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Research Article

# Differences in Awareness Levels of E-cigarette Use among Adolescents in Riyadh City

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**Abstract**: Results: The obtained results showed that the average scores for awareness and thoughts on the use of e-cigarettes among students were 4.02 and 3.43, respectively. The average score for emotions after using e-cigarettes was 3.25. In the field of after-reflection, the arithmetic mean values were notably high. The highest arithmetic mean value of 4.37 secured first place, while paragraph 3 followed closely behind which states "I think the use of cigarettes causes problems for the environment," acquired the lowest arithmetic mean value of 3.73 and ranked last, while the overall arithmetic mean was 4.02. There were no significant differences observed based on age, place of residence, or economic status. However, differences were found when considering educational level, specifically between secondary, university, and postgraduate studies. Notably, statistically significant differences were observed in favour of the secondary category in terms of the use of electronic cigarettes. Conclusion: The study's findings suggest that there is a significant level of awareness regarding the use of electronic cigarettes among the target group, particularly adolescents. This underscores the importance of this developmental stage in fostering the adoption of healthy habits that can have long-lasting effects. One of the crucial stages in the development of human health behaviours is highlighted, with a particular emphasis on the avoidance of smoking.

**Keywords**: Awareness Levels of E-Cigarette Use, Adolescents.

## 1. Introduction of the Study

Recent technological advancements and revolutions have brought numerous benefits to individuals. However, it is important to acknowledge that every factor has its drawbacks. This includes the evolution of atomizers, such as e-cigarettes [1]. The rapid advancement and innovation in the chemical composition of addictive materials such as e-cigarettes, vapes, and cigarettes have been extensively discussed. These materials are constantly being upgraded to meet new demands and incorporate new enhancements [2]. The tobacco and e-cigarette industries have experienced significant growth and sales due to the widespread adoption and usage of e-cigarettes. In Saudi Arabia, the estimated daily smoking rate is 16.13%, which is cause for concern [3]. Presented below is an image depicting the estimated prevalence of smoking in Saudi Arabia:

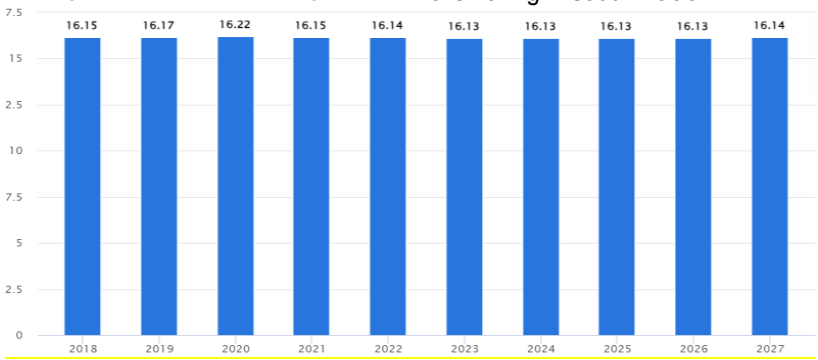


**Figure 1**: The Estimates Smoking Level Per Day.



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Furthermore, a comprehensive review has found that Arabian countries have the highest usage rates of e-cigarettes. The study also suggests that the population is shifting away from traditional smoking and turning to e-cigarettes as a safer and less harmful alternative to addiction. It further highlights that this trend is most prevalent among younger individuals i.e., adolescents [4]. Additional research has provided insight into the concerning rise of e-cigarette use among young individuals. A recent study examined a significant sample size of 3375 participants, who were both e-cigarette and regular cigarette users. Surprisingly, the study revealed that most of these users fell within the 18-24 age range, indicating a high prevalence of e-cigarette use among adolescents in Saudi Arabia [5].

A recent study has focused on the prevalence of e-cigarette use among young people in Saudi Arabia. The findings indicate that a significant number of individuals in the younger age group, particularly those aged 18 and above, have a limited understanding of the addictive nature of these substances. This lack of awareness contributes to the development of negative habits, as people perceive e-cigarette use as a form of entertainment [5]. It is important to address the issue of e-cigarette addiction among students and adolescents in Saudi Arabia. There is a pressing need for education and awareness about the consequences of using e-cigarettes. Currently, there is a lack of awareness among students regarding the risks associated with e-cigarettes [6]. To protect the younger generation from harmful habits and emphasise the importance of awareness and education among students and adolescents, this study aims to highlight the significance of understanding the use of e-cigarettes. The researcher has provided a clear depiction of the main aim of the study.

