




Enhancing the Community Health through Restricting Electronic Cigarettes

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Abstract

Smoking electronic cigarettes have become the subject of considerable debate among scientists, with its proponents claiming that it has a benefit for smoking cessation, since its drawbacks are much lower compared to conventional cigarettes. Moreover, proponents believe that electronic cigarettes can be used as nicotine replacement therapies to mitigate tobacco withdrawal syndrome and are the best choice for asthmatic smokers who cannot quit to smoke. However, the opponents argue that electronic cigarettes have numerous negative effects on people, especially the impacts of chemical substances (including fine and ultrafine particles), its role to undermine tobacco control, and its influences on the ex-smokers or even non-smokers to start smoking. This essay will assess to assess the hazards of electronic cigarette use and its impacts on public health. First, it will discuss the potential hazards generated using e-cigarettes over a long exposure, including the adverse effects, followed by the drawbacks of e-cigarettes use on public health related to tobacco control and the decrease of people's awareness.

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Introduction

Over the past decades, scientists have proved the hazards of smoking conventional cigarettes on health, and subsequently, the use of tobacco cigarettes has been restricted by governments. In some countries, smokers have had a limited access to cigarettes and have increased the awareness of using them in daily life due to the hazards. Some smokers have no big obstacle to quitting smoking without any withdrawal syndrome, while others need something to use as a substitute for the cigarettes. Because of the dangers of smoking, in the early 2000s, people were introduced to a new device, called the electronic cigarette, by a Chinese pharmacologist, Hon Lik. He invented a new device that can be used for delivering an aerosol generated by heating a solution, with or without nicotine, and without the combustion of tobacco [1].

Since e-cigarettes have been advertised widely as a safer alternative with or without nicotine for smokers, the smokers using e-cigarettes have multiplied recently. The Action on Smoking and Health (2014) reported that the percentage of e-cigarette users in Great Britain has increased dramatically from 8.2% in 2010 to 30.6% in 2014 [2].

Smoking electronic cigarettes, however, have become the subject of considerable debate among scientists, with its proponents claiming that it has a benefit for smoking cessation, since its drawbacks are much lower compared to conventional cigarettes. Moreover, proponents believe that electronic cigarettes can be used as nicotine replacement therapies (NTRs) to mitigate tobacco withdrawal syndrome and are the best choice for asthmatic smokers who cannot quit to smoke. However, the opponents argue that electronic cigarettes have numerous negative effects on people, especially the impacts of chemical substances (including fine and ultrafine particles), its role to undermine tobacco control, and its influences on the ex-smokers or even non-smokers to start smoking. Although electronic cigarettes have benefits for smokers, the use of e-cigarettes as an alternative for smokers is hazardous.

This essay will assess to assess the hazards of electronic cigarette use and its impacts on public health. First, it will discuss the potential hazards generated using e-cigarettes over a long exposure, including the adverse effects, followed by the drawbacks of e-cigarettes use on public health related to tobacco control and the decrease of people's awareness.

Potential Hazards of Using E-cigarettes

Containing dangerous substances

The cartridges of e-cigarettes need to be heated to produce vapor. The vapor generated from heating e-cigarettes contains dangerous substances that can harm the users and the bystanders at the same time. International Agency for Research on Cancer (IARC) cited in Goniewicz *et al.* (2013) found four carbonyls (formaldehyde, acetaldehyde, acrolein, and o-methylbenzaldehyde) in all brands except “premium” (one of the e-cigarette brands) without acrolein. Formaldehyde and acetaldehyde are known as carcinogenic agents [3] while acrolein is classified as an irritating agent for lung layers and a predisposition factor for cardiovascular diseases in conventional cigarettes [3].³ When the users exhale the vapor containing these chemical agents, the secondhand smokers are going to inhale it simultaneously. I believe that the effects of inhaling these substances can cause non-communicable diseases such as heart diseases, lung disorders, and cancers over long exposure.

Furthermore, e-cigarettes can also create ultrafine particles that endanger human bodies. Ultrafine particles cause a higher risk of pulmonary and systemic inflammation. The numbers of the ultrafine particles are related to the high level of e-liquid nicotine in a puff. These ultrafine particles, which are in a similar amount compared to the conventional cigarettes, are delivered into the human body through the bloodstream. Zhang *et al.* (2013) analyzed the total of e-cigarette ultrafine particles deposition in the human body and he found that 20–27% of the particles were deposited into organs and the circulation system compared to the conventional cigarettes at about 25–35% [4]. This analysis shows that there was no significant disparity between particles generated by conventional cigarettes and electronic cigarettes, so the long-term exposure of e-cigarettes may also be a risk of causing diseases and deaths.

