

INCREASING INCIDENCE OF USAGE OF E-CIGARETTES – AN UNHEALTHY TREND

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ABSTRACT

INTRODUCTION: The many hazards of nicotine smoking is well understood. To counter this habit, the electronic cigarettes or e-cigarettes were introduced. These e-cigarettes come with their own bag of hazards. Despite it being marketed as a 'harm-reduction' alternative to smoking-label, it is viewed by many as a 'poor substitute' for conventional smoking. Recent reports lay great emphasis on the increasing popularity of vaping especially amongst adolescents and teenagers worldwide. In order to face this new challenge, healthcare professionals and dentists alike will need to become familiar with the available scientific literature concerning e-cigarettes and vaping. To add credence to the aforementioned facts, an online survey was conducted to assess the various perspectives of this current behavioral fad.

AIM: To characterize e-cigarette usage and to summarize its effects on the users.

MATERIALS AND METHODS: An online questionnaire survey was conducted among initial vapers, previous smokers and dual users.

RESULTS: Use of electronic cigarettes worldwide is seen to be on the rise. This article highlights the use of e-cigarettes by smokers to quit combustible cigarettes and an attempt to study the hazards of vaping.

KEYWORDS: e-cigarette, vaping, smoking hazards.

INTRODUCTION:

Smoking has been primarily practiced as a route of administration for recreational drug use, as the combustion of products, vaporize, consequently delivering chemical substances into the respiratory system, where they are rapidly absorbed and transported into the circulatory system and finally reaching the bodily tissues.

Use of e-cigarettes or vaping is a relatively recent phenomenon that is quickly gaining the interest of many long-time tobacco users. Today, e-cigarettes (vape) have become a preferred alternative for nicotine usage among many smokers because of their near realistic look, feel and taste compared to traditional cigars. Though many claim that e-cigarettes are a safer alternative, it still holds that they do contain potentially harmful contaminants that could in the long run prove to be hazardous to both general and dental health.

HISTORY OF SMOKING:

Smoking can be traced back to 5000BC, finding a place in many different cultures globally. In the earlier days, smoking was related to various religious ceremonies – as offerings to deities, as cleansing rituals, spiritual enlightenment and for its hallucinogenic properties. Later however, the practice of smoking, especially tobacco, quickly spread its tentacles across the world, thus slowly but silently becoming a form of social activity. Gradually however it came to be viewed as a deadly health hazard leading the cause for myriad of diseases – such as bronchogenic carcinoma, cardiac problems, respiratory problems, erectile dysfunction and birth defects,^[1] thus propelling many countries to seek ways to discourage its denizens to give up this health hazard. Later however, tobacco related substances like cannabis, opium, marijuana, dried reptile skin, incense sticks and various other herbal pastes in addition to their medicinal values, were also sought for their intoxicating properties. In the current scenario, smoking has come to be regarded as a global menace as many countries report an alarming increase of its usage, especially amongst teenagers and adolescents.

TOBACCO CONTROL:

Tobacco control is a field of International

Public Health Science policy and practice dedicated to addressing tobacco use, and thereby reducing the morbidity and mortality it causes. Today, tobacco control, by virtue of its numerous hazards, has become a priority area for the World Health Organization (WHO). The WHO on its part is seeking to rein in smokers and other nicotine users through its Framework Convention on Tobacco Control.

ELECTRONIC CIGARETTES:

Electronic cigarettes or e-cigarettes are battery operated devices (Fig 1)² that people resort to, to simulate the experience of smoking a cigarette.³ They generally work by heating a liquid which generates an aerosol or vapor that is inhaled by the user. Thus, today the usage of e-cigarettes is commonly referred to as “vaping”.

E-cigarette is a recent innovation by the Chinese pharmacist Hon Lik. After their initial introduction into the market, it slowly gained popularity especially amongst the youth, leading to an exponential boom. Till date, the majority of users still smoke tobacco even though the e-cigarette was presumed to replace the nicotine laden conventional cigarettes.



