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## Knowledge, Awareness and Perceived Harm of Vaping among Dental Students in Karad City – A Questionnaire Survey

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### ABSTRACT

In an era dominated by stress and competition, the pursuit of mental stability among young adults, particularly in the medical field, has led to the adoption of alternative practices with potential health repercussions. This study delves into the realm of dental students' knowledge, awareness, and perceived harm of vaping in Karad city, shedding light on a phenomenon that has become increasingly prevalent within the dental community. The introduction of e-cigarettes, colloquially known as "vapes," has presented itself as a seemingly less harmful alternative to conventional smoking. This study, conducted at the School of Dental Sciences, Krishna Vishwa Vidyapeeth, Karad, aims to unravel the intricate tapestry of attitudes and beliefs surrounding e-cigarettes among dental students. The cross-sectional study involved 304 dental students, both undergraduates and postgraduates, with a mean age of 24.6. A substantial majority (55.3%) reported never having smoked, and 60.6% had no history of e-cigarette use. However, a notable 26.5% identified as smokers, while 39.4% had experimented with e-cigarettes, with 23.3% currently using them. Despite engaging in vaping, dental students exhibited less favorable attitudes toward e-cigarettes, indicating a potential gap in understanding. The study brings attention to the urgent need for enhanced education among health professionals, specifically dental students, regarding the design, chemical content, and health effects of e-cigarettes. The discrepancy between perceived harm and actual knowledge underscores the importance of clear guidelines to regulate vaping behavior. This research contributes to the existing body of knowledge by providing specific insights into the awareness and attitudes of dental students in Karad city, a geographical area where such studies are notably scarce. The findings advocate for targeted educational interventions, emphasizing the potential risks associated with vaping, to promote informed decision-making among dental professionals and pave the way for a healthier future.

**Keywords.** Vaping, E-cigarettes, Dental students, Knowledge, Awareness, Perceived harm, Oral health, Psychoactive products, Smoking alternatives, Health professionals, Cross-sectional study, Karad city, School of Dental Sciences, Nicotine addiction, Educational interventions.

### I. Introduction:

In the dynamic landscape of contemporary life, characterized by incessant competition, mounting work pressures, and pervasive stress, the search for solace and mental stability has become a paramount concern for young adults, particularly those within the medical fraternity. This includes the dedicated individuals pursuing a career in dentistry. As a consequence of the perpetual challenges these young dental students and professionals face, there is a palpable yearning for mental peace, often leading to the adoption of practices that provide temporary relief but carry detrimental effects on the human body. However, in the wake of increasing awareness, newer technologies have emerged as alternatives to conventional smoking, one of which is the

electronic cigarette, commonly known as "e-cigarettes" or "vapes." The inception of e-cigarettes dates back to 2003 when the first vape was manufactured by Hon Lik in China. Since then, it has gradually evolved into an integral part of people's daily routines, gaining popularity as a psychoactive product, particularly among health professionals and dental students. The appeal of e-cigarettes lies in their perceived lesser harm compared to traditional smoking. These devices, readily available over-the-counter, offer an alternative to conventional tobacco smoking, presenting a seemingly safer option for those seeking a nicotine fix. Dental professionals, as integral members of the healthcare community, play a pivotal role in advocating tobacco abstinence and providing counseling services. However, the increasing prevalence of e-cigarette use among dental students raises questions about their knowledge, awareness, and perceptions regarding these devices. This study aims to delve into the intricate web of attitudes and beliefs surrounding e-cigarettes among dental students, specifically those in the School of Dental Sciences at Krishna Vishwa Vidyapeeth in Karad, located in the Satara district.

The knowledge level of dental students regarding vaping is a critical aspect that influences their perception and behavior towards e-cigarettes. Numerous studies have illuminated the inadequacy of knowledge among students concerning the design, chemical content, potential health effects, and regulation of e-cigarettes. Notably, a study conducted among undergraduate students in Manila revealed that a staggering 96.1% of students exhibited poor knowledge in these areas. Similarly, another study found that more than half of the participants were unaware that some e-cigarettes contain nicotine. These findings underscore the pressing need for enhanced education and awareness initiatives regarding vaping among dental students.

