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Relationship of self-esteem with depression, anxiety, and stress among dental and medical students in Jeddah, Saudi Arabia

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Abstract:

Objectives: The aim of this study was to investigate the prevalence of and relationship between self-esteem and depression, anxiety, and stress among dental and medical students in governmental and private colleges in Saudi Arabia.

Materials and Methods: In this cross-sectional study, 645 clinical and intern dental and medical students in Jeddah, Saudi Arabia, were recruited to assess their self-esteem, depression, anxiety, and stress. A self-reported questionnaire was used that included the 21-item Depression, Anxiety, and Stress Scale (DASS-21) and the Rosenberg self-esteem scale (RSES). Data were analysed using linear regression, t-test, and one-way ANOVA tests run with SPSS Statistics software.

Results: A significant inverse relationship was found between self-esteem and depression, anxiety, and stress. The prevalence of depression was high at 67.4%, anxiety was 79.7%, stress was 64%, and low self-esteem was 23.4%. Depression and stress were the highest among Saudis. Stress was higher among non-married and clinical year students than for married students and interns. Students with higher incomes had lower self-esteem. There was no significant relationship with regards to differences in gender, dental or medical studies, and governmental or private college students.

Conclusion: Low self-esteem is related to depression, anxiety, and stress. Among dental and medical students in Saudi Arabia, there is a high level of psychological distress, and a considerable percentage of students report low self-esteem. More interventional programs are recommended to help boost the self-esteem and psychological well-being of these students.

Key words: Depression, anxiety, stress, self-esteem, dental students, medical students, well-being, Saudi Arabia

Introduction:

Dental and medical education programmes are known to be demanding and long in duration, and students face many types of challenges, including academic pressure, heavy workloads, insomnia, lack of time, and sometimes financial difficulties. All of this can lead to psychological problems such as depression, anxiety, and stress.[1,2] It is important to investigate such psychological problems because many studies have linked dental and medical students' psychological distress to suicide attempts and ideation[3] that may continue into professional life, thus directly affecting the quality of patient care.[4]

Although correlated, depression, anxiety, and stress have different symptoms,[5] and many studies around the world have separately investigated depression, anxiety, and stress among dental and medical students. The prevalence of depression among medical students in different countries has been shown to range from 2.7% to 56.2%,[6,7] and it ranged from 2.8% to 41% among dental students.[8,9] Further, the prevalence of anxiety has varied between 11.5% and 73%[10,11] among medical students and 47-67% among dental students.[6] The prevalence of stress has ranged from 17.6–61.4%[12,13] for medical students and from 70–72% for dental students.[6, 14]

In regards to the studies conducted in Saudi Arabia, the prevalence of depression ranged between 36.4% and 69% among medical students[15-18] and was found to be 69% among dental students.[18] Anxiety ranged from 44% to 68.2%[16-18] among medical students and reached 66.4% for dental students.[18] For stress, the percentages varied from 48.6% to 71.9% for medical students[18-21] and ran at 70.9%[18] among dental students. Nevertheless, none of the Saudi studies investigated the prevalence of these problems in private medical or dental schools. This is in contrast to the international studies, which covered both governmental and private schools.

A meta-analysis study demonstrated that both depression and anxiety have bidirectional relationships with self-esteem.[22] Interestingly, the study showed that the positive effects of self-esteem on depression were greater than the eroding effects of depression on self-esteem. Studies on medical students have shown a significant relationship between low self-esteem and levels of depression[23,24] and anxiety.[25] However, no study has focused on the relationship between stress and self-esteem among medical students.

Similarly, studies done in India have shown a low percentage of medical students with low self-esteem (14.4%).[24] Another study found that female medical students had self-esteem than male students.[26] However, no studies have been done to assess self-esteem among medical students in Saudi Arabia, and no studies have been found to evaluate the impact of self-esteem on depression, anxiety, or stress among dental students.

While some articles have highlighted the importance of timing in studies measuring the psychological status of dental and medical students[27] since psychological health deteriorates somewhat during examination time, few studies have focused on conducting psychological evaluations in those stressful periods.