Fig 1- Electronic cigarettes

HOW DO E-CIGARETTES WORK?

The majority of e-cigarettes are designed (Fig 2)⁴ as follows:

- A cartridge/reservoir to store the liquid – generally containing varying amounts of nicotine, flavoring agents and other chemicals.
- An atomizer for igniting.
- An in-built battery to serve as power source.
- A customized mouth piece that the person uses to inhale.

- It has been claimed that the majority of toxic chemicals found in tobacco smoke are almost non-existent in e-cigarette aerosols, but can contain other toxicants and traces of heavy metals at permissible levels.

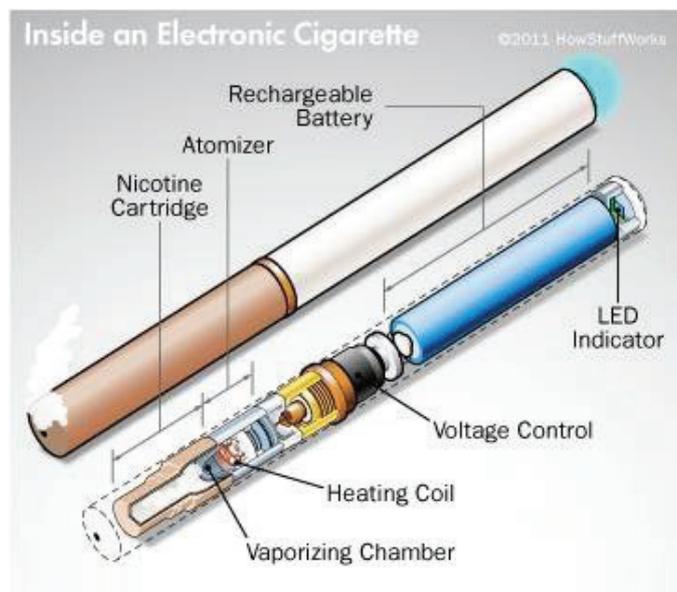


Fig 2- Components of electronic cigarettes

USE OF E-CIGARETTES:

From the time it was introduced into the market, there has been a noted escalation in the sales of e-cigarettes. Today there are several million users globally, with the United States (US) & United Kingdom (UK) recording a peak.⁵ Most users give a previous history of smoking while many report several reasons for its use.

- Recreational use
- To abstain from/quit smoking
- Vaping is a healthy alternative to smoking
- They are odor free
- Less hazardous.

However there exists today a small percentage of “vapers” who have expressed dissatisfaction and safety concerns while vaping.⁶

ADVERSE EFFECTS OF VAPING:

Though there is literature ⁷ that supports the evidence that e-cigarettes may be safer than tobacco cigarettes, its safety is yet to be ascertained. In July 2014, a WHO report cautioned about the potential

risks of using e-cigarettes. A Cochrane review,⁸ however found no serious adverse effects reported in clinical trials. Consequentially, today, it is thought that e-cigarette usage can expose individuals to certain hazards; aside from toxicity, there are also risks of misuse or accidents such as can happen when contacting liquid nicotine. Risk of battery explosion cannot be ignored.

E-cigarettes create vapors consisting of ultrafine particles of propylene glycol and glycerine, negligible amounts of toxicants, carcinogens, heavy metals and metal nanoparticles and other harmful particles (Fig 3).² Till date, there is a dearth of conclusive information regarding environmental issues in relation to e-cigarette production and usage.

Future scenario evidence supporting use of e-cigarettes as a gateway to tobacco smoking in later life is mixed and contradictory. Though current research suggests e-cigarettes as less harmful than cigarettes, it is only logical to assume that nicotine in any form is highly addictive. Also, the most recent Cochrane review has substantiated that though there is evidence that e-cigarettes can help smokers quit the habit in the long term, it is not devoid of potentially harmful impacts.

To add credit to the above said data, an online survey targeting first time smokers/ chronic smokers/ vapers/ dual smokers was conducted to assess the slow but steadily increasing use of e-cigarettes. The respondents filled a questionnaire form to provide authentic data.

