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MINDFULNESS, PERCEIVED STRESS AND COPING STRATEGIES DURING COVID-19 PANDEMIC IN TURKISH DENTISTRY STUDENTS

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ABSTRACT

Purpose: The aim of the present study was to evaluate the association between perceived stress, mindfulness and coping strategies of undergraduate dental students during the COVID-19.

Material and Methods: A cross-sectional study was conducted among 128 undergraduate dental students in 3rd, 4th and 5th grade. Students completed surveys including the Perceived Stress Scale (PSS), the Mindful Attention and Awareness Scale (MAAS) and the Coping Orientation to Problems Experienced inventory (COPE). Data were analyzed using the Mann–Whitney U-test, Analysis of Variance, Student's t-test, Kruskal Wallis test and Spearman correlation.

Results: A negative association was found between the MAAS and PSS according to the Spearman's correlation coefficient (r_s =-0.823, p<0.001). There were positive relationships between MAAS and COPE inventory subscales of positive reinterpretation and growth (r_s = 0.385, p < 0.001); use of instrumental social support (r_s = 0.233, p = 0.008); active coping (r_s = 0.384, p < 0.001); use of emotional social support (r_s = 0.208, p = 0.018); planning (r_s = 0.244, p = 0.005). There were negative relationships between MAAS and COPE inventory subscales of behavioral disengagement (r_s =-0.245, p = 0.005); alcohol-drug use (r_s =-0.233, p = 0.008).

Conclusion: Dental students with a high level of mindfulness had a low level of perceived stress. The findings may guide the mindfulness-based stress reduction programs or stress awareness lectures development and implementation within the academic curriculum.

Keywords: COVID-19, dental undergraduate students, mindfulness, perceived stress, coping strategies

INTRODUCTION

Dental education is known to be a challenging and stressful fields of study (1). Dental students are faced with multi-factorial challenges that lead to stress; these include heavy academic curriculum, clinical requirements, complicated treatments, anxious patients, lack of time for self-care, social expectations, financial problems and any more (2,3). In the pre-clinical years, the main focus of students is theoretical learning, whereas in the clinical part of their training, the primary focus is on patient care. Pre-clinical students specified that exams and concern of failure caused the most stress, while for clinical dental students' the primary stress factor was related to meeting clinical requirements (4).

The epidemic of the Coronavirus disease 2019 (COVID-19) has had a negative impact on the dental student's daily routines and dental education system. Dental students were defined in the high-risk group due to potential exposure to coronavirus, the clinical

and preclinical activities were suspended. Education had to change to distance learning from conventional face-to-face and hands-on training. Loch et al.(5) researched dental students' perceptions of health risks and effects on clinical performance during the COVID-19 and reported that the majority of dental students pointed out that their stress levels increased since their health was at risk. Hakami et al.(6) showed that the stress, depression and anxiety levels of dental students increased during the COVID-19 epidemic in Saudi Arabia. Agius et al.(7) revealed that one of the most important reasons of stress in dental students during the COVID-19 pandemic was changing in examination procedures and the loss of manual dexterity of the other.

High stress levels can cause a variety of psychological and physical distress which affects the well-being of the student.   It can cause gastrointestinal symptoms, loss of appetite, depression, anxiety, sleeplessness, dizziness, fatigue and tachycardia (8-10). Furthermore, a significant relationship between high stress levels and immune system function measured by salivary IgA was demonstrated (11, 12).

Mindfulness has been robustly associated with psychological well-being and lower levels of stress (13, 14). Mindfulness refers to paying oriented attention to the current moment without making any judgment (15). Advanced mindfulness ensures an increase in self-compassion levels of the person and in this way the individual becomes less impacted by a negative affective state (16). Mindfulness is an innate humane trait and can be developed with practice (17). Weinstein et al.(18) reported that higher levels of awareness are associated with the use of more adaptive (more approach, less avoidant) coping style. Aforementioned findings are promising in showing that mindfulness has beneficial effects on perceived stress and coping styles. No study has investigated the association between perceived stress, mindfulness and coping strategies in dental students. The present study aimed to investigate the relationship between perceived stress, mindfulness and coping strategies of undergraduate dental students during the COVID-19 outbreak.

