Awareness, attitude, and practice regarding E-cigarettes among students at King Khalid University, Saudi Arabia

Shehata Farag Shehata (1,2)
Faisal Awadh M Alqahtani (3)
Abdulbari Ahmed Alzahrani (3)
Faris Ahmed Alasmre (3)
Nasser Abdullah N AlGhris (3)
Mohammed Mushabab Al-Mudhi (3)
Ahmed Hussain Almutlaq (3)

(1) Assistant Professor of community medicine, Faculty of medicine, King Khalid University,
(2) Lecturer of Biostatistics, High Institute of Public Health, Alexandria University,
(3) College of Medicine, King Khalid University

Corresponding author:
Shehata Farag Shehata
Assistant Professor of community medicine, Faculty of medicine, King Khalid University
Lecturer of Biostatistics, High Institute of Public Health, Alexandria University
Tel: +966532711294
Email: shehatafarag@yahoo.com

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Abstract

Background: There is a noticed increase in the use of e-cigarettes among adolescents and adults. E-cigarettes, also called nicotine delivery systems, use battery power and heating elements to vaporise a nicotine-containing solution to be inhaled by the user. Hence, e-cigarettes are called vapours due to the inhalation and exhalation of vapours. The nicotine-containing solutions come in various flavours and nicotine content. E-cigarettes are marketed as a safer alternative for smokers to inhale nicotine and as an aid in smoking cessation.

Aim: to assess awareness, attitude, and practice regarding E-cigarettes among students at King Khalid University, Saudi Arabia.

Methodology: A descriptive cross-sectional study was used including 668 students with age range 18 years or more at University of King Khalid, Abha, Saudi Arabia. Data were collected using a pre-designed electronic questionnaire which was initiated by the researchers after intensive literature review and expert's consultation. Questionnaire included student's personal data, awareness regarding E-cigarettes, students' use of E-cigarettes, and source of students' information regarding E-cigarettes.

Results: The study included 668 students who completed the questionnaire at King Khalid University. Exactly 410 (61.4%) students were at non-medical colleges and 258 (38.6%) were from medical colleges. Male respondents were 500 (74.9%). Exactly 659 (98.7%) students had heard about E-cigarettes. Also, 410 (61.4%) students reported that E-cigarettes contain nicotine which is an addictive material. Being addictive, was reported by 417 (62.4%) students and 611 (91.5%) students know that E-cigarettes smoking is harmful. About 70 % of the students reported that they never used E-cigarettes ta all, 11.7% used in the past while 7.2% use it daily. The most reported source was family and friends (53%) followed by social media (51.9%).

Conclusions In conclusion, the current study revealed that half of the students were knowledgeable regarding E-cigarettes and their effect. Also, using E-cigarettes was not high (less than one fifth) especially among young female students.

Key words: E-cigarettes, vapour, smoking, students, awareness, practice, prevalence.

Background

Smoking is one of the most dangerous habits. Some young adults start smoking for a variety of reasons; some of them want to try smoking because their friends and family are smokers and some of them will start smoking because they just think it is cool behaviour. Smoking has been linked to many diseases such as lung, throat, and mouth cancer, and also could increase the risk of cardiovascular diseases, stroke, and diabetes [1-3].

The first successful e-cigarette was made in 2003 in Beijing, China by Chinese pharmacist Hon Lik [4]. E-cigarette is a battery-operated device that is designed to mimic the old cigarette and is used to inhale a usually nicotine-containing vapour. It contains a liquid solution typically consisting of nicotine, various chemical substances (such as propylene glycol or glycerol), and often flavouring [5-7]. After chemical analysis of E-cigarette there is chance of exposure to dangerous and potentially harmful component (HPHCs), including nicotine. Nicotine is considered a very addictive substance and can be hard to stay away from. It's important to mention that some e-cigarettes that claim to be nicotine-free have been found to contain nicotine [8-9].
E-cigarettes have gained a lot of popularity in the past few years among young Saudis; most of them think of it as good alternative and safer than the traditional cigarette. The hype in the media that E-cigarettes are less harmful than traditional cigarettes and help in smoking cessation is one of the important causes in increasing use of the e-cigarette among young people [10, 11].

