

## Original Research Article

### **Citizens' knowledge and attitudes about conventional and e-cigarettes: the role of health care professionals**

#### **Abstract**

**Introduction:** It is true that the comparison of conventional and electronic cigarettes is a topic that has been discussed a lot and concerns both citizens and health professionals worldwide. **The rates of smokers in Greece are high in combination with the fact that smokers are more likely to get seriously ill from covid-19, it was the reason to investigate this topic.**

**Aims:** To investigate the citizens knowledge and attitude about the electronic and conventional cigarette.

**Study design:** It was a comparative descriptive research.

**Place and Duration of Study:** The questionnaires were given to citizens who lived in the prefecture of Achaia (one of the largest prefectures in Greece). The present survey was conducted between March and May 2020.

**Methodology:** A questionnaire was developed with 28 questions. The Chronbach alpha reliability was .75. The sample consisted of 681 citizens. The statistical analysis was performed with SPSS 25 program.

**Results:** The majority of citizens had very good knowledge (57.6%) while 20.3% had good knowledge. Most citizens were non-smoker (64.3%), they did not use electronic cigarette (91%) but they did try in the past (52.3%). Regarding electronic cigarette, they believe that it was not replaced the conventional, was not helpful for quit smoking and it was harmful as much as the conventional one. Finally, the cheaper price of e-cigarette contributes to its choice. Age, permanent residence and educational level significantly correlated with knowledge score ( $p < 0.05$ ).

**Conclusion:** The majority of citizens were non-smokers while the conventional cigarette is still the first preference of the citizens. Although citizens' knowledge of conventional cigarettes and e-cigarettes was very good, it is necessary for health professionals to enrich their knowledge and inform citizens efficiently about smoking.

**Keywords:** Citizens, conventional-electronic cigarettes, health care professionals

## **Introduction**

Smoking is one of the biggest public health problems and a major threat to social well-being internationally, since it has an impact on increasing morbidity and mortality and on the health economy and social productivity.

Nowadays where technology is an integral part of our lives, it is affecting the tobacco industry as well. Modern e-cigarettes have been on the market in recent years, claiming that they are safer for human health than conventional cigarettes. However, research into the safest use of cigarettes is still at an early stage and opinions are controversial. Health professionals need to inform and advise citizens about their negative health consequences for smoking and urge them to quit smoking permanently.

A conventional cigarette is a cylindrical tobacco product that contains small pieces of processed tobacco wrapped in paper. E-cigarettes are electronic devices that heat the liquid and produce an aerosol or mixture of small particles in the air [1]. E-cigarette devices consist of a battery, a tank to hold a containing nicotine, a heating element, or a sprayer and mouthpiece [2]. The fourth generation of e-cigarette includes the pod style that is accompanied by a constant voltage and various charged batteries [3]. Although e-cigarettes are promoted as healthier alternatives to conventional cigarettes, they are not an effective way to fully protect health [4]. Permanent smoking cessation is the most effective way to protect health.

## **Health effects of smoking**

Tobacco consists of a mixture of more than 7,000 different chemicals, with at least 250 of them having proven toxicity or carcinogenic effects [5]. When a person inhales cigarette smoke, the toxic chemicals reach the lungs and immediately circulate in the blood. As a result, smoking damages every organ of the human body and is responsible for more than 19,000 deaths per year in Greece (out of a total of 105,000 deaths) [6]. Regarding pregnancy, the main derivatives of tobacco that are responsible for its adverse effect on the outcome of pregnancy, are carbon monoxide and nicotine [7]. For passive smoking, it has the same harmful chemicals that smokers inhale and there is no safe level of exposure to passive smoke [8]. In addition, nicotine is the substance that is directly related to addiction. Addiction is defined as the pattern of poor adaptation leading to clinically incompetence or disorder [9]. Addiction can be physical (when the body cannot function normally without that substance) and mental (when the user has the need for the substance to maintain mental cohesion).

## **Smoking / e-cigarette statistics**

Nearly 40 million adults in the United States continue to smoke cigarettes, and approximately 4.7 million high school students use at least one tobacco product,

including e-cigarettes [10]. In Greece, the prevalence of smoking is particularly high [11]. According to research in the European Union, Greek participants recorded the highest percentage (40%) in terms of smoking compared to other countries such as Spain (33%), France (28%), Czech Republic (29 %), Great Britain (27%) and Germany (26%), while the lowest incidence was presented by countries such as Portugal (23%) and Sweden (13%) [12]. The frequency of smoking in Greece presents the highest percentages in the ages of 35 - 44 years [12].