MATERIAL AND METHODS
Participants and Setting
The undergraduate dental curriculum at the University of Istanbul Okan is comprised of two years of preclinical training and three years of clinical training on patients in different departments. Turkish dental students begin patient-based learning through direct clinical care in their third year of faculty education.

The cross-sectional study was conducted among the third-to fifth-grade dental students in the Faculty of Dentistry during the spring semester of the academic year 2019-2020. Of the 128 respondents (53 male, 75 female), 54 were third-year dental students, 40 were fourth year, and 34 were fifth-year dental students. Informed consent was obtained before data were collected from the participants.

All procedures conducted were approved by the Ethical Committee of Istanbul Okan University, prior to beginning the study (25.09.2019/113/4).

Outcome Measures
To evaluate the COVID-19 outbreak related stress, the Perceived Stress Scale (PSS) was used which is a 14-question self-report stress assessment instrument (19). The PSS evaluates the stress level by measuring how often the person felt about the relevant subject during the last month is consist of seven negative and seven positive items. Each item is rated on a five-point Likert scale from 0 = 'never' to 4 = 'very often'. The PSS scores are acquired by reversing the positive questions and then summing the 14 questions. In this way, the total PSS points range from a low of 0 to a high of 56. Additionally, the higher scores indicate a greater perception of stress. The Turkish PSS's validity and reliability was carried out by Eskin et al.(20). Cronbach's alpha coefficient was reported as 0.84.

The coping styles measured with the Coping Orientation to Problems Experienced inventory (COPE). It was developed by Carver et al.(21) in 1989. The COPE is a multi-dimensional and self-report inventory consists of 60 questions that assess 15 subscales. Each subscale consists of 4 items. The items are rated on a 4-point Likert scale with values specified as 1, 'I never do this;' 2, 'I do this a little bit;' 3, 'I do this moderately;' and 4, 'I do this very often.' The possible values for each subscale range from 4 to 16. The higher scores indicate more use of the relevant strategy. The COPE inventory's Turkish validity and reliability was conducted by Agargun et al.(22). Cronbach's alpha coefficient was calculated as 0.79.

The Mindful Attention and Awareness Scale (MAAS) is a self-report inventory which is planned to evaluate the focused and intentional attention and awareness

Table 1. Descriptive statistics

		n	Mean ± SD	Median (Min. - Max.)
COPE	Positive reinterpretation and growth	128	12.45 ± 2.08	13 (7 - 16)
	Mental Disengagement	128	9.77 ± 2.32	10 (4 - 16)
	Focus on problem / Venting of Emotions	128	11.33 ± 2.57	11 (4 - 16)
	Use of instrumental social support	128	11.7 ± 3.16	12 (4 - 16)
	Active coping	128	11.34 ± 2.43	11 (4 - 17)
	Denial	128	6.91 ± 2.38	7 (4 - 15)
	Religious coping	128	10.8 ± 3.82	11 (4 - 16)
	Humor	128	9.77 ± 3.2	9 (4 - 16)
	Behavioral Disengagement	128	6.91 ± 2.23	7 (4 - 15)
	Restraint Coping	128	9.54 ± 2.01	10 (4 - 14)
	Use of emotional social support	128	11.49 ± 2.98	12 (4 - 16)
	Alcohol-drug use	128	6.73 ± 3.23	5 (4 - 16)
	Acceptance	128	9.88 ± 2.15	10 (4 - 16)
	Suppression of competing activities	128	10.19 ± 2.09	10 (4 - 15)
	Planning	128	12.05 ± 2.44	12 (4 - 16)
PSS		128	27.3 ± 9.48	26 (8 - 52)
MAAS		128	48.95 ± 11.37	50 (19 - 74)

ingredient of mindfulness. Brown and Ryan (23) developed this scale and it was adapted to the Turkish version by Catak (24). The MAAS consists of 15 items and has a 6-point Likert scale with values identified as 1 = almost always, 2 = very frequently, 3 = somewhat frequently, 4 = somewhat infrequently, 5 = very infrequently, and 6 = almost never. The higher scores show greater mindful attention awareness. The Cronbach's alpha coefficient was reported to be 0.82 for the original scale (23), 0.85 for the Turkish adaptation (24).

