ORIGINAL ARTICLE

Knowledge and Attitudes Towards Clinical Use of E-Cigarettes Among Medical Students in A Public Sector University of Karachi

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ABSTRACT

Objective: This study aimed to evaluate the knowledge and attitudes of medical students at a public university in Karachi regarding the clinical use of e-cigarettes.
Methodology: A cross-sectional observational study was conducted among the undergraduate MBBS students from first year to final year including both the genders through convenient sampling technique. A self-administered structured questionnaire comprising four sections was administered to the participants.
Results: Total 301 participants were included in the study with a mean age of 22.88±3.951 years. Most of the study participants were females (58.5%) and majority of the participants were studying in their final year (43.2%). It was found that majority of the participants were not smoking any cigarettes (77.7%). Most of the participants (73.4%) had heard about e-cigarettes, but the majority of them denied smoking (n=251, 83.3%). However, of those who smoked e-cigarettes, 52% smoked daily. Further, significantly more female than male participants believed that e-cigarettes are less harmful than conventional cigarettes (P-value = 0.002 Vs. 0.597).
Conclusion: Participants had adequate knowledge about e-cigarettes and slightly positive attitude towards their use. Further, males were found to be more knowledgeable than females in most of the aspects.

Keywords: Attitudes, clinical usage, e-cigarettes, knowledge, medical students

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INTRODUCTION

Electronic cigarette (E-cigarette) also referred to as electronic nicotine delivery systems (ENDS) is a portable device, powered with a battery that delivers nicotine via vaporized, flavourful liquid made from propylene glycol, glycerine, and nicotine[1]. In the last two decades, e cigarette has become increasingly popular as evidenced by a significant increase in its global usage[2]. Its use is more commonly seen in young, high-income city dwellers around the world[3]. Technology innovations, some attractive taste options, and heavy marketing of e-cigarettes as a cheaper and safer alternative of smoking or as a smoking-cessation product, are some of the reasons for its increased use. According to a 2013 report by CDC (Center for Disease Control and Prevention), between 2011 and 2012, e-cigarettes usage in middle and high school students increased from 3.3% to 6.8%[4].

According to Brozek et al., the use of e-cigarettes among medical students is 1.3% with majority of users being male[5]. In a study conducted among medical college students in Saudi Arabia, the results showed that the prevalence rate of e-cigarette use is 11.5%[6]. Although it is perceived beneficial for smoking cessation, there is still inconclusive evidence in support of e-cigarettes' effectiveness in smoking cessation[3]. Moreover, some studies indicated that use of e-cigarettes in student population is not always associated with intention to quit smoking[3, 6].

This growing popularity of e-cigarettes generates increased interest among researchers all over the globe.

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However, little data is available from developing countries and considerable gaps exist in knowledge with regard to the risks and benefits of e-cigarette use, which need to be addressed. It is vital to improve level of awareness and to promote education with regard to e-cigarette use. This could be accomplished at level of college and university students, especially medical students as they are future doctors who would be responsible for imparting adequate knowledge to their patients and encouraging them to develop healthy habits. So, it is vital to know their perspectives on e-cigarettes especially their perspective of clinical use of e-cigarettes as a method to cease smoking.

Thus, this study aimed to assess the knowledge, attitude and perceptions of medical students towards e-smoking, with a special focus on their inclination to recommend the clinical use of e-cigarettes as a method to cease smoking.

METHODOLOGY

IRB/ERC Approval:

This was a cross-sectional observational study conducted at two public sector medical colleges under Dow University of Health Sciences. Before start of the study, the primary researcher obtained ethical approval from University review board via the reference number IRB- 2422/DUHS/approval/2022/748 dated 18th March 2022.

The study was conducted from April 2022 to Dec 2022. Sampling was done through convenient sampling technique from undergraduate MBBS students studying from the first year to the final year including both the genders. However, students not willing to give written informed consent, students of BDS and Allied health sciences, and pass out students and students appearing in exams were excluded from the study.

