revealed as major cause of negative self-esteem among medical students(Blanch-Hartigan, 2011). Self-esteem also influenced self-confidence to reach professional competencies(Egwu et al., 2011).

This work reported low self-esteem among medical students in Indonesia setting during pandemic era. Similar low self-esteem was demonstrated in India, Ethiopia, and Australia (Gidi et al., 2021; Lyons et al., 2020; Yadav et al., 2022). Lower self-esteem was shown in Australian medical students during pandemic. Less clinical experiences and ineffective online learning resulted in low self-confidence to become clinical doctor (Lyons et al., 2020). Other factors such as gender, mental condition, social environmental support, and academic capability affected self-esteem of medical students. Lower self-esteem correlated with multifactorial such as lack of motivation, body image and pandemic itself (Gidi et al., 2021; Lyons et al., 2020; Sehlo et al., 2018; Virk & Singh, 2020).

Stress strongly correlated with lower self-esteem. Higher educational stress, poor academic performance and attendance in supplementation class were associated with low self-esteem in medical students. Students with low self-esteem had higher risks to having anxiety and depression (Nguyen et al., 2019). Higher stress remains a crucial issue among medical students during COVID-19 pandemic. Because in the pandemic era, multiple assessment required extensive homework to students with high load of effort. The sequences of modules without sufficient study time emerged stressful situation among medical students in the pandemic curriculum adjustment (Atta & Almilaibary, 2022). Interestingly, online learning transition was not assigned into great contributor of stress in medical students during pandemic. Online method reported as moderate contributor of stress in Ireland. Similarly, the combination of half online and conventional learning was preferred by most medical students in Indonesia (Mahardani et al., 2021; O'Byrne et al., 2021).

Stress is associated with a broad range of behaviors, including eating behavior. Physiologically, response towards chronic stress involves hormonal pathway that increase firing rate of reward-associated region in brain thus promote appetite (Stammers et al., 2020). The hyperpalatable state during stress drives choice into comfort food to relieve the stress. This imbalance leads to weight gain and promotes obesity (Yau & Potenza, 2013). Current work demonstrates the higher stress-related eating among female medical students. This correlates with previous report in similar curriculum setting of medical school in Indonesia during pandemic (Abdurrahman et al., 2022). Stress as an underlying cause of emotional eating was revealed in a previous study. Emotional eating can be represented as eating fast food, snack and sandwich (Penaforte et al., 2016).

This study found an inverted correlation between self-esteem and stress-related eating. This indicates high self-esteem correlated with low stress-related eating. The correlation between self-esteem and stress-related eating was described in previous work. Subjects with higher academic self-esteem displayed decreased of emotional eating (Chamberlin et al., 2018). A similar finding showed in previous study that revealed low self-esteem is correlated with high Eating Disorder Inventory (EDI) score19. It assumed that the effect of self-esteem on stress-related eating is mediated by stress, thus generates coping mechanism to unhealthy eating(Virk & Singh, 2020).The further impact is necessary to be anticipated since it can be interrupting the body mass index into overweight or obesity (Lyons et al., 2020). Future evaluations need to be done for broad effect of stress in quality of life among medical students.

CONCLUSION

This study concluded a negative correlation between self-esteem and stress-related eating among medical students after COVID-19 pandemic.

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