Additionally, the respondent's demographic information (gender and current year) was recorded. Incomplete questionnaires were excluded to preserve the accuracy of the analysis.

Statistical Analysis
Descriptive statistics for each variable were calculated. Prior to hypothesis testing, data were examined with Shapiro- Wilk test for normality and Levene test for homogeneity of variances as parametric test assumptions. Mann–Whitney U-Test was used to test the difference between gender groups with the data that violates the assumptions associated with parametric distribution whereas the Student's t-Test for Independent Samples is used

with data that meet the assumptions associated with parametric distribution. One-way analysis of variance (ANOVA) was used for data that provide parametric test assumptions to test the difference between classes, whereas Kruskal Wallis test was used for variables that violates the assumptions associated with parametric distribution. Spearman correlation coefficient was used to examine the relationship between variables. $P<0.05$ value was considered statistically significant. Stata 16.1 was used for all statistical analysis.

RESULTS
A total of 128 students out of 169 were participated in the study (overall response rate: 76 %). The demographic data showed a gender distribution of 75 females (58.6%) and 53 males (41.4%). Among the participants, 42.2% (n = 54) was in third, 31.2% (n = 40) was in fourth, and 26.6% (n = 34) was in their fifth year.

Table 1 presents the medians and ranges for the PSS, MAAS and subscales of the COPE inventory. The mean PSS scores for all dental students was 27.3 ± 9.48. The mean MAAS scores for all dental students were 48.95 ± 11.37. The mean scores for

Table 2. Gender distributions of PSS, MAAS and subscales of the COPE inventory

Variables	Gender	n	Mean ± SD	Median (Min. - Max.)	P
Positive reinterpretation and growth	Male	53	11.74 ± 2.16	12 (7 - 16)	0.002 ˣ
	Female	75	12.95 ± 1.88	13 (9 - 16)	
Mental Disengagement	Male	53	9.25 ± 2.41	9 (4 - 15)	0.032 ʸ
	Female	75	10.13 ± 2.19	10 (5 - 16)	
Focus on problem / Venting of Emotions	Male	53	10.32 ± 2.55	11 (4 - 16)	<0.001 ʸ
	Female	75	12.04 ± 2.36	12 (7 - 16)	
Use of instrumental social support	Male	53	10.38 ± 3.46	11 (4 - 16)	<0.001 ˣ
	Female	75	12.64 ± 2.57	13 (4 - 16)	
Active coping	Male	53	10.81 ± 2.49	11 (4 - 15)	0.039 ʸ
	Female	75	11.71 ± 2.33	12 (5 - 17)	
Denial	Male	53	7.19 ± 2.24	7 (4 - 13)	0.135 ˣ
	Female	75	6.72 ± 2.47	6 (4 - 15)	
Religious coping	Male	53	9.38 ± 3.61	9 (4 - 16)	<0.001 ˣ
	Female	75	11.81 ± 3.66	13 (4 - 16)	
Humor	Male	53	10.6 ± 3.08	11 (4 - 16)	0.013 ˣ
	Female	75	9.19 ± 3.17	9 (4 - 16)	
Behavioral Disengagement	Male	53	7.13 ± 2.46	7 (4 - 15)	0.417 ˣ
	Female	75	6.75 ± 2.05	7 (4 - 13)	
Restraint Coping	Male	53	9.43 ± 2.16	9 (4 - 14)	0.56 ˣ
	Female	75	9.61 ± 1.91	10 (5 - 14)	
Use of emotional social support	Male	53	9.98 ± 2.9	10 (4 - 16)	<0.001 ˣ
	Female	75	12.56 ± 2.56	13 (4 - 16)	
Alcohol-drug use	Male	53	7.87 ± 3.3	8 (4 - 16)	<0.001 ˣ
	Female	75	5.93 ± 2.95	4 (4 - 16)	
Acceptance	Male	53	9.51 ± 2.04	10 (4 - 13)	0.146 ˣ
	Female	75	10.13 ± 2.2	10 (4 - 16)	
Suppression of competing activities	Male	53	9.7 ± 2.1	10 (4 - 15)	0.025 ʸ
	Female	75	10.53 ± 2.02	11 (5 - 15)	
Planning	Male	53	11.55 ± 2.61	12 (4 - 16)	0.052 ˣ
	Female	75	12.4 ± 2.27	12 (4 - 16)	
PSS	Male	53	28.04 ± 9.51	28 (11 - 52)	0.439 ˣ
	Female	75	26.77 ± 9.49	25 (8 - 50)	
MAAS	Male	53	47.91 ± 12.5	50 (19 - 74)	0.383 ˣ
	Female	75	49.69 ± 10.52	50 (28 - 69)	
ˣ: Student t test, ʸ: Mann-Whitney *U* test					

