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THE ASSOCIATION BETWEEN TOBACCO SMOKING AND STRESS, ANXIETY AND DEPRESSION AMONG MEDICAL STUDENTS AT KING SAUD BIN ABDULAZIZ UNIVERSITY FOR HEALTH SCIENCES, JEDDAH.

Abdulhameed A. Bokhari[1].Mohammed A. Ghaith[2], Qusai S. Qurashi[3], Turki M. Al Fayea[4,5], Abrar N. Fatani[6],

M.D, King Saud bin Abdulaziz University for Health Sciences, Jeddah ,KSA. Email:bokhariab@hotmail.com, mobile :0544384389, [2] M.D, King Saud bin Abdulaziz University for Health Sciences, Jeddah ,KSA., Email:Themag1994@gmail.com, mobile :0544850581. [3] M.D, King Saud bin Abdulaziz University for Health Sciences, Jeddah ,KSA. Email: dr.qusaiqurashi@gmail.com, mobile :0548273210. [4] Department of internal medicine and medical oncology , Royal college of physicians and surgeons ,Canada., [5] Medical Oncologist in, King Abdulaziz medical city Princess Norah Oncology Center ,Jeddah ,KSA. Email: FayaeTM@ngh.md.sa , mobile: 0568559997., [6] M.D, King Abdulaziz University , Jeddah ,KSA. Email: abrar.fatani@live.com, mobile:0505541160.

Abstract:

Contemporary literature suggests that medical school is known as being stressful and may significantly affect students' psychological well-being[10. Additionally relieving stress is one of the main reasons for smoking among college students12. This cross sectional study is aiming to assess the association between tobacco smoking and stress, anxiety, and depression among all medical students of King Saud bin Abdulaziz University for Health Sciences Jeddah, 307 responded. Data was collected through : Depression Anxiety Stress Scale 21quisionnare . Our study demonstrated high levels of stress, anxiety, and depression. Also Female students were more stressed in comparison to male students with a P-value of 0.003. Besides, Female students were more depressed than male students with a P-value of 0.035. Cigarette smoking was found to be associated with a reduced level of depression with a P-value of 0.03.In Conclusion, We recommend workshops to develop better coping skills, as well as counseling about smoke cessation.

Key words: *anxiety, depression ,Stress, smoking, medical students .*

Corresponding author:

Abdulhameed A. Bokhari,

M.D, King Saud bin Abdulaziz University for Health Sciences, Jeddah ,KSA. Email:bokhariab@hotmail.com, mobile :0544384389.

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INTRODUCTION:

It is well-known that Smoking is one of the most intimidating threats the world has encountered. According to World Health Organization [WHO], tobacco smoking kills more than six million people annually. In addition, around 500,000 of those deaths are due to passive smoking. WHO roughly calculated that one in 10 adults dies every six seconds due to tobacco smoking [1.

Smoking is a huge burden based on the current trends. Amazingly, a study from Nepal revealed that 16.8% of the public health students were smokers [3. Medical students are the future health care providers and responsible for the health of society. Therefore, they have an essential role when it comes to smoking [4.

Among medical students, tobacco-smoking rates tend to increase between their first year, which is the year of entry, and last year of medical school [5. And that is a problem because health care providers who smoke send unclear signals to patients whom they have supported to cease smoking [6,[7 and are less likely to provide patients with smoking cessation advice [8,[9.

Medical education is known as being stressful and difficult to learn. According to a study conducted at King Saud University to assess the level of stress among medical students, the total prevalence of stress was 63% and the prevalence of severe stress was 25% among medical students [10. Another study found that the prevalence of Stress among First and Third Year Medical Students at University Kebangsaan Malaysia was 49 % [11.
Bibi Kulsoom and Nasir Ali Afsar conducted a study at Alfaisal University in Riyadh, found a high prevalence of stress, anxiety, and depression among medical students. The levels of stress, anxiety, and depression were 43%, 63%, and 41%, respectively. The percentages were reduced to some extent after examinations to: 30%, 47%, and 30%, respectively [11. All these studies demonstrate the high prevalence of stress and affected mental health among medical students. Also, a research performed at Mekelle University in Northern Ethiopia indicates that relieving stress is one of the main reasons for smoking among college students [13.

To our knowledge, no study has been conducted to assess the extent of tobacco smoking among King Saud bin Abulaziz University for Health Sciences [KSAU-HS], Jeddah medical students. Moreover, this study will detect whether stress, depression and anxiety is associated with tobacco smoking or not.