While existing studies have explored awareness, perceived harm, and knowledge of dental students toward vaping, the current research brings a novel perspective by focusing specifically on dental students residing in Karad city. E-cigarettes, electronic devices that simulate tobacco smoking by producing vapor, have a composition varying in propylene glycol, glycerin, nicotine, and flavorings. Nicotine, a highly addictive substance, contributes to the physical and psychological dependence associated with e-cigarette use, providing almost instantaneous stress relief.

The market penetration of e-cigarettes has witnessed a rapid surge since their introduction in 2003. In 2011, approximately 7 million adults globally were using e-cigarettes, a number that skyrocketed to 68 million in 2020, contrasting with 1.1 billion cigarette smokers. Further escalation led to 82 million e-cigarette users in 2021. This surge is attributed to targeted marketing, the cost-effectiveness of e-cigarettes compared to traditional cigarettes, and the perceived safety profile of e-cigarettes. Notably, the ban on e-cigarettes in India since 2019 has not deterred their accessibility to a wide population through illicit means, altering chemical compositions to appeal to inexperienced users.

The consequences of vaping extend beyond the individual, impacting oral health significantly. The aerosol produced by e-cigarettes contains harmful chemicals, including nicotine, formaldehyde, and acrolein, with adverse effects on oral health such as dry mouth, gum inflammation, and an elevated risk of oral diseases like periodontitis. Additionally, the act of vaping itself contributes to dental problems, inducing dry mouth by reducing saliva production. Saliva, crucial for maintaining oral health, neutralizes acids, removes food particles, and prevents plaque buildup. A deficit in saliva heightens the risk of tooth decay, cavities, and gum disease.

Despite being cognizant of the potential impacts on dental health, dental professionals, including students, engage in vaping. This underscores the necessity of imparting knowledge to dental students, emphasizing the effects and perceived harm of vaping, and urging them to refrain from this practice. The current study stands out due to its focus on dental students in Karad city, where previous research on this topic is notably scarce.

## II. METHODOLOGY:

This cross-sectional questionnaire-based study will be carried out among under graduate and post graduate students of dental fraternity in Karad city. The validity of the questionnaire was checked by asking experts to scrutinize the questions, while content validity was checked by ensuring that the questions covered all the areas to be assessed. The ethical clearance was obtained from the ethics review committee of Krishna Institute of Medical Science (KIMS DU) before commencing the study. Informed consent was obtained from the

participants. A week time period was given to fill the questionnaire.

**Questionnaire:** A specially designed close ended google form questionnaire was used consisting of 20 questions. Questions consisted of four domains of awareness, value, knowledge and attitude of five questions each. It was formulated by referring similar study materials.

**Data collection:** We approached dental students of Karad city and obtained the email addresses of students to forward our google form questionnaire. A week time was given to fill up the questionnaire. Data was collected among all the undergraduates and postgraduates students of dental fraternity from Karad city. Those who failed to give consent for the study were excluded.

**Statistical Analysis:** The response rate was obtained using a Likert scale ranging from zero to five for assessment. The sample size obtained was 300. Statistical analysis was performed using SPSS (statistical package of social science) software version 21 for windows.

**Results:**

The sample size for this study was 300 but a total of 304 samples were collected from the undergraduates and postgraduates students of School of Dental Sciences, KVV, Karad to enhance the quality of the survey. The questionnaire was related to Knowledge, Awareness and Perception of Vaping.

From figure 1 we get to know about the sex distribution showed Around 52.3% females and 47.4% males.

