

**E- CIGARETTES TO ASSIST WITH SMOKING CESSATION****Vaishnavi V. L.\*<sup>1</sup>, Sowparnika Treasa Sabu<sup>2</sup> and Prof. (Dr.) Shaiju S. Dharan<sup>3</sup>**

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**ABSTRACT**

**Background:** Smoking is a hard habit to break because tobacco contains the very addictive chemical nicotine. People start smoking for different reasons. Almost all adult tobacco users started before they were 18 years old. Cigarette smoking harms nearly every organ of the body, causes many diseases and reduces the health of smokers in general. Smoking cessation is important for improving quality of life. Smoking cessation is not easy, different methods are follow for cessation, some people switching to e cigarettes. E cigarettes are safe alternative to regular cigarettes. **Methods:** Previously published articles regarding the role of e cigarettes in smoking cessation have been collected and reviewed. **Observations:** E cigarettes are safer than regular cigarettes. It can be used at any age group for smoking cessation. But some hidden toxic substances are found in e cigarettes that are very harmful in health.

**KEYWORDS:** Smoking cessation, e cigarettes, cigarettes.

**INTRODUCTION**

According to WHO, there are about 8 million people die by use of tobacco each year. More than 7 million death occurs due to direct tobacco use while 1.2 million are non-smokers being exposed to second hand smoke.<sup>[1]</sup> India is world's third largest tobacco growing country and second largest consumer of tobacco products in the world. in India about 267 million people uses tobacco. among adults, about 42.4% men and 14.2% women are currently uses tobacco products and about 29.6% men and 12.8% women are uses smokeless tobacco.<sup>[2]</sup> According

to the Global Adult Tobacco Survey (GATS)2016-2017 there are 99.5 million people who smoke and 199.4 million people who chew tobacco in India.<sup>[3]</sup> Tobacco use is the most common preventable cause of death. About half of the people who don't quit smoking will die of smoking related problems. Smoking cessation is the important for a good health. Some people try several times before they succeed. There are many ways to quit smoking. Some people completely stop suddenly and others benefit from step by step manuals, counselling and medicine or products that help reduce nicotine addiction.

Nowadays, two other methods are used to quit smoking, these are, Electronic nicotine delivery systems (ENDS) and electronic non-nicotine delivery systems (ENNDS) respectively.<sup>[4]</sup> The ENDS which contain nicotine and heating of liquid containing causing it to vaporize so that a person can inhale it. Electronic cigarette (e -cigarettes, e- hookahs, vaporizer cigarettes, and vapes and vape pens) is the most common type of ENDS.

In this review, aimed at revealing e-cigarette is the methods for smoking cessation in any aged group.

## E – CIGARETTES

In 2003, the first commercially successful e cigarette is created in Beijing, China by Hon Lik, a 52 year old pharmacist, inventor and smoker. He reportedly created the device after his father, also a heavy smoker, dies of lung cancer. In 2008, the WHO, proclaims that it does not consider the e cigarette to be a legitimate smoking cessation aid and demands that marketers immediately remove from their materials any suggestions that the WHO considers e cigarettes safe and effective.<sup>[5]</sup>



Figure 1: Diversity of E-Cigarettes.

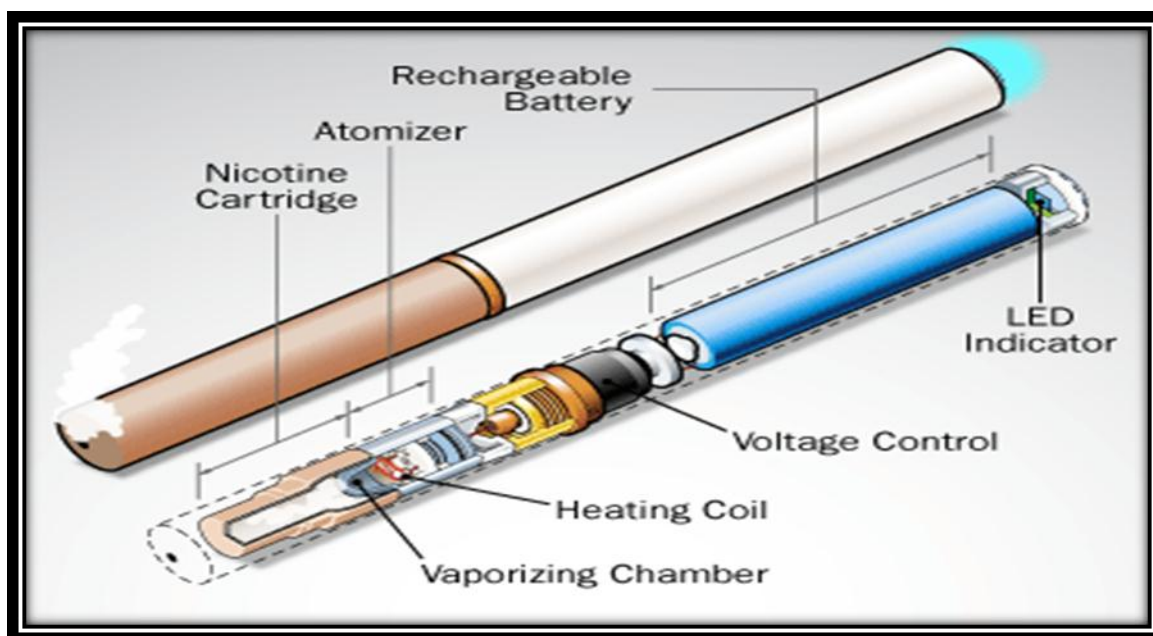
Older generation of e cigarettes used a form of nicotine called free base nicotine. A first generation e cigarette is closely resemble with cigarettes are not rechargeable and is disposable. A second generation e cigarette is rechargeable and pen like structure. A third generation cigarettes are refillable and some parts may be replaceable (figure 2). The most recent generation is fourth generation of e cigarettes are pre filled pod system like JUUL and refillable system like Suorine Drop and Myblu use nicotine salts in the e liquid (figure 3). JUUL refill contains natural and harmless flavours such as mango, cucumber, and mint. And is also contains as much nicotine as a pack of 20 cigarettes.



