

## Prevalence of Cigarette Smoking among Medical Students and it's Association with GAD in Saudi Arabia, 2021

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### ABSTRACT

**Study Design:** Cross sectional

**Background:** Generalized anxiety disorder (GAD) is characterized by excessive and exaggerated anxiety and worry over daily-life events for no apparent reason. People who suffer from GAD are constantly on the lookout for disaster and cannot stop worrying about their health, money, family, work, or school (NIMH, 2016). It often occurs along with other mental health problems, e.g., phobias. panic disorder. post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), depression, and substance abuse, which can make diagnosis and treatment more challenging. Smoking is a damaging habit both physically and psychologically, especially for people with GAD, in which case it can actually exacerbate symptoms of anxiety.

**Methods:** This is a cross-sectional study for which data were collected using a questionnaire comprising multiple-choice questions on the participants' demographic information, their feeling of nervousness and anxiousness, worrying too much about different things, trouble in relaxing, feeling restless, irritability, severe mental disorder, smoking cigarette, frequency of smoking, age at which smoking is started, smoking when feeling stressed, whether smoking helps reducing stress.

**Results:** The participants are students of 18 different universities, both public and private, spread across 11 different regions of Saudi Arabia. Among 370 students approached for the survey, 307 were medical students and the remaining 63 were non-medical students. Almost 25% of total precipitants smoke cigarettes, and about 55% of them started smoking after enrolled to the college of Medicine. The study showed many students use this behavior to reduce stressors which more prone to medical students.

**Conclusion:** To summarize, the present study demonstrated that smoking is unfortunately quite widespread among Saudi Arabian medical students, who will shortly be the leaders and role models in health care; hence, more effective ways to reduce this bad habit are required. More studies need to look for it's relationship with Stresses or anxiety disorders.

**Keywords:** Smoking, Generalized, Anxiety, Disorder, Health

### INTRODUCTION

Generalized, anxiety, disorder (GAD) is characterized by excessive and exaggerated anxiety and worry over daily-life events for no apparent reason. People who suffer from GAD are constantly on the lookout for disaster and cannot stop worrying about their health, money, family, work, or school (NIMH, 2016). It often occurs along with other mental

health problems, e.g., phobias. panic disorder. post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), depression, and substance abuse, which can make diagnosis and treatment more challenging. Smoking is a damaging habit both physically and psychologically, especially for people with GAD, in which case it can actually exacerbate symptoms of anxiety<sup>1</sup>.

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Cigarette smoking is one of the most common risk factors for GAD)<sup>2</sup>. In the United States, roughly 15% of ever-smokers have had at least one anxiety disorder in their lifetime, compared to about 3% of the total population (Mackenzie et al., 2011). Nicotine-dependent smokers had more severe symptoms of GAD than never-smokers, former smokers, and non-dependent smokers<sup>3</sup>. Self-administration of nicotine through smoking might cause anxiety, as dysphoria is one of the observed pharmacologic effects of nicotine. The research by the National Comorbidity Survey Replication confirmed a close association between GAD and smoking behaviors like daily smoking, heavy smoking, and nicotine dependence<sup>4</sup>.

Although smoking is associated with some anxiety disorders, the direction of the association has not been determined. Many previous studies have shown that smoking cigarettes is linked to psychiatric ailments among adolescents and adults in the general<sup>5</sup>. Two kinds of hypotheses were proposed to account for the link between smoking and anxiety disorders. First, anxious individuals are at high risk for smoking initiation due to factors such as peer pressure<sup>6</sup> facilitation of social interaction, and the presumed calming effects of smoking<sup>7</sup>. Research findings that confirm this hypothesis have indicated that adolescents with symptoms of depression or anxiety were at higher risk for smoking initiation than asymptomatic adolescents, that adolescents and young adults with social fears had an increased risk of the onset of nicotine dependence, and that smoking in the presence of a distracting stimulus was associated with reduced anxiety. Second, smoking plays a part in the development of anxiety disorders due to factors such as impaired respiration and the presumed anxiogenic effects of nicotine<sup>8</sup>. In support of this hypothesis, clinical studies have indicated that cigarette smoking preceded the onset of panic attacks among patients with panic disorder.