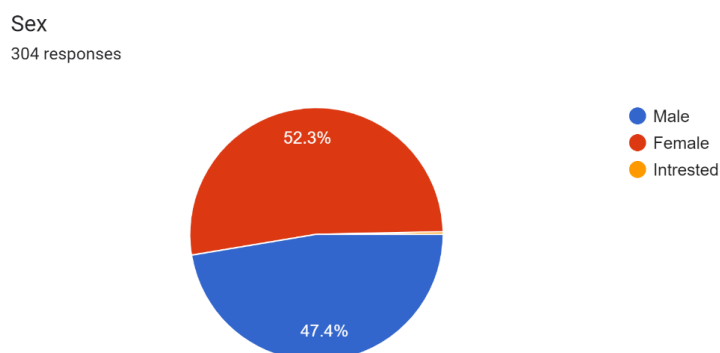


Figure 1

Age distribution was majorly between 18-30 years among which majorly smokers were distributed between the age of 20-26 years, the maximum being approx. 22 years of age (12.5%) of total responses obtained as seen in figure 2

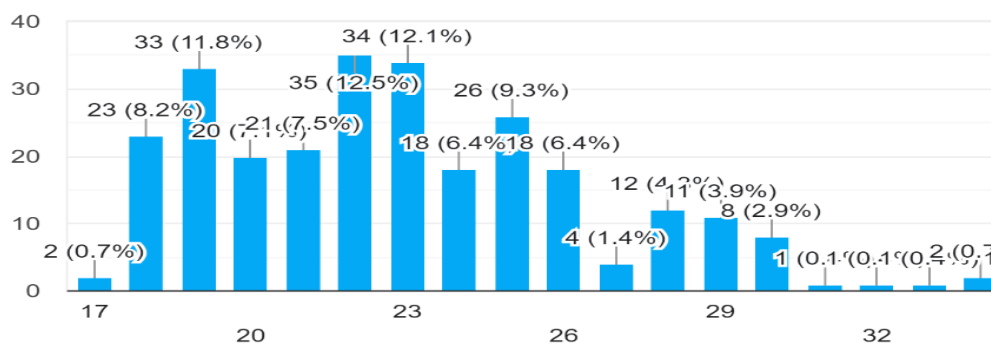


Figure 2

For question 1) asking students if they smoked on a daily basis, around 55.3% dental students responded with “not at all”, 26.6% were daily smokers and 17.4% students smoked less than daily as seen in fig 3:

1) Do you currently smoke tobacco on a daily basis, less than daily or not at all?  
304 responses

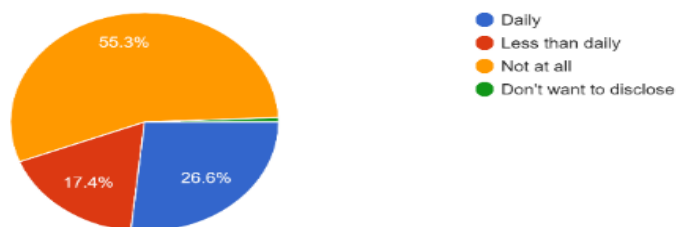


Figure 3

For question 2) asking students if they have smoked in the past on a daily basis, 54.6% students did not smoke at all, 27% smoked daily and 17.1% smoked less than daily as seen in the fig 4:

2) In the past, have you ever smoked tobacco on a daily basis, less than daily or not at all? (if your answer is option (c) then skip to question 9)  
304 responses

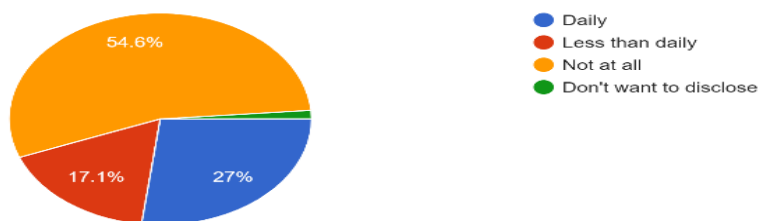


Figure 4

In question 3) 58.1% students had not smoked more than 100 cigarettes in their lifetime whereas 41.9% students had smoked more than 100 cigarettes in their life as seen in the fig 5:

