



# Oral, Cardiovascular and Respiratory Effects of E-cigarettes: Synthesis of Literature

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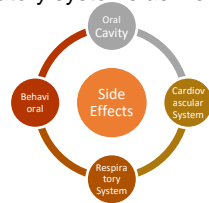


## INTRODUCTION

E-cigarettes were introduced into the tobacco market as a revolutionary product with a net public health benefit. Advertised to adults as an effective smoking cessation aid, e-cigarette sales soared in the U.S., amassing a \$6 billion market value in 2020. Concurrently, these e-cigarettes were being marketed to young adults as a safer, more enjoyable method of smoking. However, there was a lack of available research on the actual benefits from switching to e-cigarettes from conventional cigarettes, and even more importantly on their possible long-term impacts.

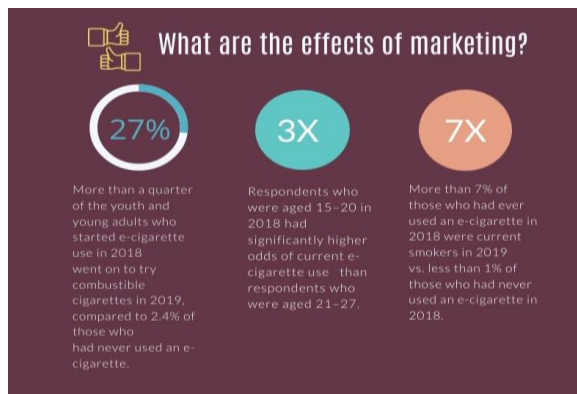
## METHODS

A literature review was completed using PubMed to examine all available articles in the area. The keywords utilized for the article search included “e-cigarettes”, “vaping”, “EVALI”, and “electronic cigarettes”. A total of n=98 research articles were found and reviewed, 57 of which involved experiments conducted on rats and 2 on mice. Most of the studies were conducted in the United States, however some studies were completed outside of the United States. This review focused on behavioral patterns regarding age, and possible side effects involving the cardiovascular and respiratory systems as well as the oral cavity.



## RESULTS

The median age of EVALI survivors was 23 years and the median age of EVALI deaths was 45 years with most cases involving THC-containing products. E-cigarettes contain over 80 compounds, including known toxins. Most e-cigarette products emit these potentially toxic substances in highly variable amounts, with the number of substances and levels emitted varying drastically depending on the product and how it is operated. Due to the relative novelty of e-cigarettes, there is a lack of data on the association of vaping with long-term health effects. However, there was substantial evidence demonstrating the short-term effects of vaping which included: increased heart rate, acute endothelial dysfunction, and oxidative stress. Previously non-smoking young adults and adolescence are more likely to try conventional cigarettes once they use e-cigarettes.



## DISCUSSION

Many of the adverse effects of e-cigarettes including respiratory, oral, and cardiovascular diseases were evident from the current research. Widespread consensus appears to be that certain components of e-cigarettes are hazardous to human health, and thus more research on these topics is required. Further knowledge can help implement more stringent regulations of these products.

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