In the Saudi Arabian context<sup>9</sup>, studied cigarette-smoking habits of students in College of Applied Medical Science, King Saud University, Riyadh, Saudi Arabia, which found that the habit is prevalent among students. The participants were students within the age range of 18 to 26. An experimental design with pre-structured questionnaires and simple random sampling was administered to 712 participants by a panel of experts in behavioral health sciences. Among 647 respondents, 186 (29%) were current smokers, of whom 127 (20%) were male and 59 (9%) were female. The study proposes a joint effort to alleviate the consequences of cigarette smoking among health workers. This effort must embody a multidisciplinary approach that includes legislators, mass media, public education, and health professionals at all levels.

Another study conducted by<sup>10</sup> attempted to estimate the prevalence of smoking and to understand the attitude, practice, and knowledge among medical students in the Medical College of King Abdulaziz University, Jeddah, Saudi Arabia. The cross-sectional study was conducted from September 2009 to May 2010. Out of 643 participants in the study, 90 students (14%) indicated that they smoked tobacco at the time of the study. The prevalence of smoking was higher among male students (24.8%) than among females (9.1%). The study suggests that policymakers have to address the factors contributing to the initiation, continuation, and spread of cigarette smoking.<sup>11</sup> Conducted a cross-sectional study to investigate the prevalence of anxiety and associated factors among pharmacy students in Saudi Arabia, which found that 83 students (49%) have anxiety. Out of the 170 respondents, 30 (17.6%) have reported being smokers. The study also quoted two other studies that have revealed that females and smokers are more likely to report anxiety in comparison to males and nonsmokers.<sup>12</sup> Also reported a strong association between smoking and mental health. Another study reported that increased episodes of anxiety and stress were the main factors that lead to an increased smoking prevalence<sup>13</sup>.

The present study aims to determine the association between initiation of cigarette smoking and GAD among medical students in the Kingdom of Saudi Arabia.

## METHODS

This is a cross-sectional study for which data were collected using a questionnaire comprising multiple-choice questions on the participants' demographic information, their feeling of nervousness and anxiousness, worrying too much about different things, trouble in relaxing, feeling restless, irritability, severe mental disorder, smoking cigarette, frequency of smoking, age at which smoking is started, smoking when feeling stressed, whether smoking helps reducing stress.

The survey was conducted among 307 medical students from 18 universities spread across 11 regions of the Kingdom of Saudi Arabia. Informed consent was obtained from each of the participants. After the collection of data, they were coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies, and percentages were computed), to measure the significance differences chi-square test was used at a 5% level of significance. Ethical approval was obtained from King Khalid University, Saudi Arabia. The study was conducted during the period between July 2021 and December 2021.

## RESULTS

Table 1 demonstrated demographic data like their residence, college, age, education, gender, income, marital status, occupation, and nationality of the 370 students who agreed to participate in the study, of whom 307 have agreed to participate in the study. The participants are students of 18 different universities, both public and private, spread across 11 different regions of Saudi Arabia. Among 370 students approached for the survey, 307 were medical students and the remaining 63 were non-medical students. Almost 70 percent of the students are from Asir region, and the second-highest number of participants are from the Riyadh region (36 or 9.7%). Most of the students (247) are studying at King Khalid University, Abha. Almost all students (96.5%) are aged 27 years or below. Out of 370 students, 357 are single, 10 are married, and 3 are divorced.

**Table 1:** Demographics data

Are you a medical student?		
	Frequency	Percent
Yes	307	83.0
No	63	17.0
Total	370	100.0
Where do you live?		
	Frequency	Percent
Riyadh Region	36	9.7
Makkah Region	23	6.2
Eastern Province	12	3.2
Asir Region	257	69.5
Jizan Region	5	1.4
Medina Region	5	1.4
Qasim Region	1	.3
Tabuk Region	2	.5
Najran Region	18	4.9
Al Bahah Region	10	2.7
Northern Borders Region	1	.3
Total	370	100.0