3) Have you smoked more than (approximately) 100 cigarettes in your life?  
246 responses

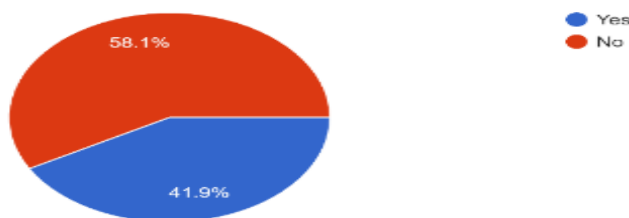


Figure 5

29.4% students did not smoke tobacco even 1 full packet of cigarettes daily whereas around 23.5% students smoked 1 pack whereas 8.3% smoked 2 packs daily as seen in fig 6:

### 5) How many packs of cigarettes did/do yo 204 responses

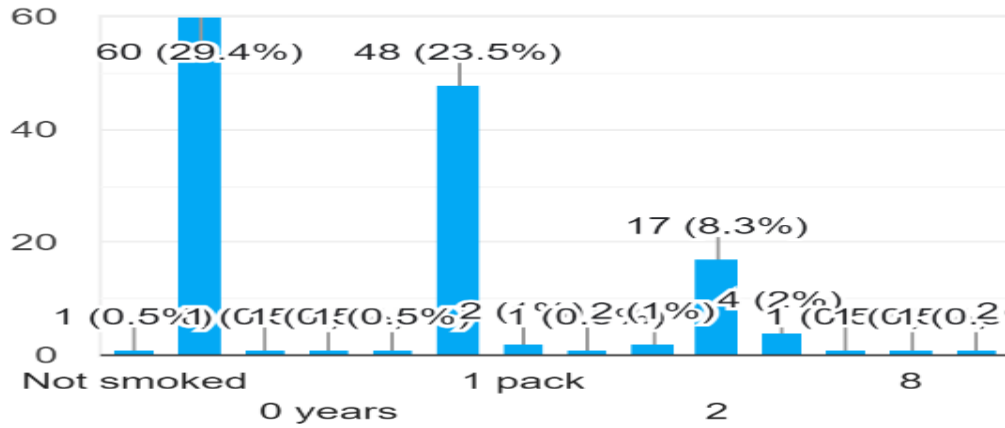


Figure 6

60.7% students did not receive advice about quitting tobacco from a doctor whereas 39.3% received about quitting tobacco from a doctor. (fig 7)

6) Have you ever received advice about quitting tobacco smoking from a doctor?  
 229 responses

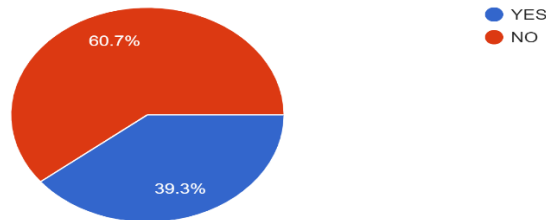


Figure 7

Out of the total responses, 42.2% students never considered quitting smoking and 57.8% considered quitting smoking. Out of the smokers, 44.4% students never tried quitting smoking but 55.6% students never tried quitting smoking. (fig 8 & 9 respectively)

7) Have you ever considered quitting smoking?  
 223 responses

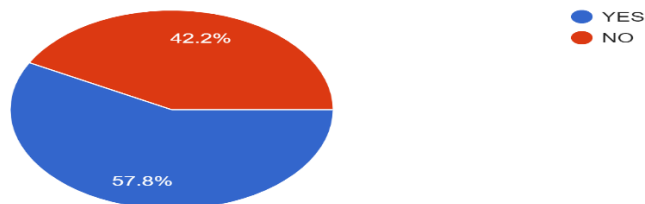


Figure 8

8) Have you ever tried quitting smoking?