In the current study, King Khalid University students were targeted to determine the general awareness regarding E-cigarettes and on how much less harmful e-cigarettes were believed to be. Adults were additionally targeted because the 2018 National Youth Tobacco Survey showed that vaping had increased by 78% among high-schoolers and 48% among middle-schoolers, showing that current programs are somewhat ineffective in preventing youth from using e-cigarettes [12].

Methodology

A descriptive cross-sectional study was used including 668 students with age range 18 years or more at university of King Khalid, Abha, Saudi Arabia. Data were collected using a pre-designed electronic questionnaire which was initiated by the researchers after intensive literature review and expert's consultation. A panel of 3 experts reviewed the initial questionnaire for content validity and applicability. Questionnaire included students' personal data including age, gender, and faculty type. Awareness regarding E-cigarettes was assessed by 7 questions covering overall awareness, harm effect, contents, and its use and associated symptoms. The third part covered students' use of E-cigarettes, duration of use, motives and reasons. The last section included source of students' information regarding E-cigarettes. After finalizing the questionnaire, it was uploaded online using social media platforms by the researcher and all colleges at different faculties during the period from February 2020 to May 2020 and the respondents who filled all items were included consecutively till end date of the study

Data analysis
After data was extracted, it was revised, coded and fed into statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was given one-point score and total sum of the discrete scores of the different items was calculated. A participant with a score less than 60% (4 points) of the maximum score was considered to have poor awareness while good awareness was considered if they had a score of 60% (5 points or more) of the maximum. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, E-cigarettes uses in the social circle, besides awareness items practice, and participants' source of information. Cross tabulation was used to assess distribution of awareness according to participants' personal data and source of information. Relations were tested using Pearson chi-square test.

Results

The study included 668 students who completed the questionnaire at King Khalid University. Exactly 410 (61.4%) students were at non-medical colleges and 258 (38.6%) were from medical colleges. Male respondents were 500 (74.9%) and 405 (60.6%) were aged 21 years or more. As for e-cigarette use in participants' social circle, friends were the most reported users (59.4%; 397) followed by that none of the students' circle used E-cigarettes (37.3%; 249) (Table 1).

Table 2 shows awareness of university students regarding E-cigarettes among KKU students. Exactly 659 (98.7%) students had heard about E-cigarettes. Also, 410 (61.4%) students reported that E-cigarettes contain nicotine which is an addictive material. Being addictive, was reported by 417 (62.4%) students and 611 (91.5%) students know that E-cigarettes smoking is harmful. But 279 (41.8%) students reported that E-cigarettes are less dangerous than traditional smoking. Regarding E-cigarette role in smoking cessation, 207 (31%) students said yes and 329 (49.3%) disputed that only traditional smokers use e-cigarettes. Totally, exactly 339 (50.7%) students had good awareness regarding E-cigarettes.

Regarding students practice for E-cigarette use (Table 3), 470 (70.4%) students reported that they never used E-cigarettes at all, 11.7% used them in the past while 7.2% use it daily. As for duration of using E-cigarettes, 45 (37.5%) students used them for 1-5 months while 30 (25%) used them for less than 1 month. As for motivations for using E-cigarettes, being safer than traditional cigarettes was the most reported motivation (37.5%) followed by to help quit

smoking (27.5%), and Easier to use than cigarettes (20%). As for Symptoms you have due to using E-cigarettes, the most reported were shortness of breath (30%), cough (25%), and chest pain (20%).

Regarding source of students' information about E-cigarettes, Figure 1 shows that the most reported source was family and friends (53%) followed by social media (51.9%), mass media (34.6%), and study (10.8%) while 36.2% of the students had a specific source.

Table 4 illustrates distribution of students' awareness level regarding E-cigarettes by their personal data and practice. Exactly 58.5% of older aged students had good awareness level regarding E-cigarettes compared to 38.8% of younger groups with recorded statistical significance (P=.001). Also, 55.8% of male students had good awareness in comparison to 35.7% of females. Exactly 54.9% of students at non-medical colleges had good awareness compared to 44.2% of medical students (P=.007). Good awareness was detected among 66.7% of students who had siblings who used E-cigarettes compared to 42.6% of those who had no-one use E-cigarettes in their social circle (P=.002). Also, 68.6% of those who use E-cigarettes daily had good awareness level in comparison to 47.2% of those who never used them (P=.001). Besides, good awareness was detected among 66.7% of students who gained their information from the study compared to 40.9% who had no source of information (P=.001).