<b>Colleges</b>		
	Frequency	Percent
King Saud University Prince Sattam bin Abdulaziz University College of Medicine Taibah University	10	2.7
College of Medicine Taif University	2	.5
College of Medicine University of Tabuk	1	.3
Faculty of Medicine Bishah university	2	.5
Jazan university	8	2.2
Najran university	5	1.4
Al-Bahah university	19	5.1
Shaqra university	10	2.7
King Abdulaziz University	2	.5
King Khalid University	15	4.1
Alfaisal University	247	66.8
Umm Al-Qura University College of Medicine	1	.3
King Saud bin Abdulaziz University for Health Sciences	5	1.4
Imam Abdulrahman Bin Faisal University	5	1.4
Princess Nourah Bint Abdulrahman University	1	.3
College of Medicine Al-Imam Muhammad Ibn Saud Islamic University College of Medicine	18	4.8
<b>Total</b>	<b>370</b>	<b>100.0</b>
<b>Age</b>		
Frequency	Percent	
Less than 18	11	3.0
18	13	3.5
19	25	6.8
20	37	10.0
21	53	14.3
22	75	20.3
23	82	22.2
24	34	9.2
25	17	4.6
26	8	2.2
27	2	.5
More than 27	13	3.5
<b>Total</b>	<b>370</b>	<b>100.0</b>
<b>GPA</b>		

Frequency	Percent	
5 – 4	221	59.7
3.99 – 3	116	31.4
2.99 – 2	28	7.6
1.99 – 1	4	1.1
Less than 1	1	.3
<b>Total</b>	<b>370</b>	<b>100.0</b>
<b>Marital status</b>		
Frequency	Percent	
Single	357	96.5
Married	10	2.7
Divorced	3	0.8
<b>Total</b>	<b>370</b>	<b>100.0</b>

Figure 1 shows that more than half of the participants reported that they feel nervous or anxious on many occasions. When asked whether they can stop or control their worries (Figure 2), more than 50 percent said they cannot do so on many occasions, and around 27% said they never can do so. Figure 3 shows a little less than a quarter of the participants said they don't at all feel worried about different things, and more than 40 percent said they feel worried for several days. Figure 4 shows 150 students said they feel trouble while relaxing. Figure 5 shows that almost half of the respondents said they never feel so restless that it is hard to sit still, and around 35 percent have such experience on several days. On being asked whether they easily become annoyed or irritated, half of the students said they feel so on many occasions, just over 10% said they feel so almost every day (Figure 6). Figure 7 demonstrated that a little less than 20 percent of the participants have been diagnosed with a severe mental disorder. Figure 8 shows that among those who were diagnosed with a severe mental disorder, general anxiety and depression are the most common; other disorders diagnosed were social phobia, OCD, panic attacks, etc.

Figure 9 shows that about 75% of the students are non-smokers and a quarter of them are smokers. Then the smokers were asked how many cigarettes they smoke every day (Figure 10), and about 15 of them said they smoke around 20 cigarettes per day, while almost 20 said they smoke 10 cigarettes and another 20 said they smoke five or more cigarettes per day. Figure 11 showed that around 55% of the smoking students developed the habit while studying in college, whereas 10 percent of them started smoking before coming to college. When asked for how long they have been smoking, about 40% said they are smoking for more than two years and about 25% said they started smoking for one year (Figure 12). Figure 13 shows a large majority of students do not try or think of smoking while under stress, but about 120 students try to smoke when they have some stress or anxiety. The last Figure shows that more than half of the students said smoking helped them reduce stress.