225 responses

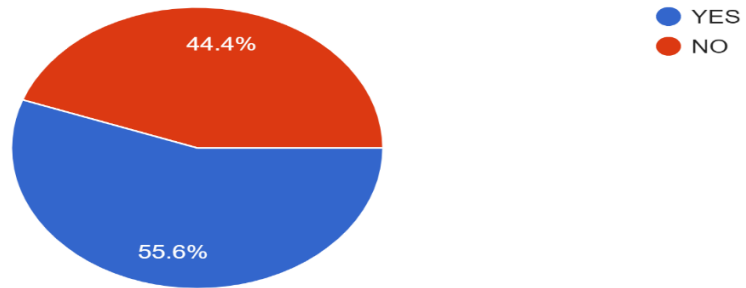


Figure 9

25.9% students have not even heard about e- cigarettes and 67.9% students from total responses have heard about them. Out of the 67.9% students who have heard about e- cigarettes, 47.3% got to know about it through their friends, 39.6% students got to know about it from their exposure to mass media or the internet and 8.8% students from doctor or health professionals. (fig 10 and 11)

9) Have you ever heard about electronic cigarettes(e- cigarettes or vapes)?

305 responses

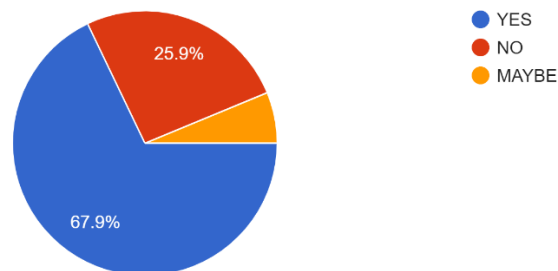


Figure 10

10) Where did you get to know about e- cigarettes?

283 responses

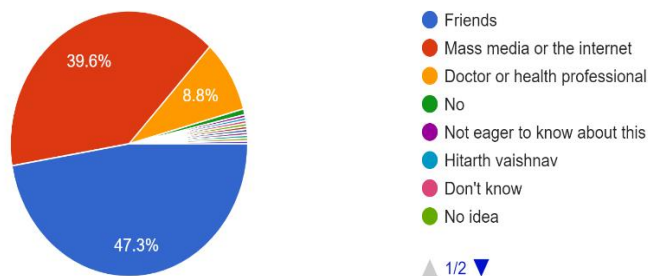


Figure 11

54.5% students would not want to use e-cigarettes and 40.1% students desired to use e-cigarettes. Around 41.1% students think that e-cigarettes actually help in quitting smoking, 22.3% students feel that e-cigarettes do not help in quitting smoking and 29.1% were not sure about it and answered the question with “I don’t know.”( fig 12 and fig 13)

11) Would you want to use e- cigarettes?

292 responses

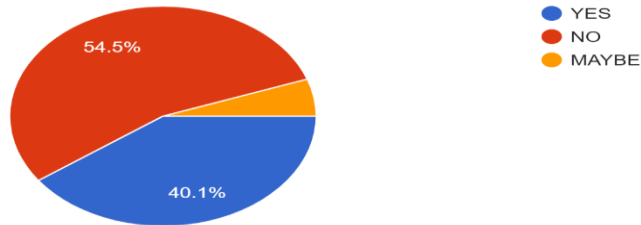


Figure 12

12) Do you think e- cigarettes help in quitting smoking?

292 responses

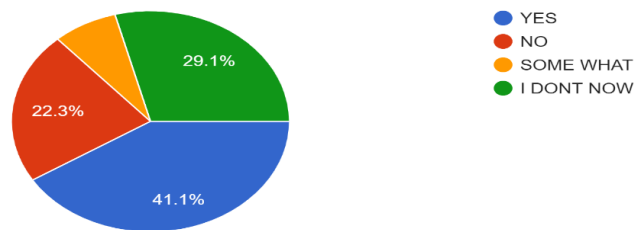


Figure 13

The survey showed that 59.9% students now that e-cigarettes are associated with diseases such as COPD, asthma, lung cancer or heat diseases, 11.3% students feel that it does not cause any such diseases, 8.9% students answered as e- cigarettes somewhat are the cause of such diseases and 19.9% students do not really know about it. (fig 14)

13) Do you think e- cigarettes are associated with diseases such as lung cancer, COPD, asthma, or heart diseases?

