

## Awareness and Attitude toward Smoking E-Cigarettes (Vape) among Smokers in Saudi Arabia 2017

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### ABSTRACT

**Background:** E-cigarettes was described as battery-operated products designed to deliver nicotine. Its use is rapidly increasing worldwide specially among youth owing to marketing and media which play a major important role in making people believe that smoking vape is less harmful than the tobacco cigarettes. However, chemical analysis of e-cigarettes juices has shown that many carcinogens present in cigarette smoke are also found in a range of e-cigarette products. Therefore, this study was conducted to evaluate the awareness and the attitude toward the risk of smoking e-cigarettes vape among smokers in Saudi Arabia.

**Method:** this cross-sectional study involved 1404 individual living in Saudi Arabia. Adult smoker participants involved in this study were in the age range 18-60 years old. A self-administrated web-based questionnaire that include questions about smoking e-cigarettes vape was used to collect data. The collected data were analyzed using SPSS version 22.0.

**Result:** our sample study involved 95% males and 5% females. 68.9% were using e-cigarette, with 58.7% admit to use it daily. 31.1% had never experienced vaping. Those who thought that vaping is absolutely safe represented 13.7% of our sample study. While 67.5% regarded it dangerous.

**Conclusion:** there was a high degree of awareness among Saudis about e-cigarettes and vaping, which highlights the importance of health programmes as well as media targeting youth and the government role toward the Saudis health.

**Keywords:** electronic cigarettes, E-cigarettes, vaping, nicotine, youth, electronic nicotine delivery systems (ENDS), Saudi Arabia

### INTRODUCTION

The Food and Drug Administration (FDA, 2014) described electronic cigarettes or e-cigarettes as battery-operated products designed to deliver nicotine, flavor and other chemicals. Using of these cigarettes is known as Vaping <sup>(1)</sup>. Unlike tobacco cigarettes, e-cigarettes (Vaping) do not burn tobacco. Instead, they turn a flavored liquid into a vapor. Users inhale, or vape, the mist. The liquid usually contains nicotine. That is a highly addictive substance naturally found in tobacco <sup>(2)</sup>. Compared to tobacco cigarettes, they are likely to be safer <sup>(3,4)</sup>, but its use is unsafe and hazardous to human health <sup>(5,6)</sup>. E-cigarettes vaping is rapidly increasing worldwide <sup>(7)</sup> especially among youth, high-income and urban population. Marketing and media play a major role in making people believe that smoking vape is less harmful than tobacco cigarettes and they facilitate to smoking cessation. In addition, e-cigarettes vaping has multiple attractive flavoring options. All these causes make people appealed to use e-cigarettes vaping <sup>(5,8)</sup>. E-cigarettes are highly popular among cigarette smokers who are unable/unwilling to quit, but are willing to switch to putatively less-harmful tobacco substitutes. E-cigarettes are also becoming increasingly popular among youth who have never experimented with combustible cigarettes. However, chemical analyses of e-cigarettes juices (both in liquid form and after being heated into

vapor) have shown that many carcinogens present in cigarette smoke are also found in a range of e-cigarette products. To date, the cancer-causing potential of e-cigarettes has not been investigated in e-cigarettes users (i.e., vapers). Use of e-cigarettes without a prior history of smoking is currently a rare phenomenon in adults, but is increasingly common among youth <sup>(9)</sup>. Because of the marketing and publicity, the awareness about smoking the e-cigarettes vape and their potential competitive advantages to the traditional cigarettes has increased as well <sup>(10)</sup>.

There has been much research conducted to determine the prevalence and to assess the awareness of using the e-cigarettes vaping in the developed countries. In New York City, USA, a study was conducted in 2015, showed that 27% of the participants claimed that they used e-cigarettes every day, while 35% used them because they wanted to quit smoking <sup>(11)</sup>.