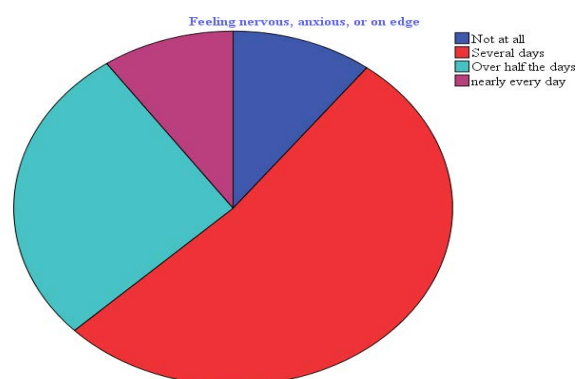
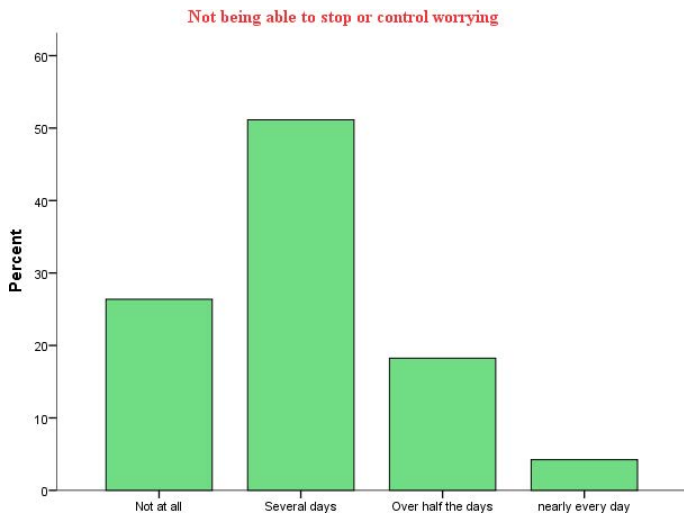
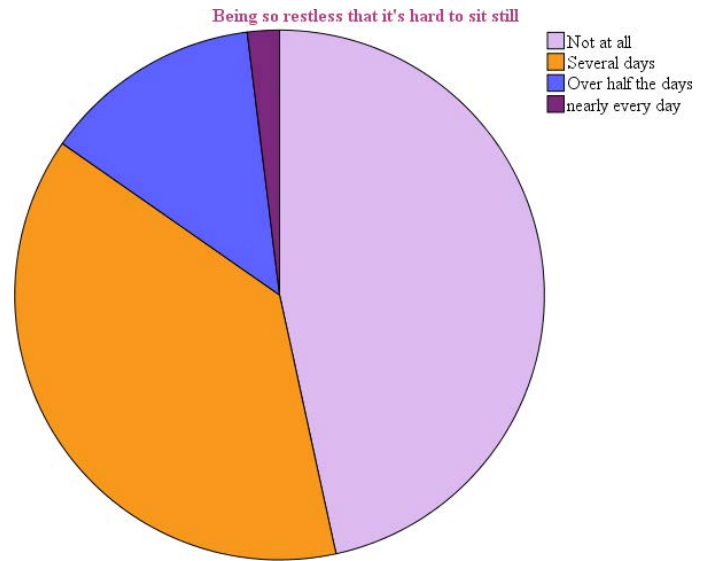


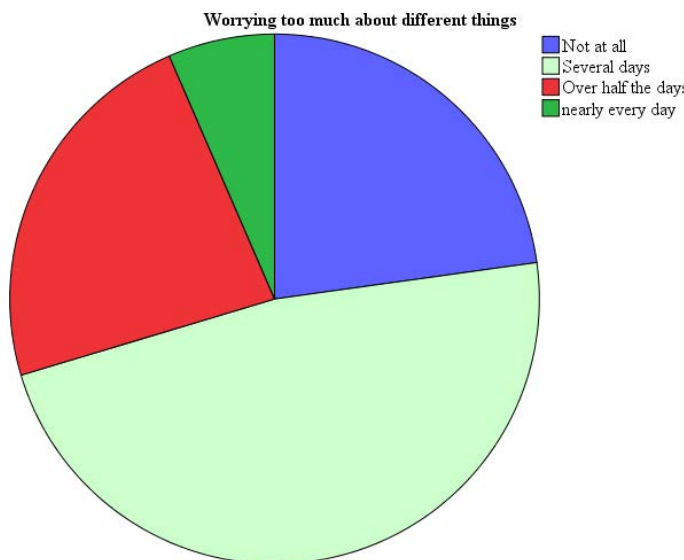
Figure 1: Do you feel nervous, anxious, or on the edge?



