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Abstract: Cigarette smoking is an old tradition in Nepal, but Electronic cigarettes are a recent trend and are powered by a battery. It also contains nicotine, WHO coined the term 'electronic nicotine'. There has been advocacy as a harm reduction method for smokers who prefer an alternative to smoke-free tobacco. Still, it also contains nicotine, which is why it has become a public health concern. The study is based on secondary data published in research journals such as PubMed, Google Scholar, and others. The e-cigarette became modern with its invention in 2003 by Chinese pharmacist Hon Lik. There are indications of it being of use to smokers interested in harm reduction. Still, the spread of its use among young people and the lack of information regarding long-term health outcomes clearly indicate the need to continue surveillance, control, and independent studies.

Keywords: Electronic cigarettes, ENDS, Harm reduction, Tobacco alternatives, Vaping

Declaration: There is no conflict of interest

Introduction

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Electronic cigarettes (EC) are electronic devices powered by a battery and used to heat an aerosolizing liquid solution, which is often made up of nicotine (1). Propylene glycol (PG), glycerol are the common ingredients found in these devices because they are combined with more concentrated flavors and optionally different percentages of nicotine (2). In 2009, the World Health Organization (WHO) coined the term Electronic Nicotine Delivery Systems (ENDS) to elaborate on different categories of e-cigarette devices that contain nicotine (3). The practice of smoking e-cigarettes, popularly known as vaping, has gained significant popularity amongst smokers and nonsmokers worldwide (4). There has been advocacy as a harm reduction method for smokers who prefer an alternative to smoke-free tobacco (2). Certain studies demonstrate that ECs can have lower levels of toxic compounds and less Fine PM distribution than a regular cigarette, because ECs do not entail a high-temperature burning procedure (5). The increasing use of e-cigarettes, especially among young people, has been of great concern to the masses regarding public health. This highlights the importance of deepening research and regulatory policies on them in order to evaluate their possible danger and advantages.

Methods

In August 2025, a specific literature review and module-based synthesis was carried out. Publications were found by the search in PubMed, Science Direct, Google Scholar, and other appropriate academic resources with the keywords such as the following: electronics cigarettes, ENDS, e-cigarette development, cigalike, pod mod, and nicotine delivery. The sources were selected based on publications written in English between 2014 and 2024, and previous historical data or patent entries were added to give an insight into the early history of the development of these products. The focus of the review was on two primary areas, chronological progression and generational modularization of the e-cigarette device systems, and technical characteristics relating to their effect on delivering nicotine and creation of aerosol composition. The collected data underwent some organization and summary in thematic sections that presented the data clearly.

Results

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Historical Development of Device Modules: Early devices were developed when Joseph Robinson invented the first electric vaporizer in the year 1927. Others, such as Herbert Gilbert and Jed Rose, invented nicotine fixes that made use of refined smoke (6). Despite tobacco companies working on devices to generate nicotine aerosol as early as 1963, the e-cigarette became modern with its invention in 2003 by Chinese pharmacist Hon Lik. In the year 2004, the father of Hon Lik died of lung cancer. Hon himself was a smoker who smoked a pack to two regularly. The reason his father died became the primary factor that shifted him to create e-cigarettes (7).

The first generation e-cigarettes are also known as ciga-likes because it is usually like a cigarette in form and size; the first generation of e-cigarettes is also disposable since the liquid cannot be topped up and the battery is not rechargeable (8). People have been applying these products to quit smoking or to replace the traditional cigarette (2). The second-generation devices tend to resemble a pen and have more sophisticated, rechargeable batteries that allow the use of refillable liquid cartridges (8). Third-generation devices, also referred to as mods, are bigger in size and enable one to adjust most of their properties, such as the power of the devices and heating temperature (8). The elevated voltages produce elevated temperatures and consequently quicken the provision of nicotine (9). The latest version of e-cigarettes, pod-based, is lower in size than other varieties and is distinct in that it has a disposable or refillable “pod” which holds the heating coil and the liquid, which is much heavier in nicotine levels than other e-cigarettes (8).

Technical Implications: The electronic cigarettes represent a type of tobacco product that produces an aerosol containing nicotine through heating a liquid and vaporizing it (10). The elevated voltages produce elevated temperatures and consequently quicken the provision of nicotine (9). The newer generation EC devices that produce more energy to the atomizer are apparently more effective than the first generation goods in nicotine delivery to the user and in curbing the craving for nicotine (11). Toxicological studies indicate that e-cigarettes may be

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safer than regular cigarettes, although people have reported adverse outcomes of using e-cigarettes in the short term (12).

Conclusion

The history of electronic cigarettes can be traced back to early concepts of vaporization in the middle of the 20th century, and more recently to small pod-based systems in the modern era, which contain high-nicotine products. Technological advancements with each generation of devices have changed the efficiency of nicotine delivery, the user experience and the aerosol composition, e.g. cigalikes, pen-style tanks, mods and pods. Although e-cigarettes were reported to decrease the exposure to the harmful products of combustion, relative to traditional cigarettes, technical considerations like power settings, e-liquid compositions can affect toxicant emissions and nicotine exposure. There are indications of it being of use to smokers interested in harm reduction, but the spread of its use among young people and lack of information regarding long-term health outcomes clearly indicate the need to continue surveillance, control and independent studies.

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