METHODS:

This is a cross-sectional study, all medical students, males and females, at KSAU-HS, Jeddah from the second year until the last year were invited to participate. All participants were included after an implied and/or verbal informed consent. Students who are diagnosed with psychiatric disorders and currently on medication were excluded from the study. All medical students were administered the Depression Anxiety Stress Scale [DASS-21] questionnaire, which is a well validated international questionnaire that has been used in many studies to assess stress, anxiety and depression. Regarding The questions about smoking patters, they were adopted from the center of disease control and prevention [CDC] to assess the prevalence of cigarettes smoking, shisha, Hookah, and E- cigarettes.
An informed consent was attached to the questionnaire that included the purpose of the study and a confirmation of each participant's and the right to accept or decline contributing to this research. No personal information was collected such as names or students' numbers Since the identity of the students remained undisclosed, no signature of participants was necessary. Rather, filling out the questionnaire and submission by the student himself/herself was considered as a declaration of willingness to participate. The ethical approval was obtained by the Research Committee of King Abdullah International Medical Research Center in Jeddah

Data were analyzed using IBM SPSS Statistics 23 software. Descriptive statistics were used to estimate the prevalence. Chi-square test and One way ANOVA test with A p-value of <0.05 with a 95% confidence interval[CI] and 5% margin of error was considered to be statistically significant. Multivariate regression analysis was used to asses association, and results were expressed as odds ratio [OR] and 95% [CI].

There is no known conflicts of interest , and all authors certifies responsibility .

RESULTS:

All medical students at KSAU-HS, Jeddah who fulfill the inclusion criteria were invited to participate, the total number of students was 479 medical students including Males and females have been invited to participate in the questionnaire. A total of 307 [64%] students participated in our study. Five students were excluded because they were diagnosed with psychiatric disorder and currently on psychiatric medications. Of the 307 participants, 257 [85.1%] were male students and 45 [14.9%] were females.

There were only two female's batches included in the study because college of medicine had opened its female branch recently at KSAU-HS, Jeddah. Moreover, since student admissions had increased over recent years, the most senior batch had the least absolute numbers,

Table *1*].

Table 2]explores the smoking status of the students. Also, it shows the difference between males and females. In our data, males tend to smoke more than females. There was a significant difference regarding smoking cigarettes and hookah with a p- value of 0.01 and 0.02 respectively.

Table 2]

Our study demonstrates that there is high levels of stress, anxiety and depression among Medical Students at KSAU-HS, Jeddah. 48% of students have stress, 54.6% of students have anxiety, and 54.3% of students have some degree of depression. Figure 1]

Moreover, tables 3, 4 and 5 demonstrate the levels of stress, anxiety and depression among medical students and their association with tobacco smoking and gender. Overall, there was an association between gender and stress levels. It was found that female students were more stressed in comparison to male students with a P-value of 0.003 Table 3]In addition to that, depression was found to be associated with gender and cigarette smoking. Female students were more depressed than male students with a P-value of 0.035. And cigarette smoking was found to be associated with a reduced level of depression with a P-value of 0.03.

Variable	Depression		OR [95% CI]	P value
	Normal	Depressed		
Gender 1 male 2 female	125 [48.6%] 13 [28.9%]	132 [51.4%] 32 [71.1%]	2.11[1.05,4.24]	0.035
cigarettes Smokers 1 yes 2 No	32 [61.5%] 106 [42.4%]	20 [38.5%] 144 [57.6%]	1.99[1.07,3.69]	0.03
Shisha Smokers 1 yes 2 No	6 [28.6%] 132 [47%]	15 [71.4%] 149 [53%]	0.362 [.117,1.125]	0.079
Hookah Smokers 1 yes 2 No	26 [44.8%] 112 [45.9%]	32 [55.2%] 132 [54.1%]	1.236 [.590 ,2.590]	0.575
E-Cigarettes Smokers 1 yes 2 No	8 [38.1%] 130 [46.3%]	13 [61.9%] 151 [53.7%]	0.753 [0.272,2.082]	0.584

Table 4]

Table 6] demonstrates stress, anxiety and depression status of each academic year. All batches had many students with high levels of Stress, anxiety and depression, but third year medical students had the highest score according to DASS 21. 56.5% of third year medical students had stress, 58.8% of them had anxiety and 60.3% had depression. However, There was no significant difference between each academic year

Table 7]

The total number of cigarette, e-cigarette, hookah and shisha smokers in each academic level is presented in Table 8:This table shows cigarettes, hookah, shisha, e-cigarettes in medical students in each academic year .

]. After conducting ANOVA test Table 9]there was a significant difference in each academic year regarding cigarettes and hookah smoking with a P-value of 0.026 and 0.02 respectively. And it was noted that the fifth and sixth years had the highest percentage of smoking in comparison to the other academic years.