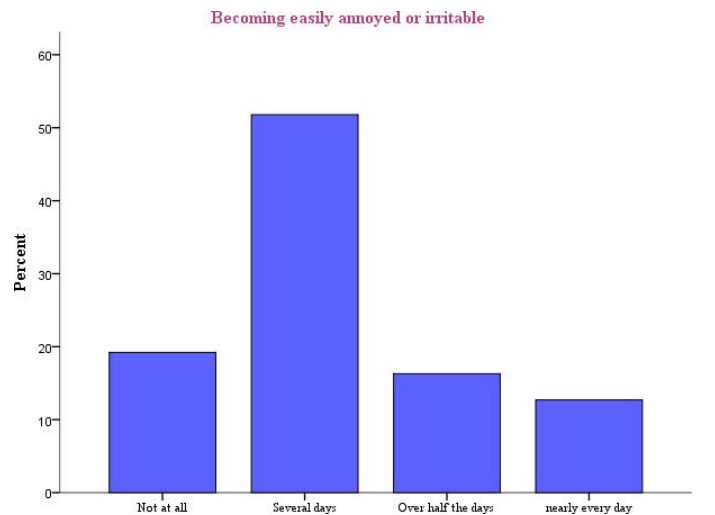
**Figure 2:** Can you stop or control worrying?



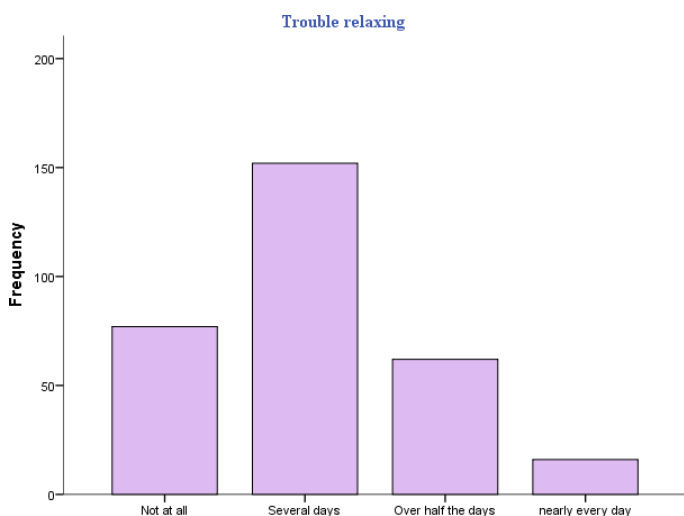
**Figure 5:** Do you feel so restless that it's hard for you to sit still?



**Figure 3:** Do you worry too much about different things?



**Figure 6:** Do you easily become annoyed or irritated?



**Figure 4:** Do you face trouble while relaxing?



**Figure 7:** Have you been diagnosed with a severe mental disorder?

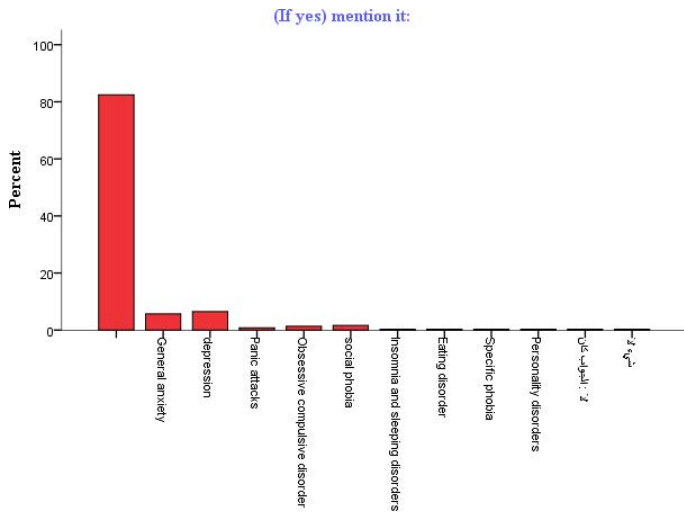


Figure 8: If you are diagnosed with a mental disorder, what is that?