Table 3. Comparison of quantitative variables according to year of dental faculty

Variable	Grade	n	Mean ± SD	Median (Min. - Max.)	P
Positive reinterpretation and growth	3	54	12.61 ± 2.29	13 (8 - 16)	0.307 [y]
	4	40	12.12 ± 1.9	12 (7 - 16)	
	5	34	12.56 ± 1.96	13 (8 - 15)	
Mental Disengagement	3	54	9.5 ± 2.24	9 (6 - 16)	0.544 [x]
	4	40	9.95 ± 2.4	10 (4 - 15)	
	5	34	9.97 ± 2.37	10 (5 - 15)	
Focus on problem / Venting of Emotions	3	54	11.02 ± 2.88	11 (4 - 16)	0.335 [x]
	4	40	11.3 ± 2.56	11 (4 - 16)	
	5	34	11.85 ± 1.97	12 (8 - 15)	
Use of instrumental social support	3	54	11.8 ± 3.44	12.5 (4 - 16)	0.515 [y]
	4	40	11.22 ± 3.19	12 (4 - 16)	
	5	34	12.12 ± 2.65	12 (4 - 16)	
Active coping	3	54	11.48 ± 2.52	12 (6 - 16)	0.75 [x]
	4	40	11.1 ± 2.25	11 (4 - 16)	
	5	34	11.38 ± 2.53	12 (5 - 17)	
Denial	3	54	6.94 ± 2.41	7 (4 - 15)	0.804 [x]
	4	40	6.73 ± 2.2	7 (4 - 13)	
	5	34	7.09 ± 2.6	6.5 (4 - 15)	
Religious coping	3	54	10.59 ± 3.8	11 (4 - 16)	0.585 [x]
	4	40	11.32 ± 4.03	12 (4 - 16)	
	5	34	10.53 ± 3.64	11 (4 - 16)	
Humor	3	54	10.09 ± 3.41	10 (4 - 16)	0.6 [x]
	4	40	9.65 ± 3.07	9 (4 - 16)	
	5	34	9.41 ± 3.04	9 (4 - 16)	
Behavioral Disengagement	3	54	6.74 ± 2.26	6.5 (4 - 13)	0.129 [x]
	4	40	6.58 ± 1.93	7 (4 - 11)	
	5	34	7.56 ± 2.43	8 (4 - 15)	
Restraint Coping	3	54	9.5 ± 2.13	10 (5 - 14)	0.093 [x]
	4	40	9.1 ± 1.81	9 (4 - 12)	
	5	34	10.12 ± 1.97	10 (5 - 14)	
Use of emotional social support	3	54	11.24 ± 3.4	12 (4 - 16)	0.465 [x]
	4	40	11.38 ± 2.77	12 (4 - 16)	
	5	34	12.03 ± 2.48	12 (7 - 16)	
Alcohol-drug use	3	54	6.98 ± 3.26	6 (4 - 16)	0.693 [y]
	4	40	6.4 ± 3.14	4.5 (4 - 16)	
	5	34	6.74 ± 3.35	5 (4 - 16)	
Acceptance	3	54	9.56 ± 2.35	10 (4 - 16)	0.354 [x]
	4	40	10.15 ± 2.12	10 (4 - 15)	
	5	34	10.06 ± 1.82	10 (6 - 13)	
Suppression of competing activities	3	54	10.22 ± 2.16	10 (5 - 15)	0.986 [x]
	4	40	10.15 ± 2.23	10 (4 - 15)	
	5	34	10.18 ± 1.85	10.5 (6 - 13)	
Planning	3	54	12.2 ± 2.34	12 (7 - 16)	0.788 [x]
	4	40	11.85 ± 2.48	12 (4 - 16)	
	5	34	12.03 ± 2.61	12 (4 - 16)	
PSS	3	54	25.83 ± 9.36	23.5 (8 - 52)	0.186 [x]
	4	40	27.28 ± 8.36	26.5 (11 - 47)	
	5	34	29.65 ± 10.67	27 (15 - 50)	
MAAS	3	54	48.78 ± 12.01	50.5 (19 - 74)	0.988 [x]
	4	40	49.15 ± 10.81	50 (30 - 65)	
	5	34	49 ± 11.28	46 (20 - 69)	
[x]: one way ANOVA, [y]: Kruskal Wallis test					