DISCUSSION:

Our study was the first study in the western region of Saudi Arabia to assess the association between different smoking types and stress, anxiety, and depression among medical students. We found that there is high prevalence of depression, anxiety and stress with prevalence of 48%, 54.6% and 54.3% respectively.

Some previous studies have concluded that female students are more likely to experience depression [15-16. In our study, the logistic regression also suggested that females tends to have a significantly higher depression and stress levels than males, with a P-value of 0.035 and 0.003 respectively.

The prevalence of smoking among medical students at KSAU-HS, Jeddah was 52 students [17.2%] were cigarette smokers, 21 students [7%] were E-cigarettes smokers, 58 students [19.2%] were hookah smokers, and 21 students [7%] were shisha smokers. Also, our study found a difference in smoking patterns between males and females students. There was a significant difference regarding smoking cigarettes and hookah. Males have more tendency to smoke with a p- value of 0.01 and 0.02 respectively.

In addition to that, there was a significant association between cigarettes smoking and lesser depression level. We assume that the reason for this finding is that most of the cigarettes smokers in our study are composed of males, and males are less likely to experience depression. However, a cause–effect relationship cannot be drawn from this study. It requires further exploration in future studies.

In Table 6]we can see that 3rd year medical students high levels of stress, anxiety, and depression and that could be explained by the exposure to the new phase of education. However, when we did the analysis there was no significant difference.

The number of hookah smokers was much high than shisha smoking and significant in our study. We believe that is because the new generation prefers hookah to shisha and thinks it is less harmful. Moreover, the number of e-cigarette smokers was relatively low. We believe it is due to that at the time of the study, e-cigarette smoking was still new and has become trending among the population. We suggest further studies to be done about this topic.

Fifth- and sixth-year medical students were found to have higher rates of smoking in comparison to other academic year. This finding is similar to what we encountered in the literatures review that last year medical students have an increased smoking rate. [5 . It could be due to one method of coping with the great amount of stress, anxiety, and depression they feel in their everyday life. However, exploring the cause was not one of our goals and it is an area for further studies to be conducted.

Limitation:

The college of medicine, female branch is new in the university and only had two academic batches at the time we conducted the study. The majority of students did not provide any descriptive comments about their perceived underlying reasons for their depression, anxiety, or stress

CONCLUSION:

Medical students have high levels of traits of depression, anxiety, and stress. Female students have significantly more stress than males. Being a male gender or cigarettes smoker is associated with a decreased rate of depression traits. We recommend that medical students need workshops on how to develop better coping skills. Furthermore, they need more counseling about smoke cessation.

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Table 1:Number of total genders in all grades with percentages ,and number of total student in each grade with percentages .

Gender	N[%]
Male	257 [85.1%]
Female	45[14.9%]
Grade	N[%]
Second year	81 [29.3%]
Third year	131[43.4%]
Fourth year	38[12.6%]
Fifth year	33 [10.9%]
Sixth year	18 [6%]

Table 2:This table Explores the smoking status:[Cigarettes Smokers, E-cigarette smokers , Hookah Smokers , Shisha Smokers] of medical students. Also, it shows the difference between males and females .

Smoking type	N[%]	Males vs Females	P-value
Cigarettes Smokers	52[17.2%]	Male 50 [19.5%]	0.01
		Female 2 [4.4%]	

E-cigarette Smokers	21 [7%]	Male 20 [7.8%] Female 1 [2.2%]	0.335
Hookah Smokers	58 [19.2%]	Male 55 [21.4%] Female 3 [6.7%]	0.023
Shisha Smokers	21 [7%]	Male 20 [7.8%] Female 1 [2.2%]	0.335

Table 3: Demonstrate the levels of stress among medical students and their association with tobacco smoking and gender.

Variable	Stress		OR [95% CI]	P value
	Normal	stress		
Gender 1 male 2 female	143 [55.6%] 14 [31.1%]	114 [44.4 %] 31 [68.9 %]	2.778 [1.41,5.47]	0.003
cigarettes Smokers 1 yes 2 No	33 [63.5%] 124 [49.6%]	19 [36.5%] 126 [50.4%]	1.568 [0.839,2.928]	0.159
Shisha Smokers 1 yes 2 No	10 [47.6%] 147 [52.3%]	11 [52.4%] 134 [47.7%]	0.580 [0.201 ,1.675]	0.314
Hookah smokers 1 yes 2 No	33 [56.9%] 124 [50.8%]	25 [43.1%] 120 [49.2%]	1.385 [0.660, 2.907]	0.389
E-cigarettes Smokers 1 yes 2 No	11 [52.4%] 146 [52.0%]	10 [47.6%] 135 [48%]	0.895 [0.334,2.398]	0.825