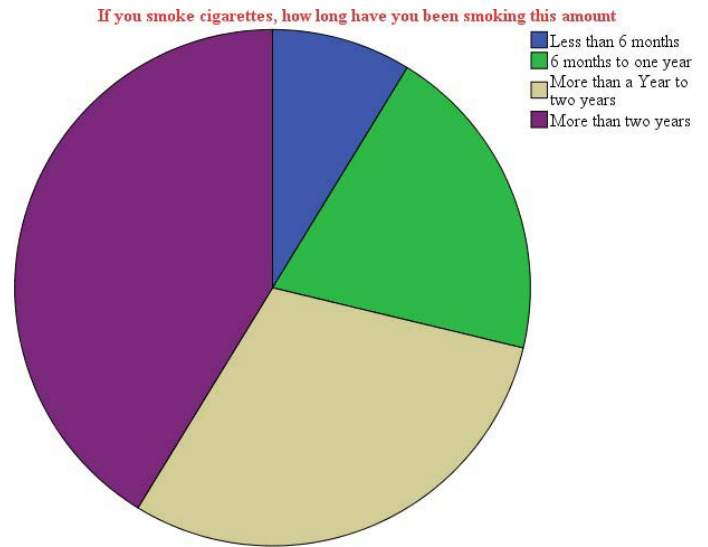


Figure 11: If you smoke, how long have you been smoking?

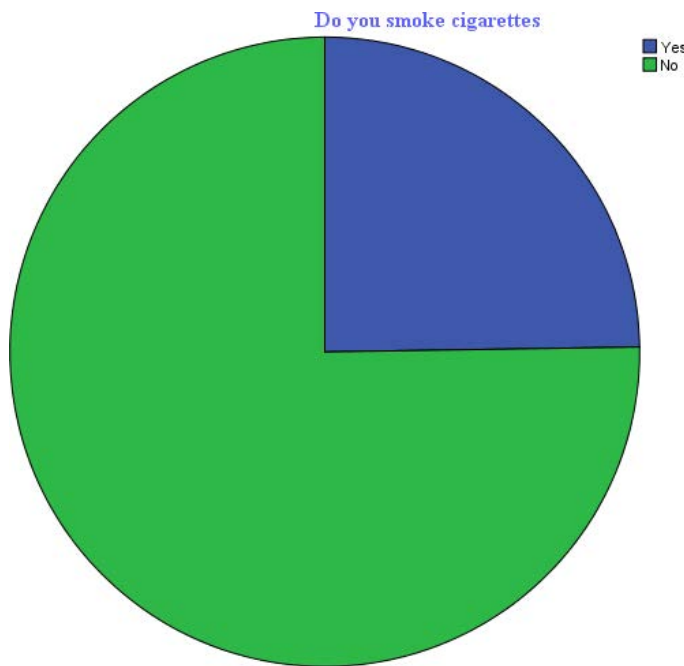


Figure 9: Do you smoke cigarettes?

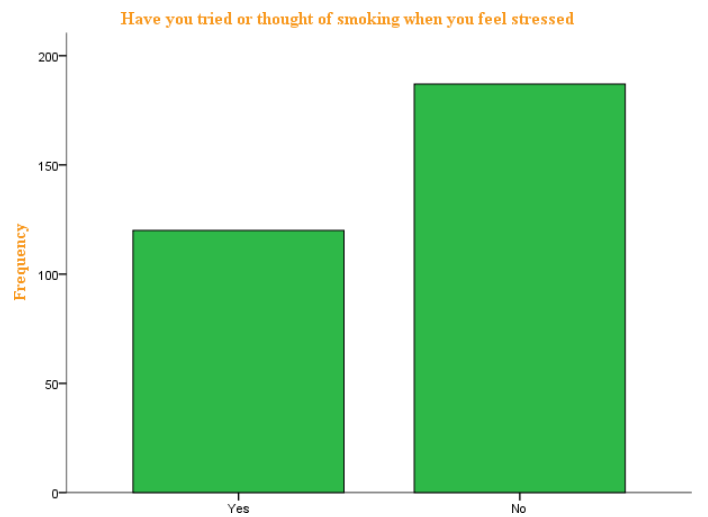


Figure 12: Have you tried or thought of smoking when you feel stressed?