Research has shown that 12.6% of all adults had not used an e-cigarette, with the use differing according to gender, age and origin [13]. The percentage of US adults who had tried e-cigarettes since 2018 was about 53%, while women had tried e-cigarettes more than men [14]. In Greece, a recent survey showed that in Athens (capital) 5% of the population uses an electronic cigarette, while 62.2% stated that they have stopped using the conventional cigarette [6]. The same research found that daily use of e-cigarettes can even increase the probability of smoking cessation.

### **The role of health professionals in smoking**

Every health care professional who supports patients that trying to quit smoking, should know the specific vocabulary for this specialized field of health care [15]. Nurses are the largest proportion of health care professionals and their role is to contact effectively and efficiently with patients especially with those in a wide range of socioeconomic status [16].

It is important to mention here that nurses must have a role model through appropriate communication. The nurse creates the appropriate "therapeutic environment" in order to successfully respond to the physical and emotional needs of the patient [17]. The nursing process, as a scientific method of practicing nursing, creates an environment where nurses develops special skills of verbal and non-verbal communication [18]. Moreover, people with mental health often use tobacco as a way to deal with difficulties [19]. Health professionals are able to explain why smoking is harmful and support them to manage in a smoke-free environment.

There is a lack of comparative research studies on electronic and conventional cigarettes in Greece. The purpose of this study was twofold: to assess citizens' knowledge about the two types of cigarettes and secondly to evaluate their attitudes on electronic and conventional cigarettes.

### **Materials and Methods**

It was a comparative descriptive research. Data collection was performed using a questionnaire consisting of a total of 28 questions constructed by the researchers. The questionnaire consisted of three parts: the first part was the knowledge test with ten questions, which were developed from the literature review. Each correct answer had

1 point. So, the minimum score was 0 and the maximum 10. We used the (Greek) academic scale to categorize the score, as follows: 0-4.9 = poor, 5-6 = good, 6.5-8 = very good, 8.5-10 = excellent. The second part of the questionnaire concerned citizens' attitudes on conventional and e-cigarettes and included 10 questions using a 5-point scale from “not at all” to “very much”. Finally, the third part included some demographic questions. The Chronbach alpha reliability index was .75, which was considered satisfactory.

Particular attention was given to the structure of the questionnaire in order for citizens to be easily readable and understandable without the need for specialized knowledge. It is worth noting that the first page includes all the instructions and explanations that the participants need to know as well as issues of confidentiality, anonymity and voluntary participation.

### **Data collection**

The questionnaires were distributed to citizens of the prefecture of Achaia (one of the largest prefectures in Greece). The present survey was conducted between March and May 2020. A total of 681 questionnaires were collected. The time to complete the questionnaire was about 5 minutes.

### **Sampling**

Convenience sampling was used in this study. The research team approached citizens in central locations within the cities (such as squares, café shops, shopping malls) and asked the participants to fill out the questionnaire.

### **Statistical Analysis**

The results were analyzed using the statistical program SPSS 25. A probability value  $p < 0.05$  was chosen for the correlation and the differences in the data analysis. Descriptive analysis was used to describe the samples and parametric analysis (One way ANOVA) was employed to test the existence of statistical differences among the knowledge score and the demographic characteristics.

## **Results**

**Table 1:** Demographic characteristics

|                            |                    |                 |                   |                    |
|----------------------------|--------------------|-----------------|-------------------|--------------------|
| <b>Age</b>                 | 18-77 years        |                 | x=26.10 years     |                    |
| <b>Gender</b>              | Male (35.8%)       |                 | Female (64.2%)    |                    |
| <b>Permanent Residence</b> | Urban area (87.7%) |                 | Rural area (9.8%) | Island area (2.5%) |
| <b>Marital Status</b>      | Single (83.7%)     | Married (14.5%) | Divorced (1.5%)   | Widow (0.3%)       |
| <b>Education</b>           | Primary (3.4%)     | Secondary (28%) | Higher (68.6%)    |                    |

|                      |                     |                           |                           |                 |
|----------------------|---------------------|---------------------------|---------------------------|-----------------|
| <b>Annual Income</b> | <10.000€<br>(42.9%) | 10.001-20.000€<br>(32.6%) | 20.001-40.000€<br>(17.9%) | >40.001€ (6.6%) |
|----------------------|---------------------|---------------------------|---------------------------|-----------------|

The sample age ranged from 18-77 with a mean score of 26.10 years. In addition, 64.2% were women, lived in an urban area (87.7%), were single (83.7%), had graduated from higher education and their annual family income was <€ 10,000.