**Figure 2: Evolution of the E-Cigarettes** (Shown to demonstrate approximate scale, Source : National Academies of Sciences, Engineering and Medicine, Public Health Consequences of E – Cigarettes).



**Figure 3: Current Generation of E-Cigarettes.**



**Figure 4: Inside an E-Cigarette.**

There are four different components are present in E-Cigarettes, including, Nicotine cartridge, Atomizer, Rechargeable battery and Mouth piece.

**Nicotine cartridge:** it is the reservoir of e-liquid. In some cases it is known as cartomizer, (Figure 5) because is the integration of atomizer and cartridge. Nicotine concentration in e liquid is 18-36mg/ml.<sup>[6]</sup> Some factors are influence the absorption of nicotine such as pH, aerosol particle size). To mimic the tobacco effect add some flavours like sweet, fruit, desserts, candy etc. menthol is the major component of e liquid but in certain cases non-menthol' e-liquids assessed<sup>[7]</sup> in January 2020, FDA issued an enforcement policy on unauthorized flavoured cartridge based e cigarette products including fruit and mint flavours, that appeal to kids.<sup>[8]</sup> Menthol helps to reduce the effects of nicotine and they leads to initiation of the taste and sensory properties of the menthol itself.<sup>[9]</sup>

At a pH of 8.02, nicotine converted to unionized form that rapidly absorbed through the biological membrane. Propylene glycol (PG) and vegetable glycerine (VG) is the base of e liquid.



**Figure 5: Cartomizer.**



**Figure 6: Clearomizer.**

**Atomizer:** that helps to heating the e liquids into vapour or mist that the user inhales. Temperature is ranges from 40 to 65 ° C.<sup>[10]</sup> Atomizer is available in 3 forms are, Disposable atomizer, Replaceable coil head atomizer and Rebuild- able atomizer (Figure 7). In some atomizer contains e liquids is known as Rebuild able tank atomizer. Rebuild able dripping atomizer is another type; it helps to fasten the coil and to provide a closed path for electric energy from the batteries that heat up the coil.

Clearomizer (Figure 6) are one of the newest and most popular devices on the market. These types of devices are usually cylindrical and feature a clear polycarbonate plastic or Pyrex glass tank. Cartomizer are similar design of atomizer, have polyfill wrapped around a heating coil. A polyfill soaks e liquid and allows for longer vape time over atomizer.

Rechargeable battery: powers the e cigarettes and can be charged. Lithium batteries are commonly used. It can be connected to the vaporization chamber and an atomizer. LED is connected to the end of the e cigarettes, that lights up when the user inhales, stimulating

flame. A 2017 report from the U.S. Fire Administration in charge of fire data collection, education, research and training stated; the shape and construction of e cigarettes can make them to behave like flaming rockets when a battery fails.<sup>[11]</sup> Some can even be charged with a USB cord connected to computer. Lithium-ion batteries should not be used in e-cigarettes.