- To assess the awareness level of adolescents in the education sector regarding e-cigarettes.
- To clarify the influence of other broad demographic factors on adolescents' knowledge of consumption.

The study has employed a quantitative survey-based approach to address the objectives. Primary data was collected from the educational sector. The study aims to make significant and novel contributions to the literature and the practical field. This study aims to offer valuable insights into the importance and significance of raising awareness and providing education to prevent the younger generation from adopting the detrimental habit of e-cigarette use. This study aims to provide valuable insights for policymakers, educational institute management, and guardians of adolescents. By promoting awareness and education, these stakeholders can effectively contribute to the well-being and safety of the future workforce.

The study has been revised in the sections covering the literature review, research methodology, computed results, and their interpretation, as well as the discussion and conclusion.

## 2. Literature Review

Adolescence is a critical phase of development during which individuals establish important lifelong habits. This stage is particularly influential in shaping various health behaviours, with a particular emphasis on the avoidance of smoking. Also, it is worth noting that habits developed during adolescence can have a lasting impact into adulthood. Furthermore, the prevalence of tobacco use among adolescents is constantly evolving, with a noticeable decline in the consumption of combustible cigarettes. However, there has been a notable rise in the use of electronic cigarettes and other devices for nicotine delivery. It is crucial to address and mitigate these detrimental behaviours among young individuals to minimise the likelihood of developing preventable chronic illnesses in the future [7]. The prevalence of e-cigarette use has become widespread, particularly among adolescents aged 12 to 16, across all nations. In 2018, there were 58.1 million e-cigarette users globally, and this number rose to 68 million in 2020. Furthermore, research indicates that the prevalence of e-cigarette usage worldwide stood at 9.8% within the previous month. Furthermore, the prevalence of these cigarettes differs across countries.

However, it is worth noting that e-cigarette usage is more common among young individuals compared to the general population. In the United States, for instance, the prevalence of e-cigarette uses in 2020 was 5.1% among the general population, while it stood at 11.9% among young people aged 18-24 years. Similarly, in China, the prevalence was 1.5% among the general population and 2.9% among young people aged 15-24 years in 2018. In Canada, the figures were 2.3% for the general population and 6.3% for young people aged 15-19 years in 2017. It is concerning that there is a high prevalence of e-cigarette use among 15-17-year-olds in the United States (14.1%) [8]. Additionally, there is a growing disparity in health outcomes related to e-cigarette use, particularly among adolescents. The perception of e-cigarette harm and addiction is crucial in studying smoking behaviours and adolescent use of these products [9]. There has been a concerning rise in the use of e-cigarettes among young people, particularly students. This trend is directly associated with negative impacts on public health and its decline [10].

Furthermore, there is a growing trend among adolescents, including those who are still in their childhood years, to engage in the use of e-cigarettes. Through a comprehensive analysis of parental e-cigarette use in Saudi Arabia, it was discovered that the long-term smoking habits of parents have had a significant impact on the knowledge and awareness of children and youth regarding the associated laws and health risks [11]. Many individuals turn to e-cigarettes to quit smoking due to the perception that they are less detrimental to health compared to conventional cigarettes [6]. In the United Kingdom, it is illegal to sell e-cigarettes containing nicotine or tobacco to individuals under 18 years of age. This also applies to the sale of tobacco cigars [12].

E-cigarettes use carriers that contain nicotine, which are flavoured e-liquids combined with a solution of glycerine or propylene glycol. There are various types of e-cigarettes available, apart from electronic tubes and e-cigars. These include electronic nicotine and non-nicotine electronic delivery systems. Cigarettes typically contain various harmful components, including nicotine, which can have detrimental effects on both the smoker and those exposed to the resulting aerosols [13]. Furthermore, cigarettes play a role in the production of aerosols by heating a liquid that contains various harmful compounds, including flavourings, nicotine, and other chemicals. These components disperse and contribute to the formation and escalation of aerosol levels [13]. E-cigarettes use a substance called e-liquid, also referred to as e-juice or vape juice. When people use these cigarettes, they inhale the mist they produce, which then enters their lungs. Likewise, e-cigarettes have the potential to be used as a means of administering illicit substances, including drugs and marijuana, which pose a greater risk.