292 responses

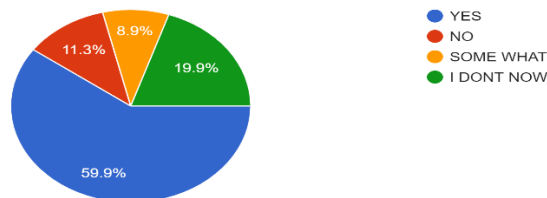


Figure 14

Question pertaining to addiction of e-cigarettes, major percentage of students i.e.57.9% think that its addictive, 9.7% students do not think that it is addictive, 8.6% students think that e-cigarettes are somewhat addictive and 23.8% do not know whether they are addictive or not.54.6% students voted that it is not safe to use e-cigarettes in pregnancy, 13.4% students said that it is somewhat safe whereas 13.1% think it is safe to use e-cigarettes in pregnancy and 18.9% do not about it. (fig 15 and fig 16)

14) Do you think e- cigarettes are addictive?  
290 responses

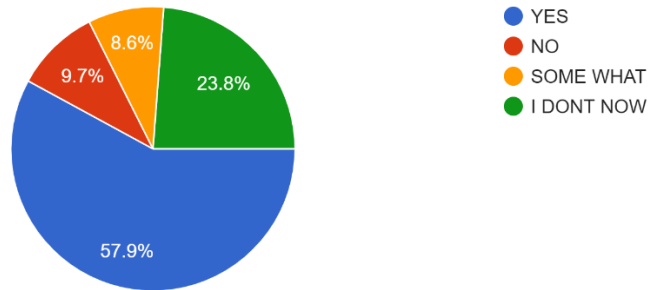


Figure 15

15) Do you think e- cigarettes are safe to use in pregnancy?  
291 responses

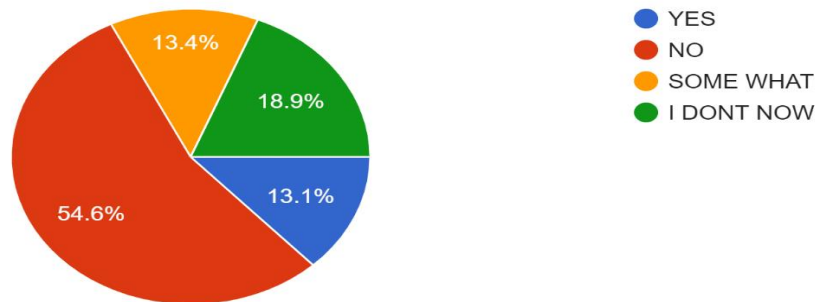


Figure 16

60.7% samples do not use cigarettes whereas 39.3% use cigarettes, also, 23.2% students use it daily, 52.6% students do not use it at all, 7.5% students do not know whereas 16.7% students use e cigarettes less than daily. (fig 17 and fig 18)