Table 4. The correlation coefficients among the PSS, MAAS and COPE inventory sub-dimensions

Variables		PSS	MAAS
Positive reinterpretation and growth	r_s	-0.385	0.385
	p	<0.001	<0.001
Mental Disengagement	r_s	0.032	-0.059
	p	0.716	0.508
Focus on problem / Venting of Emotions	r_s	0.022	0.084
	p	0.803	0.346
Use of instrumental social support	r_s	-0.227	0.233
	p	0.01	0.008
Active coping	r_s	-0.446	0.384
	p	<0.001	<0.001
Denial	r_s	-0.016	-0.096
	p	0.86	0.283
Religious coping	r_s	-0.135	0.11
	p	0.128	0.217
Humor	r_s	0.056	-0.043
	p	0.533	0.629
Behavioral Disengagement	r_s	0.289	-0.245
	p	0.001	0.005
Restraint Coping	r_s	0.08	-0.088
	p	0.372	0.325
Use of emotional social support	r_s	-0.146	0.208
	p	0.1	0.018
Alcohol-drug use	r_s	0.165	-0.233
	p	0.062	0.008
Acceptance	r_s	0.029	-0.035
	p	0.749	0.693
Suppression of competing activities	r_s	-0.135	0.131
	p	0.129	0.142
Planning	r_s	-0.308	0.244
	p	<0.001	0.005
PSS	r_s	1	-0.823
	p	.	<0.001

the COPE subscales were 12.45 ± 2.08 for positive reinterpretation and growth, 9.77 ± 2.32 for mental disengagement, 11.33 ± 2.57 for focus on problem and venting of emotions, 11.7 ± 3.16 for use of instrumental social support, 11.34 ± 2.43 for active coping, 6.91 ± 2.38 for denial, 10.8 ± 3.82 for religious coping, 9.77 ± 3.2 for humor, 6.91 ± 2.23 for behavioral disengagement, 9.54 ± 2.01 for restraint coping, 11.49 ± 2.98 for use of emotional social support, 6.73 ± 3.23 for alcohol-drug use, 9.88 ± 2.15 for acceptance, 10.19 ± 2.09 for suppression of competing activities, and 12.05 ± 2.44 for planning.

