



## The Effects of E-cigarettes on Health & Safety: A study in Abu Dhabi, United Arab Emirates (UAE)

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### ABSTRACT

*Background and objectives:* Background: Electronic cigarettes are a relatively new form of nicotine delivery devices that have quickly taken over the globe, and the long-term effects of e-cigarettes are still being evaluated. With the recent legalization of vapes and other forms of e-cigarettes in the United Arab Emirates (UAE), the consumers base significantly increased in the region, thus raising many questions for researcher to ask and evaluate. This cross-sectional epidemiological study hypothesizes that e-cigarettes have a negative effect on the health and safety of those who live in Abu Dhabi, UAE. The objectives of this study is to understand the health and safety risks associated with vaping/ smoking E-cigarettes, to measure the strength of association between E-cigarette derived nicotine and change in health status and to find the prevalence of people who have experienced any safety hazards while using e-cigarettes in the UAE. *methods:* Data collected from this paper rely on quantitative methods through self-administered surveys conducted using google docs.. *Results:* The data analyzed from the survey distributed around E-cigarette smokers in Abu Dhabi showed that the prevalence of people who experienced safety hazards while smoking e-cigarettes is 27.9%. The results also showed that there is a positive (0.866) and significant ( $p < 0.001$ ) correlation between nicotine concentration and health changes. *Conclusion:* The evidence and data analyzed from this cross-sectional study indicated that there is a negative effect on the health and safety of E-cigarettes smokers in Abu Dhabi, UAE.

**Keywords:** United Arab Emirates (UAE), Abu Dhabi, electronic cigarettes, nicotine, vaping, smoking, health, safety

### INTRODUCTION

Tobacco cultivation has been identified in 125 countries and is performed in a huge rate to maintain the supply of the resource to the manufacturing organizations 1. E-cigarette or vapes are electronic devices that deliver nicotine to the body by aerosolizing nicotine and releasing vapor that emulates cigarettes smoke. 2

[1-4]. production of e-cigarettes started in china then a development in e-cigarettes engineering have risen at the end of the year 2013. With the advancements in e-cigarettes manufacturing, nicotine levels and their concentrations are controlled, moreover, the variation in liquid solutions and compound. Heating and nicotine conversion is an important factor for users that leads to the creation of different types of E-cigarettes with distinguished characteristics.

E-cigarettes are commonly widespread in the UAE between the younger age group. Due to the legalization of E-cigarettes in the UAE during April of 2019, it became popular among citizens and raised researchers' interests. Research resulted that smoking devices release high concentration of fine particles that is more than what is emitted from regular tobacco smoke. 4

The objectives of this study is to understand the health and safety risks associated with smoking E-cigarettes, to measure the strength of association between E-cigarette derived nicotine and change in health status and to find the prevalence of people

who have experienced any safety hazards while using e-cigarettes in the UAE.

### **E-Cigarettes and Reasons for Vaping**

E-cigarettes are nicotine delivery devices with battery power, which heat flavoring liquid into an aerosol. Users inhale to imitate conventional smoking 5. The main characteristics of e-cigarette users peer influence, heavy smoking, and conventional smokers. Vaping is a less harmful substitute to smoking but an unsafe relative to non-smoking [4-8]. 6 associated socio-economic problems with vaping among never-smoking adolescents leads to inequalities in socio-economic health. The reasons individuals use e-cigarette continue to shift. Miller (2017) 7 analyzed above three million public tweets associated with e-cigarettes. A total of 43% of tweets cited quitting regular smoking as the main objective for vaping in 2012 7. Only 30% of tweets pointed out quitting regular cigarette smoking as the reason for vaping by 2015. Social image accounted for 37% of vaping-linked tweets. Furthermore, beliefs concerning outcomes correlate with e-cigarette use 8. Scholars claim e-cigarettes a breakthrough invention as they replace conventional cigarettes as they are cost-effective, contain different flavors, and easily accessible. 9 Adolescents use e-cigarettes as a sense of fashion, while adults intend to leave combustible cigarettes [8-10]. 10 Surveyed students aged 17-25 years in New Zealand and found 14% were new smokers and 3% were daily smokers. Many students were willing to quit because they did not have a nicotine addiction.

### **E-Cigarette as Smoking Cessation Tool**

Currently, information applicable in supporting or dismissing e-cigarette as a smoking cessation tool is conflicting. Rates of smoking cessation are high in the UK cohort research and studies derived from observations 11. Holistically, the current evidence is limited for conclusive outcomes as there is no definitive data to confirm e-cigarettes facilitating smoking cessation. Students in Eastern and Central Europe who consume e-cigarette had no intention of stopping to vape. 12 Senior students had a high likelihood of declaring the willingness to stop smoking. Experts curbing substance abuse perceive vaping as a health crisis. At least 25% of senior high school students 20% of high school sophomore vaped ones a month. 13 About four million Americans vape products or use e-cigarettes 14.