The sample size was determined using Open Epi version 3.01. In a study from Sindh Pakistan, the perception calculated was 65%[3]. Hence, taking 95% confidence level and 5% margin of error the computed sample size was 298. By adding, 10% for expected non-response rate, a total of 328 was suggested as sample size.

A self-administered structured questionnaire was given to the participants after taking an informed consent. Each participant took approximately 10 minutes to complete the questionnaire. The questionnaire comprised four sections. First section was a brief socio-demographic section including questions like participant's gender, age and study year. Section 2 included questions regarding participants' self-reported smoking status. Section 3 evaluated the knowledge and attitude related to the clinical use of e-cigarettes and e-smoking, and section 4 assessed perception with questions like whether e-cigarettes help in quitting smoking, or are less addictive than regular cigarettes etc.

A pilot project was conducted on 10% of the sample size that is 32 participants to test the questionnaires' clarity, the time required to fill the forms, its organization and applicability. This helped identify and correct any errors or oversights. Based on the feedback, the questionnaire was revised to address the identified deficiencies.

Data was tabulated on Microsoft Excel and analyzed on SPSS (version 22). The categorical variables were shown as frequency and percentages while quantitative variables were presented as means and standard deviation. Further, knowledge and attitude of the participants towards e-cigarettes was assessed using cross tabulation and chi-square test. P-value below 0.05 was considered significant.

RESULTS

Total 301 participants were included in the study with a mean age of 22.88±3.951 years. Most of the study participants were females (58.5%) while the majority of the participants were studying in their final year (43.2%), were Pakistani (93.7%), and studying in a private sector university (70.8%). Most of the participants were not smoking conventional cigarettes (77.7%), even in the past (73.4%). Further, when participants who smoked cigarettes were asked about the number of cigarettes they smoked daily, 8.3% said two packs of cigarettes. Moreover, when they were asked if they wanted to quit smoking, 22.6% said yes (Table 1).

Most of the participants (73.4%) agreed that they have heard about e-cigarettes. Additionally, when they were asked about their source of information, almost half of them reported having heard about e-cigarettes from their family and friends (50.5%) (Figure 1).

When participants were asked if they smoked e-cigarettes, majority of them denied it (n=251, 83.3%), however, of those who admitted smoking e-cigarettes, 52% smoked daily, 12 did it occasionally (24%), while all others reported smoking rarely (n=12, 24%). Additionally, most of those who smoked, cited fashion or trend as their reason of starting using e-cigarettes (n=21, 42%) (Figure 2).

Additionally, when knowledge and attitude of the participants was assessed towards the clinical use of e-cigarettes, significantly more female participants than males claimed that e-cigarettes were less harmful than conventional cigarettes (P-value = 0.002 Vs. 0.597).

Table 1: General characteristics of the participants (n=301)

General Characteristics		N	%
Age (Years)	Mean ± SD	22.88±3.951	
Gender	Male	125	41.5
	Female	176	58.5
Study Year	First	24	8.0
	Second	18	6.0
	Third	38	12.6
	Fourth	91	30.2
	Final	130	43.2
University Sector	Private	213	70.8
	Public	88	29.2
Nationality	Pakistani	282	93.7
	Others (USA, America, Canada, Iran, etc.)	19	6.3
Do you currently smoke regular cigarettes?	Daily	24	8.3
	less than daily	42	14.0
	not at all	234	77.7
In the past, have you ever smoked regular cigarettes?	daily	31	10.3
	less than daily	49	16.3
	not at all	221	73.4
Packs of cigarette smoked daily (n=99)	0	52	52.5
	1	19	19.1
	2	25	25.2
	3	3	3.03
Have you ever thought about quitting smoking? (n=99)	yes	68	68.6
	no	31	31.4

Table 2: Knowledge and attitude of the participants towards the clinical use of e- cigarettes