Table 1: Personal data of university students, Abha Saudi Arabia

Personal data	No	%
Age in years		
18-20	263	39.4%
21-26	405	60.6%
Gender		
Male	500	74.9%
Female	168	25.1%
Faculty		
Medical	258	38.6%
Non-medical	410	61.4%
E-cigarette use among your circle		
None	249	37.3%
Friends	397	59.4%
Parents	16	2.4%
Siblings	6	.9%

Table 2. Awareness of university students regarding E-cigarettes, KKU, Saudi Arabia

Awareness items		No	%
Do you hear about e cigarettes?	Yes	659	98.7%
	No	9	1.3%
Psychological effect materials included in E-cigarettes	Nicotine	410	61.4%
	Tar	12	1.8%
	Tobacco	30	4.5%
	Don't know	216	32.3%
E cigarettes can be addictive	Yes	417	62.4%
	No	107	16.0%
	Don't know	144	21.6%
Smoking of E cigarettes is	Harmful	611	91.5%
	Not harmful	36	5.4%
	Don't know	21	3.1%
E-cigarettes are less dangerous than traditional smoking	Yes	216	32.3%
	No	279	41.8%
	Don't know	173	25.9%
E-cigarettes help in smoking cessation?	Yes	207	31.0%
	No	327	49.0%
	Don't know	134	20.1%
Only traditional smokers use e-cigarettes?	Yes	48	7.2%
	No	329	49.3%
	Don't know	291	43.6%
Overall awareness	Poor (0-4)	329	49.3%
	Good (5-7)	339	50.7%

Table 3. KKU students practice regarding E-cigarette use, Saudi Arabia

Practice items		No	%
Do you smoke E-cigarettes?	No, I never used it	470	70.4%
	No, but I used it in the past	78	11.7%
	Yes, occasionally	72	10.8%
	Yes, daily	48	7.2%
How long have you been using E-cigarettes?	< 1 month	30	25.0%
	1-5 months	45	37.5%
	6 month/ more	24	20.0%
	Over a year	21	17.5%
What motivated you to use E-cigarettes?	Safer than traditional cigarettes	45	37.5%
	Cheaper than cigarettes	18	15.0%
	Easier to use than cigarettes	24	20.0%
	Quit smoking	33	27.5%
Symptoms you have due to using E-cigarettes	Cough	30	25.0%
	Chest pain	24	20.0%
	Insomnia	9	7.5%
	Shortness of breath	36	30.0%
	None	72	60.0%

Figure 1. Source of students' information regarding E-cigarettes, KKU, Saudi Arabia