THE E-CIGARETTE AEROSOL THAT USERS BREATHE FROM THE DEVICE AND EXHALE CAN CONTAIN HARMFUL AND POTENTIALLY HARMFUL SUBSTANCES:

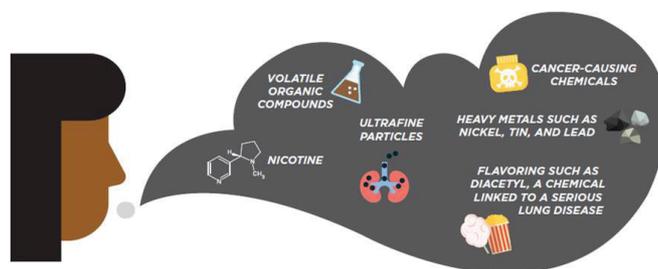


Fig 3- Nanoparticles present in smoking vapors

METHODOLOGY

An online questionnaire consisting of about 25 questions was created using Google forms. The link was circulated among vapers in Chennai city

population, over a period of 1 month. The questions were mostly close-ended with range of possible answers, and a few open-ended questions to obtain unexpected and valuable information.

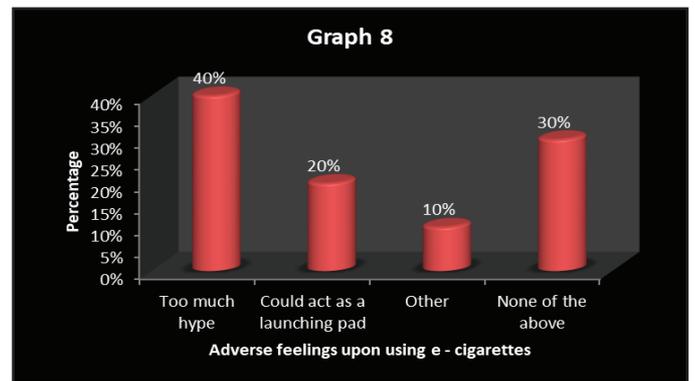
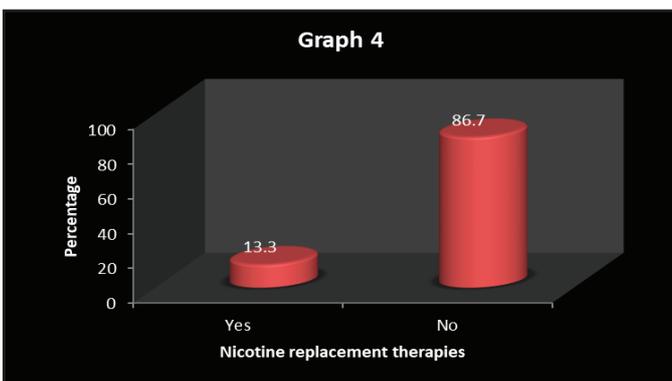
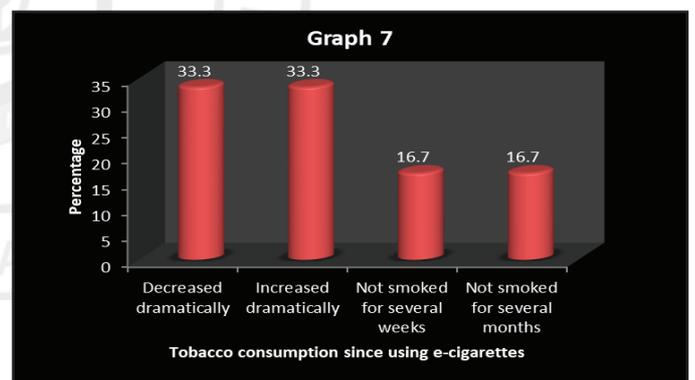
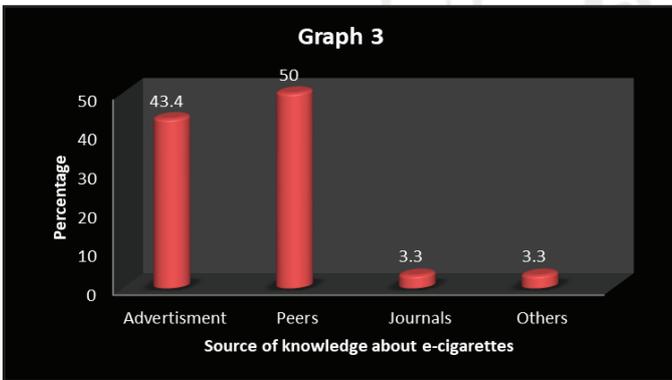
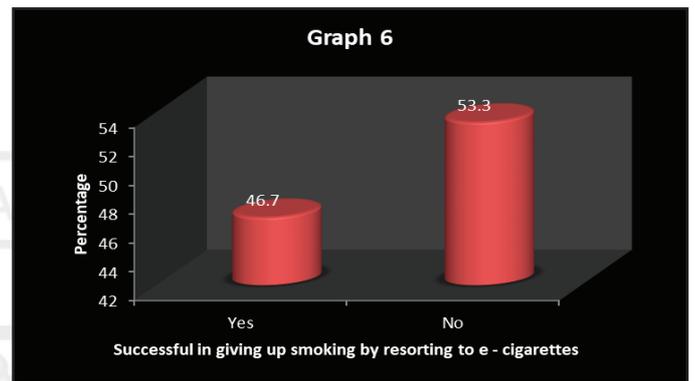
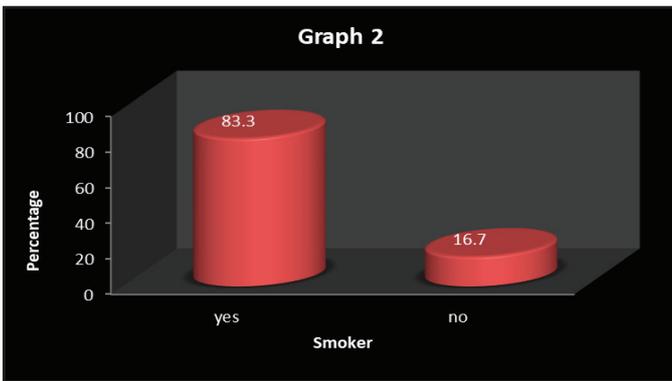
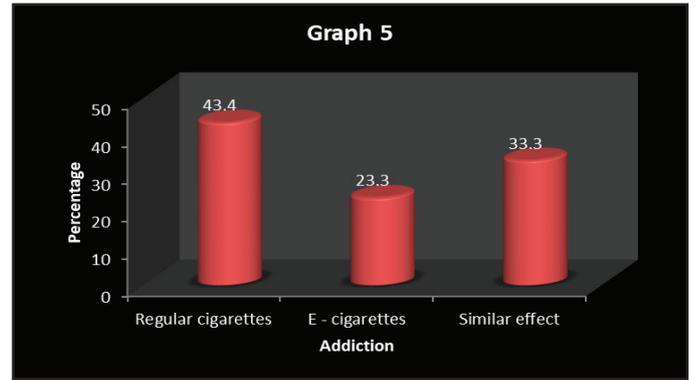
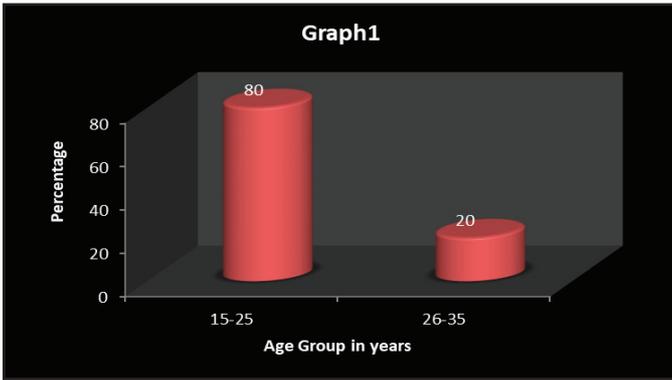
INCLUSION CRITERIA: vapers, previous smokers but current vapers, dual users (both regular cigarettes and e-cigarettes).