**Figure 7 Atomizer and its type.**

### **ROLE OF E-CIGARETTES IN SMOKING CESSATION**

On May 10, 2016, the U.S. Food and Drug Administration (FDA) issued a final rule that brought e-cigarettes under the FDA's tobacco product authority. With this rule making, FDA now regulates the manufacture, import, packaging, labelling, advertising, promotion, sale, and distribution of e-cigarettes. At the time this report was prepared the FDA had extended the compliance deadline until August 10, 2017.<sup>[12]</sup> Some research suggests that using e cigarettes containing nicotine is associated with greater smoking cessation than using e cigarettes that don't contain nicotine, and more frequent use of e cigarettes is associated with greater smoking cessation than less frequent use. The FDA has not approved e cigarettes as a quit smoking aid and more research is needed on whether e cigarettes are effective for quitting smoking and to better understand the health effects of e cigarettes. In order for adult smokers to achieve any meaningful health benefits from e cigarettes, they would need to fully switch to e cigarettes and stop smoking cigarettes and other tobacco products completely.

As of September 2019, there have been more than 800 cases of a severe lung disease, including 12 deaths, in the United States. all the affected patients reported previous use of e cigarettes, but there is no confirmed link with an e liquid.



## IN YOUTH

Among youth, e cigarettes are more popular than any traditional tobacco product. There are three reasons e cigarettes may be particularly enticing to young people. First, many teens believe that vaping is less harmful than smoking. Second, e cigarettes have a lower per use cost than traditional cigarettes. Finally, cartridges are often formulated with flavourings such as apple pie and watermelon that appeal to younger users. Indeed between 2017 and 2018, e cigarettes use among America's youth increased by 78%<sup>[13]</sup> some studies suggest that, the wide range of adults are used e cigarettes are primarily for the smoking cessation.<sup>[14,15]</sup>

## IN PREGNANT LADIES

Pregnant women are more interested for smoking cessation by using e cigarettes. Women who smoke have more difficult becoming pregnant and have a higher risk of never becoming pregnant. Smoking during pregnancy can cause tissue damage in the unborn baby, particularly in the lung and brain and they have a link between maternal smoking and cleft lip. mothers who are exposed to second hand smoke while pregnant are more likely to have lower birth weight babies. smoking cessation is the best way to reduces the health problems of babies. Smoking cessation at any point during pregnancy can help. But quitting before week 15 of pregnancy provides the greatest benefits for baby and quitting before third trimester can eliminate much of the potential impact on baby's birth weight.

Very little research exists regarding the safety of using e-cigarettes during pregnancy; however evidence from adult smokers in general suggests that they are likely to be significantly less harmful to a pregnant woman and her baby than continuing to smoke. More research is needed in this area. E-cigarettes do not contain carbon monoxide (CO) or many of the other harmful chemicals found in cigarettes. About 3.6% of pregnant women used e cigarettes while 3.3% of non-pregnant women did.<sup>[16]</sup>

## IN CHILDREN

In adults, some small studies suggest that the use of e cigarettes helps to successful quit effects from the use of tobacco products.<sup>[17,18]</sup> while large studies states that have no large effect for quitting.<sup>[19,20,21]</sup> In 2018, 7.2% of middle school students and 27.1% of high school students reported current use of a tobacco product.

## IN ELDERS

People over age 65 have always been less likely to smoke than adults in general, in part because premature death means fewer smokers survive to older ages. About 18% of all people between 45 and 64 (the highest of all age groups) and around 9% of everyone between 65 and up people are regular smokers.<sup>[22]</sup> Smoking is one of the leading causes of death among senior citizen, often following cancer, cardiovascular diseases and respiratory diseases. It is estimated that 50% of long term smokers will die of smoking related illness.

## IN CANCER PATIENTS

Smoking is the biggest preventable cause of cancer, accounting for 13% of cancer cases per year.<sup>[23]</sup> there is strong evidence that quitting smoking even after a cancer diagnosis can have a huge impact on health. People with cancer who continue to smoke also have a higher risk of developing a second primary cancer or experiencing a cancer recurrence, both of which ultimately contribute to poorer quality of life and poorer survival. E cigarette are more help full for smoking cessation is more likely to be diagnosed with neck or head and thoracic cancer.<sup>[24]</sup>

Some studies suggest that the e cigarettes also contain some toxic substances<sup>[25]</sup> especially formaldehyde<sup>[26]</sup>, reacts with propylene glycol and glycerol and produces some toxic effects. Propylene glycol also irritates upper and lower respiratory tract.<sup>[27]</sup>

## CONCLUSION

E cigarettes usually contain nicotine and may have other harmful substance too. While e cigarettes may be less harm full than regular cigarettes this does not mean that they are harmless. Studies shows e cigarettes are the best method for smoking cessation in any age group, but are not approved by the FDA as smoking cessation aid.

E cigarettes may promote smoking cessation; they may also promote smoking initiation. E cigarettes are safer than cigarettes but are not safe especially in young adults. Smoking cessation counselling, plus the take of e cigarettes can help people quit smoking more successfully than the ones who received counselling but did not use e cigarettes.

## CONFLICT OF INTEREST

The author(s) declared no conflict of interest with respect to the authorship, research or publication of the article.



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