### **E-cigarettes and Health Effects**

Farsalinos and Polosa 15 indicated electronic cigarettes are less harmful and significant to users interested in switching from tobacco [11-13]. 16 reported 405 different symptoms associated with e-cigarettes in three forums. Notably, 326 were negative, 78 were positive, and one remained neutral. Users had negatives effects on respiratory, digestive, sensory, and neurological systems. E-cigarettes contain variable nicotine contents. Nicotine on labels across brands is from 16 to 48 mg/ml, while the concentrations are from 15.5 to 52.0 mg/ml. 17 The nicotine level in e-cigarette determines the systemic exposure. E-cigarettes have fewer toxicants compared to conventional ones. 18 However, E-cigarette and nicotine exert a high physiological impact on the cardiovascular system and elevate heart rate. 19 Long-term exposure to nicotine concentration causes increased intracellular calcium, leading to cell damage. The cross-sectional survey of adolescents 18-24 years echoes widespread e-cigarette use. The results pointed a vast number of individuals under the perspective e-cigarette are less harmful than tobacco. 20 The prevalence of smoking is still high irrespective of the education campaign for quitting nicotine. The use of e-cigarette and purported health risks were invariable between 2009 and 2014. 21 The reinforcing properties of nicotine influence smoking behavior. 22 The product is affordable and palatable, while its health effects do not cause immediate concerns because they are uncertain and distant. An E-cigarette has low carcinogen levels, but it exposes the user to extensive ultrafine particles. 23 The toxin substantially raises cardiovascular and noncancer lung disease accounting for beyond half of the smoking-linked deaths.

## **METHODS**

This the hypothesis of the study of smoking e-cigarettes have a negative effect on health and safety in Abu Dhabi.

### **Research Questions**

What is the prevalence of smokers who experienced safety hazards in Abu Dhabi, UAE?

What is the strength of association between smoking nicotine containing e-cigarettes and reduced health status in Abu Dhabi, UAE?

### **Study Design**

The study design of this research is an Analytical – Cross sectional epidemiological study.

### **Nature of Sample**

The main criteria for the sample of this study were to be an E-cigarette smoker from Abu Dhabi. The size of the sample is 121 responses. The selection method was randomized through sharing the survey on different social media platforms.

## Data Collection Methods

The data collected from this paper rely on quantitative methods through self-administered surveys conducted using google docs. Results of this survey will be through an inferential analysis to measure the prevalence and strength of association between smoking nicotine containing E-cigarettes and the effect on their health & safety. Findings such as prevalence and association were generated using SPSS.

## RESULTS

### Demographics

The majority of e-cigarette smokers are (males = 62.3%) (Table 1). whereas people aging (31-40) are the highest vapers. Employees are the most smokers with 52%.

**Table. 1** Gender distribution of the sample

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	46	37.7	37.7	37.7
	Male	76	62.3	62.3	100
	total	122	100	100	

### Reasons of Smoking E-Cigarettes

The majority of the sample are individuals who resolved to e-cigarettes as a cessation method with 40.2% of participant

### Frequency of Smoking

According to the data gathered, 40.2% of the set population use their e-cigarette less than 5 times a day, whereas 20.5% use it more than 25 times per day

### Preferred Nicotine Concentration

Based on the survey, the most popular nicotine concentrations among the smokers are 10mg, 50mg, and 25mg in the given order

### Physical Changes

Nearly 30% of the population believe that they experienced negative changes. As indicated from the survey data, the most common negative changes are related to respiratory health. Participants noticed different symptoms such as difficulty in breathing, wheezing, chest pain, coughing and mucus in lungs.

### Safety Issues

The findings of the study show that participants safety was compromised through battery heating by a prevalence of 26.2%, battery explosion by 1.6%

### Level of Consumer`s Awareness

The results indicate that the majority of the participants (Agree = 31.1%, Strongly Agree = 26.2%) claimed to be aware of the side effects of smoking e-cigarettes. Only 12.3% of participants reported that they don't have an adequate level of awareness

### Prevalence of previous tobacco smokers among E-cigarettes smokers

As shown, 68.9% of the population used to smoke conventional cigarettes before smoking e-cigarettes

### Nicotine and health changes

Evidently, there is a positive (0.866) and significant ( $p < 0.001$ ) correlation between nicotine concentration and health changes

## CONCLUSION

In conclusion, the evidence and the data analyzed from this cross-sectional study fail to reject the hypothesis and indicate that there is in fact a negative effect on the health and safety of those who smoke E-cigarettes in Abu Dhabi, UAE. While more research is required to fully estimate the possible side and long-term effects, E-cigarettes are still considered a relatively safer alternative to tobacco cigarettes, and it can be used as method of smoking cessation. However, regulations need to be

implemented to monitor consumption, especially among nonsmokers and the round adults..

#### DECLARATIONS

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##### Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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