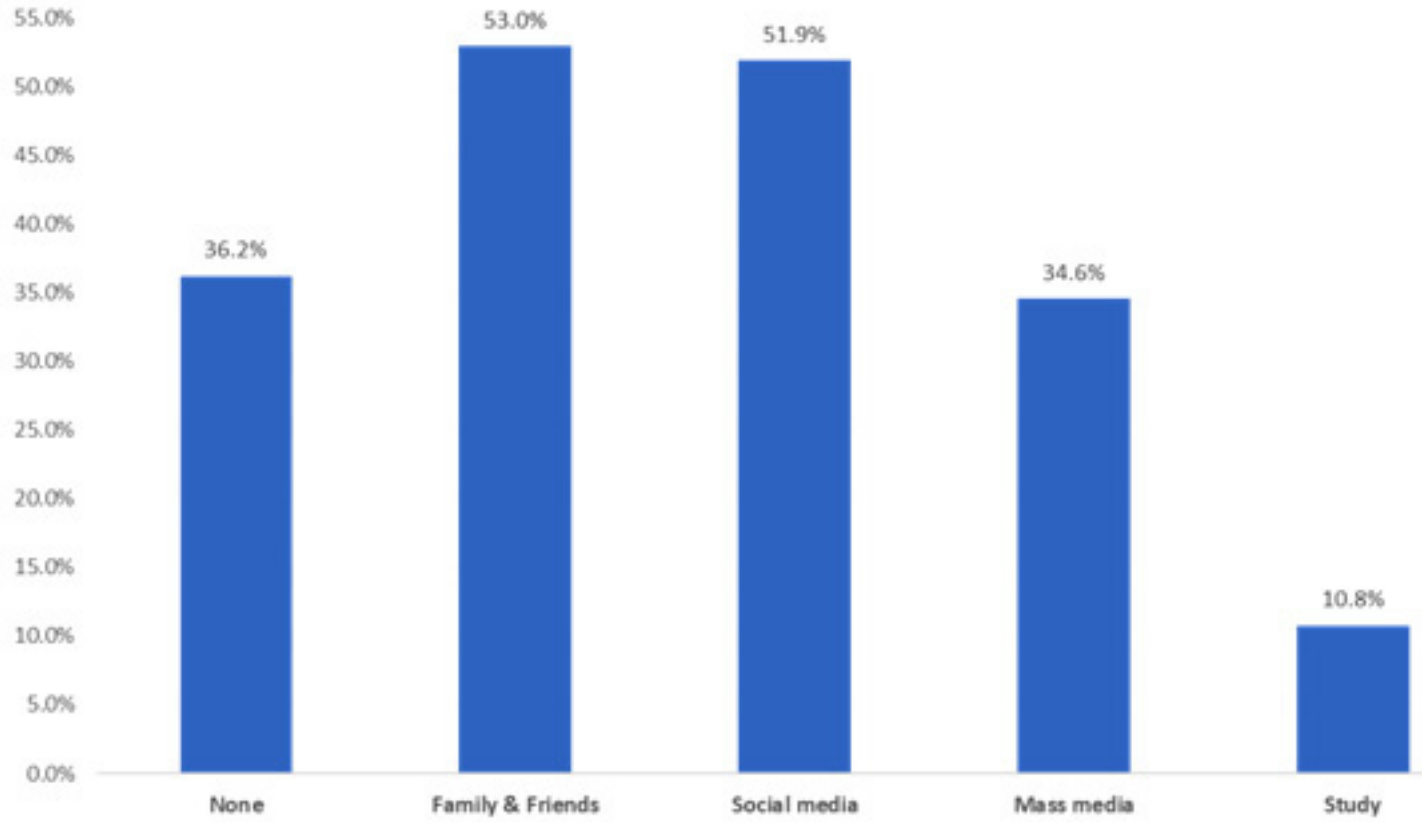

Table 4. Distribution of students' awareness level regarding E-cigarettes by their personal data and practice

Factors		Awareness level				P-value
		Poor		Good		
		No	%	No	%	
Age	18-20	161	61.2%	102	38.8%	.001*
	21-26	168	41.5%	237	58.5%	
Gender	Male	221	44.2%	279	55.8%	.001*
	Female	108	64.3%	60	35.7%	
Faculty	Medical	144	55.8%	114	44.2%	.007*
	Non-medical	185	45.1%	225	54.9%	
E-cigarette use among your circle	Friends	173	43.6%	224	56.4%	.002*
	Parents	11	68.8%	5	31.3%	
	Siblings	2	33.3%	4	66.7%	
	None	143	57.4%	106	42.6%	
Do you smoke E-cigarettes?	No, I never used it	248	52.8%	222	47.2%	.001*
	No, but I used it in the past	42	53.8%	36	46.2%	
	Yes, occasionally	24	33.3%	48	66.7%	
	Yes, daily	15	31.3%	33	68.8%	
Source of information regarding E-cigarettes	Family & Friends	153	43.2%	201	56.8%	.001*
	Mass media	90	39.0%	141	61.0%	
	Social media	173	49.9%	174	50.1%	
	Study	24	33.3%	48	66.7%	
	None	143	59.1%	99	40.9%	

P: Pearson X^2 test;* P < 0.05 (significant)

Discussion

The current study aimed to assess the awareness, attitude, and practice regarding E-cigarettes among King Khalid University students. In spite of an effort to improve adults' awareness regarding the hazards of smoking with a freely accessible Smoking fact sheet from the Centres for Disease Control (CDC), nearly 70% of adults from the survey across the United States were aware of at least one harmful effect of nicotine, with the average number of effects per person being close to three out of the six major effects [13]. Even though CDC has conducted the program Lists from Ex-Smokers since 2012, only 75% of surveyed young adults were aware of programs and resources that were available to them to quit smoking and vaping.