Knowledge and Attitude		N	%	P-value
E-cigarettes are less dangerous and a safer option than traditional cigarettes? (n=235)	Yes	101	33.6	**0.000**
	No	63	20.9	
	Not sure	71	23.6	
	Yes	42	14.0	
E-cigarettes are not at all harmful? (n=238)	No	129	42.9	**0.000**
	Not sure	67	22.3	
E-cigarettes help in quitting smoking? (n=236)	Yes	86	28.6	**0.000**
	No	75	24.9	
	Not sure	75	24.9	
When compared to regular cigarettes, e-cigarettes reduce the risk of cancer for users? (n=235)	Yes	82	27.2	**0.000**
	No	78	25.9	
	Not sure	75	24.9	
E-cigarettes are addictive? (n=236)	Yes	179	59.5	**0.030**
	No	14	4.7	
	Not sure	43	14.3	
FDA approval of e-cigarettes for smoking cessation? (n=236)	Yes	yes	44	**0.000**
	No	no	60	
	Not sure	Not sure	132	
Are students adequately educated regarding e-cigarettes in medical school? (n=236)	Yes	68	22.6	**0.001**
	No	168	55.8	
Is it essential for doctors to be educated about e-cigarettes? (n=236)	Yes	200	66.4	**0.000**
	No	14	4.7	
	Not sure	22	7.3	
Would you suggest e-cigarettes as a method of smoking cessation to a patient who smokes cigarettes? (n=235)	Yes	88	29.2	**0.000**
	No	82	27.2	
	Not sure	65	21.6	

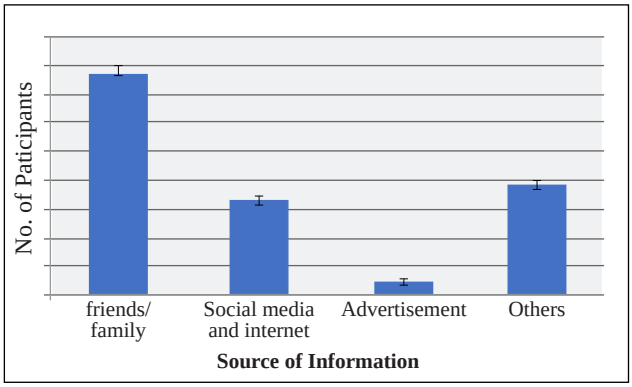

Figure 1: Source of Information of the Participants about E-cigarettes

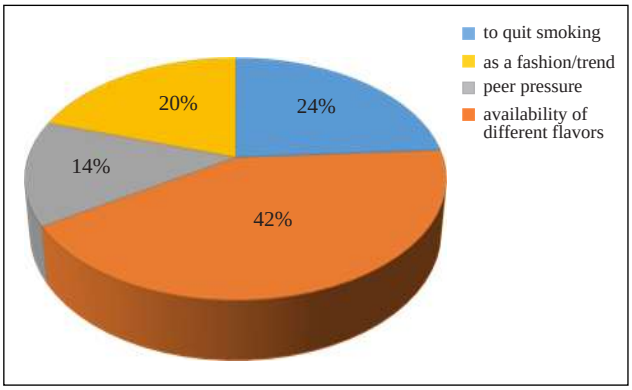

Figure 2: Reported Reasons of Starting Electronic Cigarettes

Furthermore, 27.2% participants believed that e-cigarettes reduce the risk of cancer for individuals who use them as an alternative to smoking conventional cigarettes. More than half of the participants (59.5%) agreed that e-cigarettes are addictive. When participants were asked whether they would recommend e-cigarettes as a method to quit smoking, 29.2% participants said that they would. (Table 2).

DISCUSSION

Healthcare practitioners consider e-cigarettes as a measure of harm reduction and discuss about the efficacy and safety of these e-cigarettes in cessation of smoking. Previously published research regarding the use of e-cigarettes for smoking cessation have shown significant variation and ranged from 3.7 to 46% in clinical practice[7,8]. Whereas another study reported that healthcare professionals have highlighted less harmful effects of vaporized and e-cigarettes as compared to conventional cigarettes and have favorable attitudes towards the use of e-cigarettes[9]. Therefore, it is really crucial to highlight the long-term health related consequences of e-cigarettes usage.