16) Do you use e- cigarettes ?  
290 responses

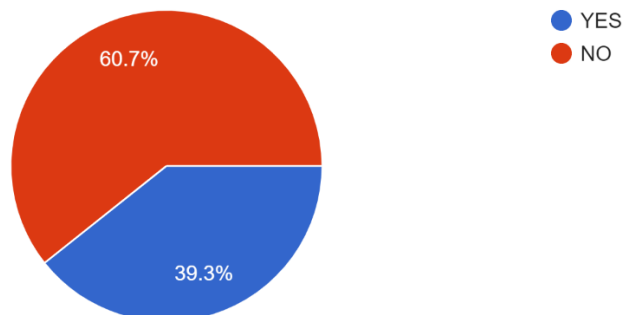


Figure 17



## 17) How often do you use e-cigarettes?

293 responses

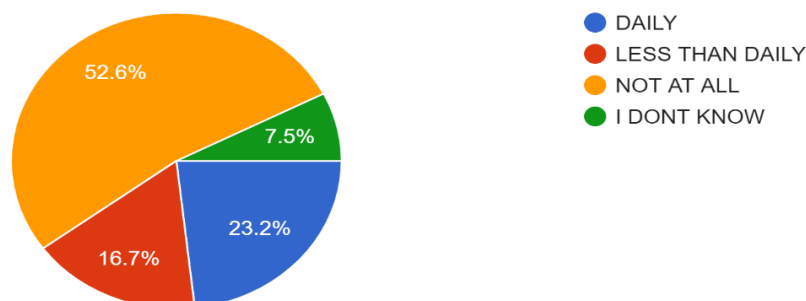


Figure 18

**III. Discussion:**

Health practitioners should be concerned about the negative health implications of electronic cigarettes. The bulk of participants, who intend to pursue careers in dentistry, felt obligated to participate in smoking cessation programs. In an American population research, the young adults indicated that they would be open to speaking with dentists about vaping. If they learned that vaping is bad for their dental health, some would even be willing to cut back or stop (Martell et al., 2020). According to another study, college students continued to use e-cigarettes even after learning about their potential health risks because they believed the devices would help them to cope with the pressures and hectic lifestyle (Copeland et al., 2017). In a Selangor local study of the general people, the educated group viewed vaping mostly as a helpful aid for quitting smoking and as less dangerous than traditional cigarettes (Ibrahim et al., 2017). While most School of Dental Sciences dental undergraduate and postgraduate participants did not achieve a high score in the knowledge component, they did correctly identify the facts regarding vaping, including the fact that it is not a recommended method of quitting smoking. Despite this, all of these college students believe that vaping is not as bad as smoking. While insufficient knowledge may make it difficult to educate and counsel patients (Pepper et al., 2014), it is recommended that medical and dentistry students have a sufficient understanding of detrimental effects of vaping.

Research indicates that receiving brief counseling on quitting smoking can enhance long-term abstinence rates by 5%. Additionally, supplementary medicine has the potential to increase these rates by 50% to 70%. (Stassen & Hammarfjord, 2015). Electronic cigarettes are being employed as a smoking cessation aid due to the population's sharp rise in vape use. When combined with behavioral assistance, e-cigarettes proved to be a more successful smoking cessation method than nicotine replacement treatment. E-cigarettes received higher ratings and were shown to be more successful in easing the symptoms of tobacco withdrawal (Hajek et al., 2019). Though there have been few studies demonstrating the effectiveness of e-cigarettes as a smoking cessation aid, caution should be exercised when using this information. Electronic cigarettes are being employed as a smoking cessation aid due to the population's sharp rise in vape use. Particularly on social media, the mass media is becoming more and more influential in promoting e-cigarettes. Social media exposure exposed half of the study participants to e-cigarettes.

Collins and colleagues have observed that while there is no proof to support the idea that exposure to e-cigarette commercials influences the public's pattern use of e-cigarettes, it does influence the public's impression of e-cigarettes. Exposure to e-cigarette marketing was linked to a decrease in the perceived harm of e-cigarettes, which may influence the intention to use them (Vogel et al., 2021; Pokhrel et al 2015). Conversely, social media networks could serve as a means of informing young people about the dangers of e-cigarettes (Lazard, 2021).

This research has certain restrictions. Because the participants were selected from among health students specifically aspiring dentists, it is more likely that they will comment negatively on the usage of electronic cigarettes as a smoking cessation method. Future research should take into account variables like gender and ethnicity because it was shown that there is a high correlation between gender and the perception of the health hazards connected with vaping (Minhat et al., 2017).

In this questionnaire survey, the main objectives were as follows:

- To evaluate the knowledge of the harmful effects of vaping among undergraduate and postgraduate students of dental fraternity.
- To assess the awareness of the harmful effects of vaping among undergraduate and postgraduate students of dental fraternity.
- To evaluate and assess the perceived harm of vaping among undergraduate and postgraduate students of dental fraternity.
- To evaluate the knowledge of the harmful effects of vaping among undergraduate and postgraduate students of dental fraternity.