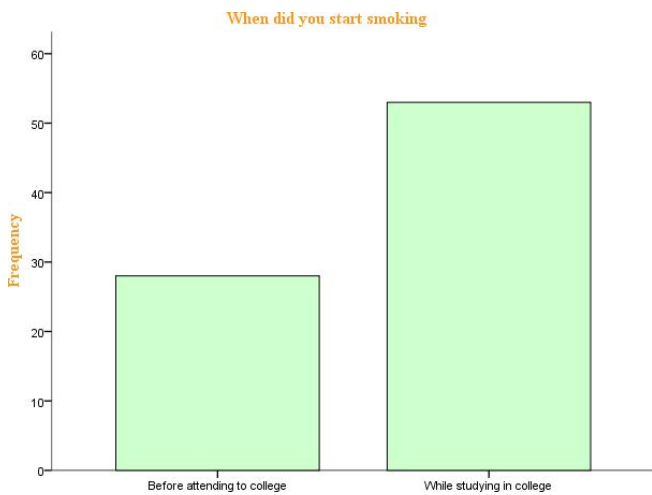


Figure 10: When did you start smoking?

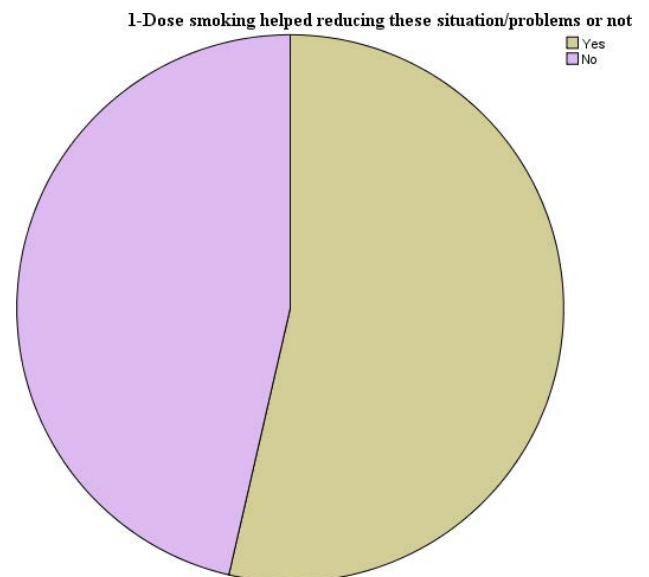


Figure 13: Did smoking help reduce stress or anxiety?

Table 2 makes a comparison between the demographics and cigarette smoking. Among medical students, 76 are smokers, of whom 58 are from the Asir region, again King Khalid University which is located in the Asir region itself has 55 smokers out of 228 total medical students from the university. In terms of gender, out of 76 smoking students, 67 are male and 9 are female cigarette smokers. Out of 76 students who smoke, 56 are in the age group of 21 to 24. Also, fourth- and fifth-year medical students have shown more tendency of smoking (22 and 19, respectively) than early-year students. As for academic performance, 32 smokers have got 4-5 GPA and another 36 have got 3-3.99 GPA. Except one, all the students who smoke are singles.

## DISCUSSION

The study has demonstrated how critical the problem of smoking is and how it is interlinked with mental disorders like GAD among one of the most vulnerable age groups, that is university students. The relevance of the study is increased by the fact that it focuses mainly on medical students, who will soon join the healthcare system and will be expected to fight against this very hazardous habit. The present study has shown a grimmer picture in terms of the percentage of medical students who smoke (24.75%), compared to a previous study<sup>12,13</sup> conducted in Central Saudi Arabia (14%). Another alarming trend found by the