Nevertheless, asthmatic patients who cannot quit smoking are advised to change from conventional cigarettes to e-cigarettes. Some research claims that switching consumption of tobacco cigarettes to e-cigarettes in asthmatic smokers can reduce the symptoms of asthma. Polosa *et al.* (2014) followed up 18 asthmatic patients from September 2012 to December 2013 every 6 months. They found that the use of e-cigarettes can help asthmatic smokers to reduce cigarette use and to improve the outcome of asthma subsequently [5]. However, the result of this research cannot be generally judged as an evidence base in helping asthmatic patients due to the lack of samples and the length of the study.

Threatening Bystanders

The health consequences of using e-cigarettes will not only be experienced by the users but also the bystanders. The bystanders will inhale the contaminated air that contains many substances and ultrafine particles from e-cigarettes vapor. Schober *et al.* (2013) examined the level of air pollution in a café from three people using e-cigarettes for 2 h, and they found higher level of nicotine, glycerin, seven polycyclic aromatic hydrocarbon, aluminum, and 1,2-propanediol classified as carcinogens by the International Agency for Research on Cancer (IARC) [6]. Moreover, the concentration of ultrafine particles in closed places will increase significantly from 400 particles/1 cm³ to 49.000–88.000 particles/1 cm³ after 2 h. The average number of particles found in one room depends on the type of electronic cigarettes [4].⁴ Therefore, the use of electronic cigarettes has a significant impact on human health, even for a passive user.

Reasons for Restricting the Use of Electronic Cigarettes

Undermining tobacco control

The existence of e-cigarettes has undermined tobacco control since they were launched in 2004. For over three decades, governments have enforced a strict regulation on using conventional cigarettes as it has been ascertained that cigarettes contain hazardous substances. Tobacco cigarettes cannot be smoked in smoke-free area or advertised widely through social media and on the internet, while e-cigarettes have no restricted rules on use in public places. People who use e-cigarettes can easily find e-cigarettes from small shops and smoke them wherever they want without any hesitation of other people around them. In addition, the smokers who disagree with the tobacco control program also use it as a way to circumvent the policies. Grana and Ling (2014) cited in Grana *et al.* (2014) revealed that the reasons users choose e-cigarettes for smoking were because they can be smoked anywhere (88%) and used as a circumvention of clean air policies (71%) [7]. Moreover, e-cigarette ads can be found extensively not only on the internet but also through electronic media such as television and radio. It has been advertised in an attractive way and by famous artists. The advertising plays an important role in the increase in users among school-age adolescents. The Journal of the Center for Disease Control and Prevention (2013) reported that the use of e-cigarettes among students increased more than 2-fold within a year from 2011 to 2012 [8].

Reducing awareness of people

Besides undermining tobacco control, electronic cigarettes potentially change people's attitude toward public health. Even though, the study conducted by Polosa *et al.* (2011) regarding the effect of e-cigarette on smoking reduction and cessation concluded that the number of people consuming conventional tobacco decreased significantly [9], people who have already stopped smoking tend to smoke again because they believe that electronic cigarettes will not harm their health or the environment. Using e-cigarettes, people are likely to taste the same favors as tobacco cigarettes without combustion and are given the same physical sensation associated with smoking gestures. For instance, people will use their hand-to-mouth movement as they use it when smoking a conventional cigarette. Caponnetto *et al.* (2012) concluded that people who have experienced e-cigarettes came with no obstacles to stopping smoking conventional cigarettes because they had an "authentic smoking experience" such as hand-to-mouth action [10]. However, the number of smokers using e-cigarettes along with conventional cigarettes (known as dual users) is still a higher proportion among adults. These dual users do not exactly stop using tobacco cigarettes, but they attempt to use them with e-cigarettes simultaneously. The higher proportion (approximately 1.3 million people) using both conventional and electronic cigarettes reported in Great Britain by Action on Smoking and Health (ASH, 2014). Thus, e-cigarettes will not absolutely reduce the number of tobacco users, instead more dangerous substances to the users using both conventional and electronic cigarettes.

Conclusion

All in all, using e-cigarettes widely as an alternative approach for smokers has some benefits such as helping smokers to reduce tobacco dependence, smoking cessation, and probable choice for asthmatic smokers who cannot quit smoking to reduce the symptoms. However, the drawbacks of e-cigarettes use on public health, health policy, and human health outweigh their benefits. The rigorous studies of the impact of the e-cigarettes are obviously needed to gather strong evidence on using e-cigarettes in the future. In addition, the use of electronic cigarettes needs to be regulated properly by governments to reduce the drawbacks. Although the hazards of electronic cigarettes are still limited, the governments' desire to restrict the use of e-cigarettes is a worth effort

to create a healthy environment and a good lifestyle for the next generation.

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