Thus, the aim of this study was to assess the relationship and impact of self-esteem with regard to depression, anxiety, and stress among dental and medical students in colleges in the western region of Saudi Arabia during final examination. The prevalence of depression, anxiety, stress, and low self-esteem among the targeted population was also assessed.

Materials and Methods:

A cross-sectional study design was used with a convenient sample of dental and medical students in private colleges in Jeddah, Saudi Arabia. The colleges included Batterjee Medical College (private), Alfarabi Dental College (private), Ibn Sina National College for Medical Studies (private), and King Abdulaziz University (governmental). The study included only students in clinical years (fourth, fifth, and sixth years) and interns. Using a precession level of 5%, estimated prevalence level of 50% and confidence level of 95%, 385 participants were required for this study. This study was approved by Umm Al-Qura University institutional review board, and the data collection process was conducted during the month of June 2017, which was during final examinations for the 2017 academic year.

Data was collected through both a hard copy questionnaire and an electronic one. Hard copies were disseminated by the data collector team and class leaders after students' examinations. Participants were asked to return the questionnaire after completion so they could be checked for missing answers. A link to the electronic questionnaire was sent to class leaders to forward to students in their classes. Answers were mandatory for all questions to eliminate the possibility of missing values. The questionnaire was self-administered, and all participants signed a consent form or completed an electronic agreement for the electronic form. Data was collected as a part of a large project to

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assess the psychological health among the Saudi dental and medical students on national level.

The 10-minute questionnaire contained three sections. The first included demographic information such as gender, nationality, marital status, speciality (medicine or dentistry), college type (governmental or private), academic year, monthly family income, and age. The second section was an evaluation of self-esteem measured by the Rosenberg self-esteem scale (RSES).[28] The RSES consists of 10 questions with answers of "0 = strongly disagree," "1 = disagree," "2 = agree," and "3 = strongly agree." Self-esteem is measured as the sum of the scores for all 10 questions, with a range of 0 to 30, where a high score means high self-esteem. Individuals with scores less than 15 are considered to have low self-esteem. The RSES is a validated well-known scale with a Cronbach's alpha of 0.86.

The third section assessed levels of depression, anxiety, and stress using the 21-question Depression, Anxiety, and Stress Scale (DASS-21).[5] The DASS-21 is a set of 21 questions using a seven-question subscale for each of these constructs. Each has a range of answers from 0 to 3, measured as a Likert scale, and each subscale has a sum score that is multiplied by two and ranges from 0 (low subscale distress) to 42 (high subscale distress). Depression, anxiety, and stress can each be classified as normal, mild, moderate, severe, or extremely severe, according to the scale manual. This is also a valid scale, with a Cronbach's alpha of 0.81 to 0.97 for the subscales.

The overall questionnaire was administered in English. Some terms were translated into Arabic for clarification. The participants were informed that the information would be treated confidentially and any identifiable information would be erased. T-test,

ANOVA, and linear regression analyses were conducted on the data using SPSS Statistics software, version 18.0. The margin for statistical significance was $p < 0.05$. Data was kept on a research computer, with access restricted to the research team.

Results:

A total of 645 students participated in the study, with a mean (M) age of 24.14 years and standard deviation (SD) of 1.9. **Table I** shows the demographic information of the participants.

Table I: Students' demographic variables

	Frequency	Percentage
Gender		
Male	213	33
Female	432	67
Nationality		
Saudi	489	75.8
Non-Saudi	156	24.2
Marital status		
Married	117	18.1
Unmarried	528	81.9
Monthly family income		
< 5,000 SR	79	12.2
5,000–15,000 SR	247	38.8
> 15,000 SR	319	49.5
Speciality		
Dentistry	404	62.8
Medicine	240	37.2
College type		
Private college (BMC, Alfarabi, Ibn Sina)	495	76.74
Governmental college	150	23.25
Academic year		
Student	392	60.77
Intern	253	39.22