In Great Britain, a study conducted in 2014 showed that 20% of the participants were currently using e-cigarettes and 93% of current and recent ex-smokers were aware of e-cigarettes <sup>(12)</sup>. In Ireland, a study was conducted in 2016, showed that 12% of all respondents had tried e-cigarettes and 33% regarded e-cigarettes as safer than conventional cigarettes <sup>(13)</sup>. In Canada, a study was conducted in 2014, showed that 16.1% of the participants reported trying an e-cigarette <sup>(13)</sup>. In

2016, a study was conducted in Egypt, the results showed that 57.5 % of the respondents had heard about e-cigarettes. Among those who know e-cigarettes, 41.6 % believed that e-cigarettes help smoking cessation and 31.9 % believed it is less harmful than traditional cigarettes <sup>(13)</sup>. In Saudi Arabia, to best of our knowledge, this is the first study to be done to assess the awareness and the attitude of the society about the using e-cigarettes vape.

**Rationale**

The prevalence of smoking e-cigarettes is increasing worldwide with poor awareness toward the risks of using it. So, this study aimed to evaluate awareness and attitude toward using e-cigarettes among adult smokers in Saudi Arabia.

**Objective**

This study aimed to evaluate the awareness and the attitude toward smoking e-cigarettes vape among smokers in Saudi Arabia.

**Methodology**

This cross-sectional study involved 1404 individual living in Saudi Arabia. It was conducted from September to December 2017. Adult smoker participants involved in this study were in the age range 18-60 years old and included both genders. An invitation to participate in the survey was distributed widely through e-mail and social

media. A self-administrated web-based questionnaire that included questions about smoking the e-cigarettes (vape) was used to collect data. A consent from the participants was taken. The collected data were analyzed using SPSS version 22.0. The Ethical Approval obtained from the College of Medicine, Taibah University.

**The study was done after approval of ethical board of Taibah university.**

**RESULTS**

Of the 1500 individual enrolled in this study, 1404 were the total respondents. Males were the major participants, as 95% were males and only 5% were females. The study covered the age range from 18 to 60 years old. The response rate in the study was 93.6%. Among respondents, 84.4% were from 18 years to 30's, while 15.6% were above 38 years old. The whole study sample were educated, 1.5% were high school students and 17.5% have finished their high school. University undergraduate students represented 70.8% of the sample study, while 10.3% were postgraduates. Regarding the monthly income of the participants, 39.3% have monthly income ranging from 1,000 to 5,000 SR. Those who had income ranging from 5,000 to less than 20,000 SR represented 50.5% of the whole participants. While, participants having income more than 20,000 SR represented 10.2% of the sample study.

Table 1. Sociodemographic characteristics of the participants

Socio-demographic	Number	Percentage
<b>Gender</b>		
Male	1334	95.0
Female	70	5.0
<b>Age</b>		
18-22	277	19.7
23-27	303	21.6
28-32	347	24.7
33-37	258	18.4
38-45	158	11.3
46-60	61	4.3
<b>Education</b>		
<High school	21	1.5
High School	245	17.5
University	994	70.8
Postgraduate	144	10.3
<b>Income</b>		
1000-5000	552	39.3
5001-<10000	350	24.9
10001-<20000	359	25.6
>20000	143	10.2

Regarding the smoking habits of the participants in our study, 68.9% were vape users, 5.9% used to smoke vape in the past, while 22.6% had never used e-cigarettes. Of the participants, 67.2% have been using e-cigarettes more than 6 months. 81.1% have stopped smoking the tobacco cigarettes, hookah or shisha after switching to vape, while 18.9% still use vape along with the traditional smoking stuff.

Upon asking whether vape or e-cigarette is more satisfying than tobacco cigarettes, hookah or shisha, 48.2% of the participants admitted they got more satisfied with vaping, while 23.6% were less satisfied with the vape. 42.8% of our sample study admitted using less than one reservoir per week, while 32.7% used one reservoir a week, 20.5% said

that they consume two reservoirs per week and 1.6% of our sample study used 3 reservoirs per week, with 2.4% consume more than 3 reservoirs a week.

Participants were asked about the percentage of nicotine in the single cartridge they usually used, 88.1% use low percentage of nicotine (>8mg), while 5.2% admit using high nicotine concentration (>16mg), 3.3% of the sample study use medium concentration of nicotine (8-16mg), and only 3.3% use zero nicotine cartridge.