**Table 2:** Knowledge score

|                  |       |
|------------------|-------|
| <b>Poor</b>      | 5.7%  |
| <b>Good</b>      | 20.3% |
| <b>Very Good</b> | 57.6% |
| <b>Excellent</b> | 16.4% |

The majority of citizens had very good knowledge (57.6%) while 20.3% had good knowledge.

**Table 3:** Citizens opinions for electric and conventional cigarette

|   | Not at all     | Little           | Fairly             | A great deal       | Very much                |
|---|----------------|------------------|--------------------|--------------------|--------------------------|
| E-cigarette replaces the conventional one   | 12.3%          | 34.2%            | 36.9%              | 8.1%               | 8.5%                     |
| E-cigarette help you quit smoking   | 20.1%          | 42.7%            | 23.5%              | 9.5%               | 4.1%                     |
| E-cigarette can make you more addicted to use the conventional cigarette                          | 17.9%          | 33.5%            | 32%                | 12.9%              | 3.7%                     |
| E-cigarette is less harmful than the conventional one   | 20%            | 32.2%            | 33.8%              | 9.3%               | 4.8%                     |
| The cheaper price of e-cigarette contributes to its choice, instead of the conventional cigarette | 14.5%          | 25.8%            | 30.4%              | 18.5%              | 10.7%                    |
| How often have you used an e-cigarette in the last month?   | Daily (6.2%)   | Sometimes (2.2%) |                    | Not at all (41.6%) | I have not smoke (50.1%) |
| You are   | Smoker (25.3%) |                  | Non-smoker (64.3%) |                    | Ex-smoker (10.4%)        |
| Are you an e-cigarette user?  | Yes (9%)       |                  |                    | No (91%)           |                          |

|  |              |            |              |              |            |  |
|--|--------------|------------|--------------|--------------|------------|--|
| <b>Have you tried e-cigarette in the past?</b> | Yes (47.7%)  |            |              | No (52.3%)   |            |  |
| <b>How many cigarettes do you smoke daily?</b> | None (74.6%) | 1-10 (16%) | 11-20 (5.9%) | 21-30 (3.1%) | >30 (0.4%) |  |

Most citizens were non-smoker (64.3%), they did not use electronic cigarette (91%) but they did try in the past (52.3%). Regarding electronic cigarette, they believe that it was not replaced the conventional, was not helpful for quit smoking and it was harmful as much as the conventional one. Finally, the cheaper price of e-cigarette contributes to its choice.

**Table 4:** One-way ANOVA between total score and demographic characteristics.

|                      |                | ANOVA          |     |             |       |             |
|----------------------|----------------|----------------|-----|-------------|-------|-------------|
|                      |                | Sum of Squares | df  | Mean Square | F     | Sig.        |
| Age:                 | Between Groups | 2537,155       | 3   | 845,718     | 8,642 | <b>,000</b> |
|                      | Within Groups  | 66248,854      | 677 | 97,857      |       |             |
|                      | Total          | 68786,009      | 680 |             |       |             |
| Gender:              | Between Groups | 1,471          | 3   | ,490        | 2,141 | ,094        |
|                      | Within Groups  | 155,104        | 677 | ,229        |       |             |
|                      | Total          | 156,576        | 680 |             |       |             |
| Permanent residence: | Between Groups | 1,325          | 3   | ,442        | 2,519 | <b>,047</b> |
|                      | Within Groups  | 118,696        | 677 | ,175        |       |             |
|                      | Total          | 120,021        | 680 |             |       |             |
| Marital status:      | Between Groups | 1,177          | 3   | ,392        | 1,998 | ,113        |
|                      | Within Groups  | 132,879        | 677 | ,196        |       |             |
|                      | Total          | 134,056        | 680 |             |       |             |
| Educational level:   | Between Groups | 1,947          | 3   | ,649        | 2,213 | <b>,045</b> |
|                      | Within Groups  | 198,573        | 677 | ,293        |       |             |
|                      | Total          | 200,520        | 680 |             |       |             |
| Annual income:       | Between Groups | 3,087          | 3   | 1,029       | 1,198 | ,310        |
|                      | Within Groups  | 581,515        | 677 | ,859        |       |             |
|                      | Total          | 584,602        | 680 |             |       |             |

Age, permanent residence and educational level significantly correlated with knowledge score ( $p < 0.05$ ).