SR: Saudi riyal

Table II: The prevalence of depression, anxiety, and stress among study participants

	Depression		Anxiety		Stress	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Normal	210	32.60%	131	20.30%	232	36.00%
Mild	95	14.70%	47	7.30%	107	16.60%
Moderate	168	26.00%	168	26.00%	156	24.20%
Severe	65	14.70%	92	14.30%	107	16.60%
Extremely severe	77	11.90%	207	32.10%	43	6.70%

The prevalence of depression was 67.4%, with anxiety at 79.7% and stress at 64% (all ranging from mild to very severe), as illustrated in **Table II**. In addition, the prevalence of low self-esteem was 23.4%.

Using simple linear regression and data in a continuous format, the analysis showed that there was a significant negative relationship between self-esteem and depression (p <0.001, R-squared = 0.083), anxiety, (p <0.001, R-squared = 0.034), and stress (p <0.001, R-squared = 0.024).

The relationship of depression, anxiety, and stress with self-esteem, and their relationship to students' demographic variables, were analysed using t-test, ANOVA, and Tukey post-hoc tests, as shown in **Table III**.

Discussion:

Our study shows there are significant inverse relationships of self-esteem scores to depression, anxiety, and stress individually. This result aligns with previous studies[22-25] that indicate the relationships of self-esteem with depression and anxiety. Further, this study added stress to the analysis. Also, our study adds a specific population, dental and medical students, for this relationship. It is worth noting, however, that our R-squared values indicate that these effects are not relatively strong, and due to the nature of the study, it is hard to determine the direction of each relationship.

The prevalence of depression among both medical and dental students was 67%,

which is higher than all studies conducted outside Saudi Arabia.[6-9] When this result was compared with the Saudi study, we found it was also higher than two previous studies done in Riyadh and Jeddah,[15,17] but very similar to studies done in Qassim[16] and Makkah.[18] The Makkah study with a similar result for depression used the same measurement tool (DASS-21) to assess governmental university students in pre-clinical years, which is in contrast to our study involving four different educational bodies, both governmental and private, and which was conducted among students and interns in clinical years of study. This potentially indicates more evidence of high levels of depression among medical and dental students in Saudi Arabia, especially in the western region of the country. Additionally, in our study, Saudis were found to be more depressed than non-Saudis.

The prevalence of anxiety was 79.7%, which is higher than all previous medical and dental studies, locally and internationally.[6,10,11,16-18] The highest recorded percentage of anxiety among dental and medical students in other studies was 66.4%, using the same tool used in this study.[18] A possible explanation for the difference is that in our study, data was collected during the last month of the academic year, a time that requires student to deliver projects and cases, in addition to taking final examinations. The previous study noted the increased stress at this point in the academic year as well.[29]

Table III: Levels of depression, anxiety, stress, and self-esteem in different demographic variables

		Depression	Anxiety	Stress	Self-esteem
		M (SD)	M (SD)	M (SD)	M (SD)
Overall		14.46 (9.8)	15.08 (9.12)	18.62 (8.88)	18.9 (5.13)
Gender	Male	14.58 (10.08)	14.59 (9.6)	18.34 (9.54)	18.52 (5.48)
	Female	14.4 (9.68)	15.32 (8.89)	18.77 (8.55)	19.09 (4.95)
Nationality	Saudi	14.9 (9.79)*	15.45 (9.05)	19.12 (8.76)*	19.05 (5.17)
	Non-Saudi	13.08 (9.76)	13.92 (9.29)	17.1 (9.13)	18.43 (4.99)
Marital status	Married	13.3 (9.2)	13.47 (8.27)	16.91 (8.58)*	18.57 (4.84)
	Unmarried	14.72 (9.92)	15.44 (9.27)	19.01 (8.91)	18.98 (5.2)
Monthly family income	< 5,000 SR	16.3 (9.42)	15.7 (8.46)	18.63 (8.99)	16.96 (4.35)
	5,000–15,000 SR	14.52 (10.05)	14.98 (9.02)	18.33 (8.94)	18.43 (5.15)
	> 15,000 SR	13.96 (9.68)	15.01 (9.39)	18.86 (8.84)	19.75 (5.14)**
Specialty	Dentistry	14.02 (9.07)	14.72 (8.49)	18.22 (8.58)	18.95 (4.74)
	Medicine	15.2 (10.91)	15.69 (10.1)	19.33 (9.36)	18.82 (5.74)
College type	Private college	14.44 (9.69)	15.34 (8.93)	18.69 (8.89)	18.64 (4.98)
	Governmental college	14.52 (10.2)	14.23 (9.73)	18.43 (8.89)	19.31 (5.35)
Academic year	Clinical year student	14.64 (9.81)	15.49 (9.09)	19.35 (9.23)*	18.78 (4.99)
	Intern	14.18 (9.81)	14.44 (9.16)	17.52 (8.23)	19.32 (5.57)