Taking into consideration the motivation behind using vape, 39.3% said that they used it because they think it's safer than e-cigarettes, while 35.4% used it to quit smoking, 16.3% tried vaping curiosity or for pleasure.

**Table 2 . The smoking habits of the participant in our sample study.**

Smoking	Number	Percentage
<b>Which type do you smoke? (it could be more than one type)</b>		
Tobacco Cigarettes	462	32.9
Hookah	335	23.9
Shisha	104	7.4
Vape	967	68.9
<b>Are you currently smoking vape?</b>		
No, I never used it	317	22.6
No, but I used it in the past	83	5.9
Yes, occasionally (not daily)	180	12.8
Yes, I use it daily	824	58.7
<b>How long have you been using vape?</b>		
less than a month	84	8.4
Over a month	245	24.4
Over than 6 months	295	29.4
Over a year	380	37.8
<b>Do you use vape more during the first few hours after waking up than during the rest of the day?</b>		
During the first few hours after waking up	186	18.5
During the rest of the day	818	81.5
<b>Have you stopped smoking the traditional cigarettes, Hookah or Shisha after switching to vape?</b>		
Yes	814	81.1
No	190	18.9
<b>When compared with regular cigarettes, Hookah, Shisha how much satisfaction do you get from vaping?</b>		
Less	237	23.6
The same	283	28.2
More	484	48.2
<b>How many reservoirs do you consume per week?</b>		
Less than one per week	430	42.8
One per week	328	32.7
Two per week	206	20.5
3 per week	16	1.6
More than 3	24	2.4
<b>What is the percentage of nicotine in a single cartridge that you usually use?</b>		
Zero (0 mg)	34	3.4
Low (<8 mg)	885	88.1
Medium (8-16 mg)	33	3.3
High (>16 mg)	52	5.2
<b>What motivated you to use vape ?</b>		
Safer than electronic cigarettes	395	39.3
Cheaper than cigarettes	34	3.4
Easier to use than cigarettes	56	5.6
Quit smoking	355	35.4
Other (pleasure, curious, etc.)	164	16.3

We have discussed the symptoms noticed upon using e-cigarettes, which include chest pain, breathing difficulty during day and sleeping hours, headache, nausea and coughing during day and night.

**Table 3. Represents the symptoms noticed after vaping among participants.**

Symptoms have been noticed after using vape among 1004 study participants						
Side Effect	Often		Sometimes		Never	
	No	%	No	%	No	%
Headache	11	1.10	169	16.83	824	82.07
Dizziness	10	1.00	187	18.63	807	80.38
Nausea	15	1.49	184	18.33	805	80.18
Sleep Disturbance	11	1.10	98	9.76	895	89.14
Concentration difficulty	8	0.80	75	7.47	921	91.73
Visual disturbance	8	0.80	48	4.78	948	94.42
Trouble with breathing during the day	18	1.79	141	14.04	845	84.16
Trouble with breathing when sleeping	10	1.00	75	7.47	919	91.53
Wheezing	12	1.20	84	8.37	908	90.44
Chest pain	9	0.90	114	11.35	881	87.75
Cough during the day	18	1.79	234	23.31	852	84.86
Cough during the night	11	1.10	75	7.47	918	91.43
Short of breath when hurrying on level ground or walking up a slight hill	41	4.08	211	21.02	752	74.90
Phlegm production	55	5.48	231	23.01	718	71.51

It was found that approximately more than half of the participants had never experienced any of the included side effects. But, 25 of the participants is experiencing breath shortening upon hurrying up. While, 28.5% was experiencing phlegm production. Of the participants, 25% experience were coughing during day, while 9% experience coughing during night.

**Table 4** evaluated the degree of awareness among participants. Our study revealed that 13.7% saw that vaping is absolutely safe, while 56.8%, the majority of our sample study thought that vaping is less dangerous than smoking.

Regarding the effect of vaping on health and whether it might be correlated to some diseases, 16.9% of the whole sample study thought that vaping might cause lung cancer, cardiovascular disorders, cerebral stroke or impotence.

While 32.8% of the respondents saw that vaping is not correlated to any of the above disorders. And half the sample study (50.3%) said they didn't know if there's a correlation between vaping and the mentioned health disorders or not.