In the current study, the majority of participants denied smoking (n=251, 83.3%). Similarly, a study conducted in Jordan revealed that out of total 679 participants, only 38 were e-cigarette users[10].

Further, the current study reported that males were commonly using e-cigarettes and their source of information regarding e-cigarettes was family or friends followed by social media. Likewise, e-cigarette use was very high among males in another study however, the primary source of their information was social media[10].

Most smokers in our study had taken up e-smoking as a fashion or trend (n=21, 42%), followed by as a smoking cessation method (24%), and due to the availability of different flavors (20%). This availability of different appealing flavors has led to calls for flavor ban from all ENDS by the American Academy of Pediatrics (AAP) and the American College of Physicians (ACP)[8].

Current study agreed with another study conducted in Jordan in 2022 which also concluded that majority of the participants had adequate knowledge overall and positive attitude towards the use of e-cigarettes[11].

Most of the participants in our study believed that e-cigarettes were significantly less dangerous than conventional cigarettes (55.4%), and females were found to be more knowledgeable as compared to males (P-value = 0.002 Vs. 0.597). However, males were found to be more active users of e-cigarettes than females. Another study reported significant gender differences, where females were found more prone to the idea than males[12]. These findings suggest increasing popularity of e-cigarettes among the youth especially the medical students, urging towards the need of strict regulations and more educational and awareness campaigns to provide knowledge about the harmful effects and addiction of nicotine.

Another study assessed participants' perceptions of nicotine pouches and e-cigarettes. Most participants viewed nicotine pouches as the most effective method for quitting smoking, while e-cigarettes were perceived as less harmful than nicotine pouches[13]. Further, a Chinese study showed that male gender, low education level, and lifestyle habits, all contribute towards the use of smoking including both conventional and electronic cigarettes[14,15].

Another study conducted in Italy showed contrasting results where the use of e-cigarettes was found to be rare among the nursing students and it was found that use of e-cigarette was not associated with smoking cessation[16]. Similarly, another study conducted in Jordan showed less popularity of e-cigarettes as compared to other countries. Further, medical students showed better knowledge regarding e-cigarettes compared to non-medical students (OR = 1.710, 95CI% =1.326–2.204, p-value <0.001)[17].

In contrast, another study conducted in Jordan showed that more than one fifth of adults were engaged in e-cigarette smoking[18]. Whereas, a study conducted at a medical university in the United States showed lack of knowledge among medical students regarding tobacco products and increased number of students consuming these products[19]. Additionally, a study conducted in Thailand showed misconceptions of medical students in several aspects regarding the use of e-cigarettes, where lack of information in the curriculum concerning the smoking cessation method, addiction, and health impacts was not sufficient[20].

Another study conducted in Karachi reported findings that contrasted with the present study, as participants demonstrated a negative attitude toward the use of e-cigarettes. This may be attributed to social and cultural stigmatization, as well as limited exposure to e-cigarette advertising on social media[21]. Furthermore, another study indicates that although the use of e-cigarettes among adolescents is increasing, their knowledge regarding these products remains inadequate[22].

In conclusion, the present study found that participants had adequate knowledge of e-cigarettes and a slightly positive attitude toward their clinical use. However, the lack of robust evidence regarding the safety and efficacy of e-cigarettes in comparison with conventional cigarettes, as well as their long-term health consequences, remains debatable. Therefore, standardized survey methods, along with continuous monitoring at both national and international levels, are required to track the evolving patterns of e-cigarette utilization. Furthermore, head-to-head randomized controlled trials are needed to compare the effectiveness of e-cigarettes for smoking cessation with standard therapies. Such evidence would be instrumental in informing public health policies and guiding patient counseling and advocacy.

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