SR: Saudi riyal

* p <0.05

** Scores for self-esteem in students with monthly family income more than 15,000 SR indicated significantly higher self-esteem than other categories

The prevalence of stress in our study was 64% for both medical and dental students. With regard to medical students, this prevalence is higher than all studies conducted outside Saudi Arabia,[12,13] and it is within the range of Saudi studies, which were between 48.6% and 71.9%.[18-21] For dental students, the prevalence of stress was slightly lower than that found in prior international or local studies.[6,14,18] This was unexpected, as it was believed that stress should be higher during the final examination period. This result is potentially due to the fact that interns and students in clinical years are more experienced in dealing with academic stress than students in the previous study conducted in Makkah.[18] However, our current data cannot provide a solid, reliable explanation for this phenomenon. Furthermore, Saudis, unmarried students, and clinical year students each showed significantly higher levels of stress than did non-Saudis, married students, and interns.

Overall, gender, monthly family income, speciality, and college type were not significantly associated with depression, anxiety or stress. Despite being a contradiction to the majority of prior studies, especially for females who were found to be in poorer psychological health,[6,16] our result is consistent with some studies.[9] It is also noteworthy that differences in psychological stress among some studies are controversial.[6,8] This

might be due to variations in the educational systems of different universities and countries. Another potential explanation is at what point during the academic year a study is conducted. This could play an important role, given the generally high level of psychological burden on students at the end of the academic year. However, such justification lacks support due to the relative lack of studies investigating students at examination time or comparing students from a cross-cultural perspective.

Our results show that around one-fourth students suffer from low self-esteem. This high prevalence is not different between males/females, married/unmarried students, governmental/private students, medical/dental students, or students/interns. These results are higher than the results obtained in the Indian studies, which was 14.4%.[24] Only those students from high-income families were found to have significantly higher self-esteem than others. This result should be approached with interest and concern since future doctors and dentists will be making serious decisions that affect the health and lives of patients.

Because of the apparent high prevalence of depression, anxiety, and stress, in addition to low levels of self-esteem, it is strongly recommended that students be supported with self-development coaching programs on a frequent basis. Such programs have been found to be helpful for students' psychological health,[30] and some may also include sections related to raising self-esteem. In addition, other types of support might be very important during examinations.

This study used data from dental and medical students attending both governmental and private universities and with international validity scales. It is also one of the few studies using data collected during final examinations. However, due to that timing, this project faced many obstacles, including the unwillingness of some participants to fill out the questionnaires due to lack of time and higher levels of psychological burden. This might result in underestimation of the true levels of psychological distress among students, which could be over and above the already high percentages of depression, anxiety, and stress recorded in our results.

Conclusion:

Our results indicate that low self-esteem is associated with increase in depression, anxiety, and stress among dental and medical students in Saudi Arabia. The prevalence of each was found to be high and was higher than that found in other countries around the world. Additionally, about one-fourth of the students tested as having low self-esteem. It is recommended that further studies be conducted to identify the causes leading to these results. These further studies could help to raise awareness and prompt stakeholders in Saudi dental and medical colleges to implement integrated health programs to deal with such problems among their students.

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