The estimated incidence of yearly global deaths due to smoking is about seven million making smoking and vaping considered as a major public health challenge [14]. Also, there is upward trend regarding the incidence of vaping [15]. Data from the National Youth Tobacco Survey showed that overall use of tobacco products (including non-combustible products) increased by about 40% among United States high school students in 2018 [16]. Also, it was reported that nearly 5 million middle and high school students had used some type of tobacco product in the past month, up from 3.6 million in 2017. This increase was driven entirely by e-cigarette use, as use of other tobacco products fell slightly.

The current study revealed that nearly half of the students were knowledgeable regarding E-cigarettes and their effect. More than two thirds know the nicotine content and its psychological effect while nearly all of them (91.5%) know that it is harmful. But less than half of the students reported that E-cigarettes are less dangerous than traditional smoking. On the other hand, nearly two thirds of them know that it may be addictive. The awareness level regarding E-cigarettes was higher among old, aged students who may have experienced smoking and also among males which is logical due to the male tendency being higher for smoking making them more knowledgeable regarding smoking generally and E-cigarettes in private. Also, higher awareness was recorded among students with friends who used E-cigarettes, and among students who actually used this type of smoking. Students who had their information from their own study and those who had information from mass media also had a good awareness level. The surprising finding was that awareness was higher among non-medical students than medical students. This was not expected as medical students may study about E-cigarettes but this may be explained by that, non-medical students may experience more social relations due to lower study load with many friends and contacts making them at higher probability for exposure to E-cigarettes with friends. Regarding students' practice, the current study revealed that nearly three quarters of the students never used E-cigarettes but also some of them use it daily. The main factors behind using E-cigarettes as reported by the students were their perception regarding being safer and to help them to quit smoking. This was also noticed on awareness regarding safety and its role in quitting smoking. All these findings were consistent with what was reported by Kanyadan V et al who assessed E-cigarette awareness among young adults [17]. The study revealed that about 88.6% of all respondents had heard about E-cigarettes. Nearly 55% of the adults attended schools with tobacco prevention programs. Sixty-four percent of the cohort thought that vaping is safer than traditional cigarettes. Daniluk A et al [18] assessed that the main reason for a recourse to E-cigarettes among adults is a desire to use fashionable technological innovations, and the conviction that such cigarettes are less harmful than the traditional tobacco products. Some respondents used E-cigarettes to quit smoking; others to minimize the harmful effects of smoking. Most respondents acquired information about e-cigarettes from friends or from the internet. There was a high awareness of the chemical composition of substances contained in E-cigarettes. In Malaysia, Adib A et al [19] found that 97% of students know about E-cigarettes and 76% know about nicotine content. Also, two thirds of the students agreed that smoking electronic cigarettes is just like traditional cigarette smoking. In Saudi Arabia, a study was conducted to assess Awareness, knowledge, and perception of electronic cigarettes among undergraduate students in Jazan Region [20]. The study found that 21% of the participants used E-cigarettes which was for quitting smoking among 35.1% of them. The overall knowledge score was 3.9 out of 7. About half of the participants correctly identified e-cigarettes as not less addictive than cigarettes. Though, 70.2% of students failed to classify E-cigarettes as a source of second-hand exposure to nicotine. About two-thirds of the sample believed that e-cigarettes could adversely affect health. A second study was conducted by Qanash S et al to assess Electronic cigarette use among health science students in Saudi Arabia [21]. The study found that E-cigarette (27.7%). Moreover, one-fifth of the E-cigarette users were using them on a regular daily basis. The study found that 42.7% of E-cigarette users have used thm as a tool to quit smoking. Interestingly, more than half (56.7%) of the students who used them to stop smoking had succeeded. However, only 46% of E-cigarettes users who tried to quit vaping have succeeded. Young aged students believed that smoking is more addictive than vaping or recommended E-cigarette for smoking cessation were found to have a higher chance of quitting smoking in the univariate regression analysis.

Conclusions and Recommendation

In conclusion, the current study revealed that half of the students were knowledgeable regarding E-cigarettes and their effect. Also, using E-cigarettes was not high (less than one fifth) especially among young female students. Also, there are irregular users ofE-cigarettes who should be advised and followed to avoid becoming permanent users. Health education programs involving more materials regarding E-cigarettes and their drawbacks should be included in the study curriculum to improve student's awareness and evaluate their attitude regarding

their harmful effect. Also, more taxes should be added roE-cigarettes to be unaffordable for that young age group as some of the students said that their motive for using E-cigarettes was them being cheaper than traditional cigarettes.

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