Variable	Depression	OR [95% CI]	P value

Table

	Normal	Depressed		
Gender 1 male 2 female	125 [48.6%] 13 [28.9%]	132 [51.4%] 32 [71.1%]	2.11[1.05,4.24]	0.035
Academic year	Stress	Anxiety	Depression	
cigarettes Smokers 1 yes 2 No	32 [61.5%] 106 [42.4%]	20 [38.5%] 144 [57.6%]	1.99[1.07,3.69]	0.03
Shisha Smokers 1 yes 2 No	6 [28.6%] 132 [47%]	15 [71.4%] 149 [53%]	0.362 [.117,1.125]	0.079
Hookah Smokers 1 yes 2 No	26 [44.8%] 112 [45.9%]	32 [55.2%] 132 [54.1%]	1.236 [.590 ,2.590]	0.575
E-Cigarettes Smokers 1 yes 2 No	8 [38.1%] 130 [46.3%]	13 [61.9%] 151 [53.7%]	0.753 [0.272,2.082]	0.584

4:Demonstrate the levels of depression among medical students and their association with tobacco smoking and gender.

Table 5:Demonstrate the levels of Anxiety among medical students and their association with tobacco smoking and gender.

Variable	Anxiety		OR [95% CI]	P value
	Normal	Anxious		
Gender 1 male 2 female	119 [46.5%] 18 [40.0%]	138 [53.5%] 27 [60.0%]	1.412 [.731,2.725]	0.3
cigarettes Smokers 1 yes 2 No	26 [50.0%] 111 [44.4%]	26 [50.0%] 139 [55.6%]	1.240 [0.661,2.325]	0.502
Shisha Smokers 1 yes 2 No	6 [28.6%] 131 [46.6%]	15 [71.4%] 150 [53.4%]	0.527 [0.171 ,1.627]	0.265
E-cigarettes Smokers 1 yes 2 No	8 [38.1%] 129 [45.9%]	13 [61.9%] 152 [54.1%]	0.872 [0.318,2.395]	0.791
Hookah Smokers 1 yes 2 No	24 [41.4%] 113 [46.3%]	34 [58.6%] 131 [53.7%]	1.207 [.575,2.533]	0.619

Table 6:This table shows stress ,anxiety and depression in medical students in each academic year .

Second year	35[43.2%]	45[55.6%]	41[50.6%]
Third year	74[56.5%]	77[58.8%]	79[60.3%]
Fourth year	15[39,5%]	17[44.7%]	19[50.0%]
Fifth year	13[39.4%]	17[51.5%	15[45.5%]
Sixth year	7[38.9%]	8[44.4%]	9[50.0%]

Table 7:ANOVA test for stress

		Sum of Squares	df	Mean Square	F	Sig.
Stress score	Between Groups	674.077	5	134.815	1.230	.295
	Within Groups	32431.672	296	109.566		
	Total	33105.748	301			
Anxiety score	Between Groups	500.875	5	100.175	1.192	.313
	Within Groups	24879.005	296	84.051		
	Total	25379.881	301			
Depression score	Between Groups	718.429	5	143.686	1.277	.274
	Within Groups	33312.511	296	112.542		
	Total	34030.940	301			

Table 8:This table shows cigarettes, hookah, shisha, e-cigarettes in medical students in each academic year .

Academic year	*Cigarettes*	*Hookah*	*Shisha*	*E-cigarettes*
Second year	12[14.8%]	14[17.3%]	6[7.4%]	6[7.4%]
Third year	17[13.0%]	19[14.5%]	4[3.1%]	7[5.3%]
Fourth year	5[13.2%]	6[15.8%]	3[7.9%]	0[0.0%]
Fifth year	10[30.3%]	12[36.4%]	6[18.2]	5[15.2%]
Sixth year	7[38.9%]	7[38.9]	2[11.1%]	3[16.7%]

Table 9:ANOVA test for smoking.

		Sum of Squares	df	Mean Square	F	Sig.
Cigarettes smokers	Between Groups	1.782	5	.356	2.598	.026
	Within Groups	40.606	296	.137		
	Total	42.387	301			
Current Hookah smoker	Between Groups	2.070	5	.414	2.735	.020
	Within Groups	44.791	296	.151		
	Total	46.861	301			
Current Shisha smoker	Between Groups	.656	5	.131	2.057	.071
	Within Groups	18.883	296	.064		
	Total	19.540	301			
Current E-cigar smoker	Between Groups	.616	5	.123	1.926	.090
	Within Groups	18.924	296	.064		
	Total	19.540	301			

Figure 1

It shows percentage of students affected with stress, anxiety and depression vs not affected in all of the medical students in king Saud bin Abdulaziz university .