Table 2 shows gender distributions of the PSS, MAAS and subscales of the COPE inventory. Female students' average scores of the humor and alcohol-drug use subscales were statistically lower than male students (p <0.05). Comparison of quantitative variables according to year of dental faculty was presented in table 3. No significant difference was found among the mean PSS, MAAS, COPE inventory scores of the third year, fourth year and fifth year grade.

Correlations among the PSS, MAAS and COPE inventory sub-dimensions were shown in table 4. According to the Spearman's correlation coefficient, a negative association was found between the PSS and MAAS (r_s =-0.823, p<0.001). There were negative relationships between the PSS and COPE inventory subscales of positive reinterpretation and growth (r_s = −0.385, p < 0.001); use of instrumental social support (r_s = −0.227, p = 0.01); active coping (r_s = −0.446, p < 0.001); planning (r_s = −0.308, p < 0.001). In contrast, there were positive relationships between PSS and COPE inventory subscale of behavioral disengagement (r_s = 0.289, p = 0.001). There were positive relationships between the MAAS and COPE inventory subscales of positive reinterpretation and growth (r_s = 0.385, p < 0.001); use of instrumental social support (r_s = 0.233, p = 0.008); active coping (r_s = 0.384, p < 0.001); use of emotional social support (r_s = 0.208, p = 0.018); planning (r_s = 0.244, p = 0.005). On the contrary, negative relationships were found between the MAAS and COPE inventory subscales of behavioral disengagement (r_s =-0.245, p = 0.005); alcohol-drug use (r_s =-0.233, p = 0.008).

DISCUSSION

The purpose of the present study was to evaluate the association between mindfulness, perceived stress and coping strategies of undergraduate dental students during the COVID-19 outbreak. The

outcomes showed that there was a significant negative association between the PSS and MAAS, COPE inventory subscales of positive reinterpretation and growth, use of instrumental social support, active coping, planning. A positive relationship was found between the PSS and COPE inventory subscales of behavioral disengagement. To the best of our knowledge, this is the first study to evaluate the relationship between mindfulness, perceived stress and coping strategies of undergraduate dental students.

Perceived stress by dental students is multifactorial and commonly related with the theoretical dental curriculum as well as practical training. In addition, pandemic conditions caused by a novel coronavirus disease affecting the whole world are anticipated to lead to substantial anxiety and stress in dental students. Traumatic events may reduce people's feeling of security and have adverse effects on their mental health. Mishra et al.(25) evaluated the level of perceived stress among dental professionals before and during the COVID -19 pandemic in their study. They stated that a significant increase in the mean PSS score during the outbreak. Chakraborty et al.(26) assessed the dental students' and practitioners' depression levels during the COVID-19. The findings indicated a high level of depression among the majority of dental students and practitioners Apprehensions regarding the professional development owing to reduced clinical practices, previous mental health problems and concern about catching COVID-19 from patients were related to students' higher depression scores. They expressed that finding out the students' and practitioners' depressive symptoms and specifying the related factors could help identify an appropriate psychosocial support.

Consolo et al.(27) investigated dentists' concerns, behavioral responses and emotions following the COVID-19 epidemic. According to their results, the perception of negative effects such as dental practice closure or professional activity reduction were accompanied by fear (42.4%), anxiety (46.4%) and concern (70.2%). In another similar study, Shacham et al.(28) analyzed Israeli dentists' and dental hygienists' psychological distress levels during the COVID-19. The findings revealed that the concern of catching COVID-19 from a patient positively associated with increased psychological distress. Being in a stable relationship and having higher self-

efficacy scores were associated with lower psychological distress.