70% of the respondents thought that vaping helps in smoking cessation, while 13.4% didn't think vaping might help, and 14.8% of the sample study don't have an idea whether it might help in smoking cessation or not.

Upon asking the participants whether vaping is addictive or not, 55.2% of the sample study admit that it's less than or as addictive as smoking. While 29.1% think vaping isn't addictive.

89.8% of the sample study saw that vaping should be regulated by the government agencies and banned for youth aging less than 21 years old.

**Table 4. Evaluating awareness of the participants**

Characteristics	No (1404)	%
<b>Do you think that vaping is safe for your health?</b>		
Yes, they are absolutely safe	193	13.7
No, but they are less dangerous than cigarettes	797	56.8
No, they are as dangerous as cigarettes	76	5.4
No, they are more dangerous than cigarettes	74	5.3
I don't know	264	18.8
<b>Regarding the effect of vaping on health, Smoking vape can cause/affect the following</b>		
Lung Cancer	134	9.5
Cardiovascular system	74	5.3
Cerebral Stroke	14	1.0
Impotence	15	1.1
None of the above	461	32.8
I don't know	706	50.3
<b>Do you think that Vaping helps in smoking cessation?</b>		
Yes	983	70.0
No	188	13.4
I don't know	208	14.8
<b>Do you think that vape are addictive?</b>		
Yes, as addictive as cigarettes	199	14.2
Yes, but less addictive than cigarettes	576	41.0
No, they are not addictive	408	29.1
I don't know	221	15.7
<b>In your opinion, should vape regulated by government agencies and sold only for customers aging 21 and above?</b>		
Yes	1261	89.8
No	143	10.2

**DISCUSSION**

Our study contributed new insights and understandings of e-cigarettes and the vaping community of Saudi Arabia and evaluated the awareness and attitude toward the risk of using e-cigarettes, which were not reported before among Saudis. Compared to earlier surveys, in our study 93.6% (the vast majority) were the degree of awareness among public toward e-cigarettes, which is close to results of another study done in Malaysia where 95% of their sample study were aware of e-cigarettes<sup>(16)</sup>. On the other hand, our result is much higher than those revealed by an Egyptian study where 57.5 % had heard about e-cigarettes<sup>(15)</sup>. Marketing and advertisement by e-cigarette companies and the Saudis' lifestyle may contribute to the high rate of awareness among our sample study. 58.7% of the participants admitted using e-cigarettes daily, which is much higher than the rate of the daily e-cigarette users in an American study done in 2015 in New York city where 27% was the percentage of vape users who use it on daily basis

<sup>(11)</sup>. This should be taken into consideration and regarded as a serious public health concern as e-cigarette use may delay cessation among current smokers and serve as a dual-use product that maintains smoking habits<sup>(11)</sup>. Our study showed that 35.4% of the e-cigarette users claimed using it to quit smoking, which is similar to results found by **Teddy** in his USA study were 35% of the sample study used e-cigarettes for the same reason<sup>(11)</sup>. In contrast to a study done in Britain in 2014 where 20% of the participants were currently using e-cigarettes<sup>(12)</sup>, 68.9% of our sample study were vape users. Among our participants, 13.7% regarded vaping as a safer way of smoking compared to other conventional smoking ways. This was less than findings of an Ireland study done in 2014 were 33% of the participants regarded it as a safer way of smoking<sup>(13)</sup>. Finally, among our respondents, 70% believed that e-cigarettes help in smoking cessation and 56.8 % believed that e-cigarettes are harmful but still less harmful than traditional cigarettes. Compared to the Egyptian study done in 2016,

where 41.6 % thought that e-cigarettes help quit smoking and 31.9 % believed it is less harmful than the traditional cigarettes <sup>(15)</sup>, our findings were much higher.

## CONCLUSION

In this study, awareness toward using e-cigarette was high among participants. Moreover, gender, was significantly associated with the use of e-cigarettes. Our findings highlight the importance of establishing health programmes and the role of government agencies required to limit of e-cigarette use and to prevent selling it to youth aged less than 18 years old.

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