## Discussion

Smoking as a health issue concerns not only Greece but also most countries internationally. Both conventional and electronic cigarettes have negative effects on health. Nowadays, although there is a lot of information about the negative consequences of smoking, this does not discourage smokers. Since addiction from conventional and e-cigarette are not differentiated on the basis of gender, age, race or social and economic status, the nurses role should be focused on both prevention and treatment [20].

The main reasons that people smoke is the lack of information about the damage that may cause to their health [21]. Moreover, the technological development of cigarettes and their promotion has led to their addiction. It is true that the issue of conventional and e-cigarettes is an up-to-date topic that concerns both society and public health. The present study found that the majority of the sample (64.3%) are non-smokers. In order to continue these “promising” rates in the community, more emphasis needs to be placed on prevention. There is an urgent need for health professionals to record patient's history on smoking, to recommend smoking cessation, mobilizing citizens through counseling that will focus on the harmful effects of smoking to health.

In addition, the present research revealed that citizens' knowledge of conventional and e-cigarettes was very good. It seems that the information, combined with the economic crisis in Greece and the increasing cost of cigarettes, are factors that led to their avoidance of smoking. In addition, community nursing can and should continue to play an important role in informing and educating citizens. Community nurses must organize regular activities and inform citizens about smoking through brochures or presentations. Moreover, the contribution of school nurses should be emphasized more because through educational programs are informed not only children and parents but also the school teachers [22]. Last but not least, media has also an important role to play [23], by providing the appropriate time to health professionals so that they will inform about smoking and the harmful effects on human health.

Furthermore, citizens' knowledge is significantly correlated with age, permanent residence and educational level ( $p < 0.05$ ). More precisely, the present research has shown that older citizens scored better on the knowledge test. This may be due to the experience they had as smokers and therefore they were more informed. Also, citizens living in urban areas had more knowledge than citizens living in rural or island areas. It seems that activities related on health issues are more frequent in urban areas and therefore citizens have the opportunity to attend. Moreover, citizens who had graduated from higher education had a higher score on the knowledge test. It is generally accepted that universities are required to provide the information, guidance, education and supervision necessary to ensure the students health [24]. Within these goals the universities have provided all the necessary actions (health and safety regulations, information guides) in order to ensure and promote the student's health.

Finally, it is noteworthy that citizens believe that the e-cigarette was not safer than the conventional one. Although e-cigarettes are promoted as safer than conventional

cigarettes, the present study revealed that people are not convinced by this argument. Citizens consider e-cigarettes to be as harmful as conventional ones (52.2%), since it is addictive and there is doubt about the safety of e-cigarettes. The present research has also shown that e-cigarettes do not help to quit smoking. The literature also provides similar results [25].

### **Limitations**

The main limitation of the present study was the small sample size and contingent selection. Although the research provided important data on Greek citizens knowledge and attitudes about the electronic and conventional cigarette, it is necessary to use a larger sample from more cities as to compare finding on a greater scale. Another limitation is the fact that most citizens were non-smoker and as a result their answers might be viewed with caution.

### **Conclusions**

The research found that citizens had very good knowledge about electronic and conventional cigarettes. In addition, citizens believe that the e-cigarette does not replace the conventional one and help them “little” to quit smoking. At the same time, they consider that the use of e-cigarette is as harmful as the conventional one, while the cheaper price of the e-cigarette, in relation to the conventional one, contributes to its choice. The present research will raise concerns about conventional and e-cigarettes among citizens and will lead researchers for conducting more research on this topic. Finally, it is important for all health professionals to be properly informed in order to educate citizens with the ultimate goal to combat and eliminate smoking issues.

### **Ethical Approval:**

The study received ethical approval by the institutional review board of the University of Patras (Greek registration number: 2735).

### **Consent**

As per international standard or university standard, patients’ written consent has been collected and preserved by the author(s).

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