The present study observed that a significant negative association was found between the PSS and MAAS. In other words, dental students with higher levels of mindfulness had lower levels of perceived stress. In recent years, there has been an increasing attention on mindfulness meditation to improve students' academic performance, well-being and to prepare health profession students to be thoughtful, patient centered and empathic in their practice (29). The psychological well-being of students can be improved by reducing stress and elevating mindfulness, self-efficacy and empathy (30). Including mindfulness training and practice into academic curriculum could foster these competencies. Erogul et al.(31) evaluated whether a mindfulness based stress reduction (MBSR) intervention can enhance 1st-year medical students' resilience, perceived stress and self-compassion. According to their results, the PSS scores showed a significant reduction. Phang et al.(32) examined the efficacy of the MBSR practices in reducing students' perceived stress levels in a medical school in Malaysia. Their study reported that the MBSR intervention is an efficient stress reduction practice for medical student and there was a significant decrease in the PSS score. Similarly, Ratanasiripong et al.(33) investigated the efficacy of mindfulness meditation on levels of perceived stress in nursing students as they started clinical training and they showed that perceived stress levels were significantly decreased by mindfulness meditation. Recent study has also revealed that mindfulness meditation improves nursing students' learning ability and stress management (34).

Coping strategies applied to deal with the unfavorable impacts of stress-filled life events refer to particular behavioral, emotional and cognitive responses (22). According to the current findings revealed that there were positive associations between the MAAS and COPE inventory subscales of active coping; planning; use of instrumental social support; positive reinterpretation and growth and use of emotional social support. Active coping is the process of initiating direct action to try to remove the stress factors or to enhance its unfavorable effects. Thinking about how to deal with a stressor cite to planning. It includes bringing about action strategies and thinking about how best to cope with the problem. Use of instrumental social support is looking for advice,

support or consultation. These three coping strategies are problem-focused coping (21). In contrast a negative relationship was found between the MAAS and COPE inventory subscales of behavioral disengagement in our study. Behavioral disengagement refers to one's reduced effort to deal with the stress factors. It is also identified with helplessness (21). Similarly, a recent research reported that higher mindfulness levels significantly associated with lower levels of stress and maladaptive coping in forensic health care professionals (35). Miller at al. (36) showed that a negative correlation between coping strategy of substance use and mindfulness levels. Palmer and Rodger (37) revealed a significant positive associations between high level of mindfulness and rational coping while a significant negative relationship was found between mindfulness and avoidant coping, perceived stress of university students in their study. Study findings suggest that the high level of mindfulness enhances person's ability to deal with life's stress factors through making easier cognitive, emotional, behavioral flexibility and self-regulation.

Researchers have demonstrated that the different types of stress reduction interventions such as yoga training and motivational videos are beneficial for the dental students in reducing the effect of examination stress (38). It might be suggested that MBSR interventions may provide an effective strategy in reducing perceived stress, enhancing the capacity for self-regulation and increasing dental students' ability to cope with stressors. Hence, we recommend stress awareness lectures or stress management practices in academic curriculum for dental students.

A limitation of this cross-sectional study is that the sample restricted to only one dental faculty dominated by one ethnic group, hence comparative multi-institutional and multi-ethnic studies should be carried out to generalize the findings. Also, this research didn't take into account the differences in the mental distress variables of dental students at different times. Interpretation is a crucial component of any research project. Findings from psychological research might be difficult to interpret in terms of clinical significance. It has been stated that the relationship between a person's mental health status and their ability to function may not be linear (39). Therefore, a psychiatrist's interpretation of the findings may provide a better approach for establishing the significance of psychological

research. Further studies with personal interviews or randomized clinical trials are necessary to evaluate mindfulness-based stress management programs in dental schools and to determine how they can be performed within the academic curriculum.

CONCLUSION

In the current study, dental students with a high level of mindfulness had a low level of perceived stress in the era of COVID-19. In addition, the results suggest that the high level of mindfulness can enhance dental student's ability to cope with stressors. The present study can guide the mindfulness-based stress reduction programs or stress awareness lectures development and implementation within the curriculum of dental education.

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