**Table 2:** Comparison between demographics and smoking cigarette

		Do you smoke cigarettes		Total
		Yes	No	
Are you a medical student?	Yes	76	231	307
Total		76	231	307
P value=no statistics calculated				
		Do you smoke cigarettes		Total
		Yes	No	
-Where do you live?	Riyadh Region	6	19	25
	Makkah Region	5	7	12
	Eastern Province	1	4	5
	Asir Region	58	177	235
	Jizan Region	1	1	2
	Medina Region	0	1	1
	Tabuk Region	0	2	2
	Najran Region	5	9	14
	Al Bahah Region	0	10	10
	Northern Borders Region	0	1	1
Total		76	231	307
P value=8.104303				
		Do you smoke cigarettes		Total
		Yes	No	
College	King Saud University	0	5	5
	Prince Sattam bin Abdulaziz University College of Medicine	5	8	13
Taibah University College of Medicine	0	1	1	
Taif University College of Medicine	1	0	1	
University of Tabuk Faculty of Medicine	0	2	2	
Bishah university	3	5	8	
Jazan university	1	1	2	
Najran university	5	9	14	
Al-bahah university	0	10	10	
Shaqra university	1	0	1	
King Abdulaziz University	1	5	6	
King Khalid University	55	173	228	
Umm Al- Qura University College of Medicine	2	1	3	
King Saud bin Abdulaziz University For Health Sciences	1	4	5	
Imam Abdulrahman Bin Faisal University	1	4	5	

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	Princess NourahBint Abdulrahm University College of Medicine	0	1	1
	Northern boarder university Education college	0	1	1
	Total	76	231	307

P value=19.793594

		Do you smoke cigarettes		Total
		Yes	No	
Gender	Male	67	155	222
	Female	9	76	85
	Total	76	231	307

P value=12.6660

		Do you smoke cigarettes		Total
		Yes	No	
Age	18	0	6	6
	19	3	12	15
	20	5	20	25
	21	10	39	49
	22	12	59	71
	23	22	54	76
	24	14	18	32
	25	5	10	15
	26	0	7	7
	27	1	1	2
	More than 27	4	5	9
	Total	76	231	307

P value=17.675814

		Do you smoke cigarettes		Total
		Yes	No	
Academic year	First medical year	2	9	11
	Second medical year	3	25	28
	Third medical year	13	39	52
	Fourth medical year	22	57	79
	Fifth medical year	19	65	84
	Sixth medical year	14	30	44
	Internship	3	6	9
	Total	76	231	307

P value=5.365684

		Do you smoke cigarettes		Total
		Yes	No	
GPA	5 – 4	32	151	183
	3.99 – 3	36	61	97
	2.99 – 2	8	16	24
	1.99 – 1	0	3	3
	Total	76	231	307

P value=15.078914

		Do you smoke cigarettes		Total
		Yes	No	
Marital status	Single	75	222	297
	Married	1	7	8
	Divorced	0	2	2
	Total	76	231	307

P value=1.342451

study is that more than half of the smokers have developed the habit after joining the university. It also finds that male students are more inclined to smoke (30.1%) than female students (10.5%), a finding that corroborates the results of many previous studies<sup>1,10-15</sup>.

As for the correlation between smoking habit and mental disorders, more than half of the participants have reported that they regularly (for several days) feel nervous or anxious. The most common mental disorders are GAD, depression, panic attacks, obsessive-compulsive disorders (OCD), social phobia, panic attacks, etc. About 120 out of 307 medical students have said they tried or thought of smoking when they feel stressed, and more than half of those who tried it, said that smoking helped them control or reduce the stress. It is also found that the students in age group of 21-24, are more inclined toward smoking than their younger and older colleagues.

## CONCLUSION

To summarize, the present study demonstrated that smoking is unfortunately quite widespread among Saudi Arabian medical students, who will shortly be the leaders and role models in health care; hence, more effective ways to reduce this bad habit are required. One shortcoming of the study is that although the focus of the study is the whole of Saudi Arabia, most of the participants are from the southern region of Asir (257 out of 370), and more populous regions like Riyadh and Eastern Province don't have too many representations; therefore, a more comprehensive study is needed to be conducted to get a more reliable and representing picture of the phenomenon. The study also recommends further research on the medical students' perceptions on the association between smoking and mental disorders, as this will help policymakers to better understand and address the prevalence of smoking among youth, especially medical students and professionals.

**Authorship Contribution:** All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

**Potential Conflicts of Interest:** None

**Competing Interest:** None

**Acceptance Date:** 21-09-2023

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