A mean age of 24.6 was reported from 304 dental students, comprising both undergraduate and postgraduate students. Most of them (55.3%) and (60.6%) have never used e-cigarettes or smoked. It was discovered that 26.5% of individuals were smokers, 39.4% had previously used e-cigarettes, and 23.3% were presently using them.

Out of all the students who responded, 67.9% had heard about electronic cigarettes, whilst 25.9% had never heard of them. Of the 67.9% of students who have heard about e-cigarettes, 47.3% learned about it from peers, 39.6% learned about it via media or the internet, and 8.8% learned about it from doctors or other health experts.

40.1% of students wanted to use e-cigarettes, compared to 54.5% who did not want to use them. About 41.1% of students believe that e-cigarettes genuinely assist in quitting smoking, compared to 22.3% who believe that e-cigarettes do not aid in stopping smoking and 29.1% who were unsure and said, "I don't know."

According to the survey, 59.9% of students were aware that e-cigarettes are linked to conditions like COPD, asthma, lung cancer, or heat-related illnesses; 11.3% of students believed that e-cigarettes had no such link; 8.9% of students responded that e-cigarettes are somewhat responsible for these conditions; and 19.9% of students had no idea. 40.1% of students wanted to use e-cigarettes, compared to 54.5% who did not want to use them. Regarding e-cigarettes, about 41.1% of students believe that they genuinely aid in quitting smoking, 22.3% believe that they do not, and 29.1% are unsure.

When asked about the prevalence of e-cigarette addiction, the majority of students—57.9%—think that the product is addictive, followed by 9.7% who disagree, 8.6% who believe that e-cigarettes are somewhat addictive, and 23.8% who are unsure. In a poll, 54.6% of students stated using e-cigarettes while pregnant is not safe, 13.4% thought it is somewhat safe, 13.1% said it is okay, and 18.9% said they are not sure.

In addition, 23.2% of students use e-cigarettes daily, 52.6% do not use them at all, 7.5% of students do not know, and 16.7% of students use them less frequently than daily. Of the samples, 60.7% do not smoke, while 39.3% do.

#### IV. Conclusion:

The landscape of oral health and its intersection with modern practices, particularly the pervasive use of e-cigarettes among dental students, unveils a complex tapestry of attitudes and knowledge. This study, conducted among dental students in Karad city, has provided valuable insights into their awareness, perceptions, and practices related to vaping. The findings illuminate a paradoxical scenario where a significant portion of dental students, despite being healthcare professionals in training, exhibits a lack of comprehensive knowledge

regarding the intricacies of e-cigarettes. The majority, while refraining from conventional smoking, has engaged with or is currently using e-cigarettes. This paradox underscores the urgency of addressing the information gap that exists within this demographic. The study underscores the necessity for targeted educational interventions. While dental students perceive e-cigarettes as less harmful than traditional smoking, their behaviors suggest a divergence from this perception. This highlights the need for a nuanced approach to education, addressing not only the potential health risks associated with vaping but also dispelling misconceptions surrounding its harm reduction narrative. Moreover, the prevalence of e-cigarette use among dental students indicates a critical need for clear guidelines and regulations at both institutional and broader societal levels. This extends beyond the confines of the dental community and calls for collaborative efforts to curb the rising trend of e-cigarette usage. In conclusion, this study not only contributes to the understanding of the knowledge and attitudes of dental students in Karad city but also serves as a clarion call for comprehensive educational programs and regulatory measures. By bridging the existing gap in awareness and perception, we can empower future dental professionals to make informed choices about their own health and, in turn, become effective advocates for the oral health of the wider population. The path forward involves a concerted effort to reshape perceptions, enhance knowledge, and institute effective guidelines, ultimately fostering a healthier and more informed dental community.

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