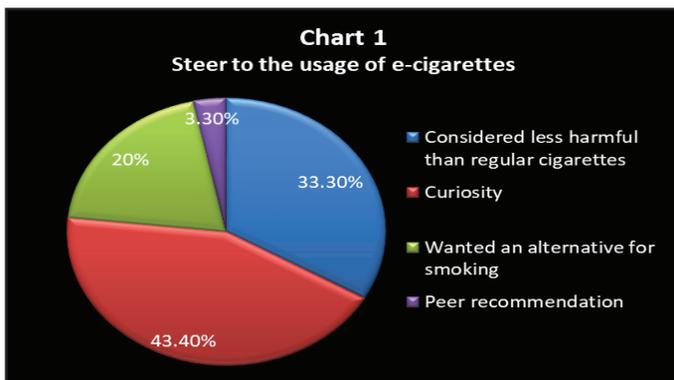
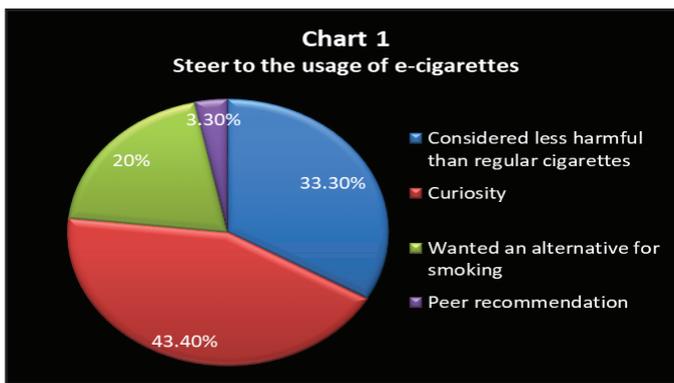
EXCLUSION CRITERIA: only smokers, people who had knowledge about vaping but had not vaped yet.

The questionnaire was filled by 54 respondents comprising of vapers/smokers/dual users and others. Taking into account, the inclusion and exclusion criteria, 30 respondents were filtered and the responses were subjected to statistical analysis. Data for this study were entered in Microsoft Excel and analyzed in the SPSS statistical package version 20.0. Descriptive statistics were computed for all variables. An association between knowledge about e-cigarettes and addiction to vaping versus age group, gender and smokers were determined using Pearson's chi-square test. Results were considered statistically significant when the p-value was <0.05 .

RESULTS:

- The study population consisted of 24 males and 6 females, who were using e-cigarettes.
- About 80% of the study population were in the age range of 15-25 years, while 20% were 26-35 years. (Graph 1)
- As regards, the rate of smoking in years, it was shown that 83.3% of the study population were smokers whereas 16.7% were not previous smokers (Graph 2). Among the smokers, 56% had a previous history of smoking for 3-5 years and 44% were smoking for the past 6-10 years.
- Although the entire study population was using e-cigarettes, only 33.3% used e-cigarettes on a regular basis, while the remaining 66.7% use them rarely.
- When asked about the knowledge of vaping, 50% of the study population confessed to having got to know about vaping through their peers, 43.4% through advertisements and 3.3% through journals. (Graph 3)
- Curiosity (43.3%) was the major lead to the usage of e-cigarettes, whereas 33.3% considered e-cigarettes as less harmful than regular cigarettes while 20% wanted an alternative for smoking. Peer recommendation was a steer to the usage of e-cigarettes in 3.3% of the surveyed population. (Chart 1)
- Only 13.3% of the study population had tried nicotine replacement therapies and it was only in the form of nicotine chewing gum. Despite the availability of Nicotine patches, Nicotine inhaler, Nicotine Tablets/ lozenges and Nicotine mouth spray, none had tried them. (Graph 4)
- Despite the usage of e-cigarettes, 43.3% considered regular conventional cigarettes as being more addictive. While 23.3% felt e-cigarettes to be more addictive, 33.3% owed a similar effect to both. (Graph 5)
- Of the numbers surveyed, 46.7% resorted to the usage of e-cigarette as a means to wean away from regular smoking and were successful; but 53.3% denied the same. (Graph 6)
- While 33.3% of the study population felt that 'tobacco consumption had dramatically decreased since using e-cigarettes', while an equal number (33.3%) felt that 'tobacco consumption had dramatically increased since using e-cigarettes'. From the remaining, 16.7% had not smoked for several weeks while 16.7% had not smoked for several months. (Graph 7)
- Concerning the recommendations of e-cigarettes as a predictable alternative to quit/cut down on conventional smoking, 66.7% of the study population tends to agree with this concept, while 33.3% turned down the recommendation. Among the 66.7%, 40% was extremely successful, 55% was not very successful and 5% was very unsuccessful in abstaining from smoking.
- Regarding the side effects of vaping, 46.7% of the study population did not experience any side effects in e-cigarette usage, while 53.3% experienced various side effects such as headache (37.5%), vomiting (37.5%) and feeling sick (18.8%). 'Hair fall and sinusitis' were the other side effects stated. (Chart 2)
- At this juncture, it would only be fitting to the context to comment on the adverse feelings felt by the e-cigarette users – this amounted to 33.3% of surveyed population; 40% felt 'too much hype' and 20% felt that 'it could act as a launching pad'. (Graph 8)





DISCUSSION:

Effects of smoking have been well established and recognized over the previous decades. Today electronic cigarettes (e-cigarettes) are emerging as an alternative popular mode of nicotine consumption. It is now well acclaimed that nicotine use in any form leads to general health hazards with concurrent poor oral health.

Poor oral health and consequent tooth loss impacts quality of life and is a significant health concern.⁹ An alarming increase in deterioration of dental health as result of nicotine use has garnered much attention and efforts are on to curtail to an optimum extent, the usage of nicotine in any form. Thus, it has come to be viewed that though usage of e- cigarettes lessens the health burden it in no way mitigates various other toxic aftermath of nicotine. Nicotine, one of the main constituents of e-cigarettes plays a stellar role in tooth loss due to its ability to reduce tooth mineralization through altered genetic signaling and activation of inflammatory pathway.¹⁰

There is emerging evidence that suggests other components of e-cigarettes promote oral

inflammation and senescence of periodontal fibroblast.¹⁰ Added to this vaping is increase in inflammation, oxidative stress, altered cell response, an impaired host response and dysregulated repair mechanism leading to poor oral health.¹¹

Our questionnaire pilot study established the fact that though e-cigarettes did not contain concentrated nicotine as do conventional cigarettes, there was irrefutable evidence about the health hazards associated with vaping. Till date majority of published studies on the health consequences of e-cigarettes have focused on the effects of vaping mostly on the cardiovascular system/pulmonary system, given the strong links associating nicotine usage and diseases of these organ systems. Our study has some limitation - first larger sample size would prove to be more credible; being a cross-sectional study clinching causality between regular vaping and poor oral health could not be defined; moreover as it is self-reported it is subject to information bias.

CONCLUSION:

It has globally been perceived that usage of e-cigarettes is considered a safer alternative to conventional cigarettes as it contains fewer chemicals and toxicants. However, many studies^{1,5} have substantiated the fact that e-cigarettes do definitely cause adverse health effect-more so in the oral cavity. At this juncture it is worth bearing in mind that though e-cigarettes use “vapors”, it cannot be denied that it still carries with it a noted mortality rate. Though e-cigarette possess some of the (supposed) good features, it harbors some potentially concerning (ugly) ones. Our main goal should be stringent tobacco control and the evolution of younger generation which is aware of the myriad health and oral hazards linked to this (lesser evil) and choose to abstain from it.

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Nil

CONFLICTS OF INTEREST:

There are no conflicts of interest.

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