Therefore, the aerosols emitted by these cigarettes can pose health risks to both users and those in proximity, as they introduce harmful substances into the lungs. There are a limited number of studies on e-cigarettes in the Middle East, as

indicated by national estimates of e-cigarette use. As an illustration, a study carried out in Jordan revealed that 11.7% of adults were found to be using e-cigarettes [8] the prevalence of e-cigarette usage has rapidly increased, particularly among youth in various countries, with the United States being a notable example. In line with the data provided by McMillen [14], the prevalence of adult e-cigarette use experienced a significant increase from 1.8% in 2010 to 13% in 2013. Similarly, the rate of current e-cigarette use rose from 0.3% to 6.8% during the same period. In 2016, the prevalence of cigarette use among adults in the United States was 15.3% for ever-use and 3.2% for current use [15]. According to Dai and Leventhal [15], the rate of e-cigarette uses among individuals aged 18-24 was higher than that of all other age groups.

In Asian countries, the use of e-cigarettes was less common compared to Western countries. In China, the rate of permanent and current e-cigarette use among 15-year-old residents was 3.1% and 0.5%, respectively, in 2015. In Hong Kong, the current use rate was 0.7%, and the previous use rate was 0.2% among the population. In Taiwan, 2.7% of the population had tried e-cigarettes [15]. The surge in young e-cigarette users in Asian countries can be attributed to their association with positive health behaviour theories. These theories include harm reduction, addiction reduction, and increased social acceptance. The influence of positive perceptions on people's behaviours, particularly in relation to health, is highlighted by the health belief model [16]. China has recently taken notice of the growing popularity of e-cigarettes among young people and has implemented a series of policies to combat the rise in youth vaping. These measures aim to study the behaviours and attitudes surrounding the use of e-cigarettes by young individuals, as well as gain a better understanding of their experiences and opinions towards these products. These efforts are part of a broader set of regulations aimed at controlling the spread of e-cigarettes among youth [17].

Concerns surrounding e-cigarettes and their impact on public health have been the subject of study. The percentage of individuals holding these concerns ranged from 36% to 60.8% [8]. A study examined the influence of racial disparities and socioeconomic status on American adolescents' perceptions of the harm and addiction associated with e-cigarettes. The findings revealed that these disparities have an impact on how adolescents perceive the risks and addictive nature of e-cigarettes [9]. Additionally, Alsanea [18] conducted a study to assess the knowledge, awareness, attitudes, and perceptions surrounding e-cigarettes among students of dentistry, pharmacy, and nursing. Significant findings revealed that most students held misconceptions regarding e-cigarettes, such as their potential as smoking cessation aids. Additionally, the students exhibited a limited understanding of e-cigarettes [18]. A study was conducted to assess parents' awareness of e-cigarette use and the effects of their smoking on their teenage children in Saudi Arabia. The study revealed significant findings. It was found that 61.7% of the parents were smokers, and 13.3% of them reported their children using e-cigarettes.

Interestingly, parents who smoked were more accepting of their teenage children using e-cigarettes. Moreover, it was observed that mothers who smoked were more accepting of their children's e-cigarette use compared to fathers [11]. Sabbagh [11] conducted a study to assess the students at Jazan University in Saudi Arabia's awareness, knowledge, perception, and use of e-cigarettes. The study findings revealed that 21.0% of individuals reported using e-cigarettes, with 35.1% of them using these devices to quit smoking. Additionally, 50% of the participants expressed the belief that e-cigarettes were equally addictive as cigars [11]. A study conducted in Nigeria focused on the correlation between tobacco and e-cigarette use among young people and adolescents. The research revealed several factors that contribute to the likelihood of using these substances in this demographic. These factors include socio-demographic characteristics, family social support, and health status, specifically the presence of severe anxiety and stress [19]. A study conducted in Hong Kong revealed a collection of perceptions regarding e-cigarettes and the perceived harm associated with addiction to them. Key perceptions included: E-cigarettes are widely recognised as being less harmful and addictive compared to traditional cigarettes. They have gained popularity among young people, although it is worth noting that smokers are the ones most likely to report any negative effects associated with using e-cigarettes and their aerosols [20].

The use of e-cigarettes in supermarkets has increased, according to a study by Parnham [12] in Britain. In 2018, they were found in 57.4% of supermarkets, and by 2022, this number had increased to 66.5%. There seems to be a growing interest in e-cigarettes among various age groups, particularly young adults, and adolescents [12]. A study was conducted using the Global Adult Tobacco Survey (GATS) and involved 14 countries. The purpose was to assess their understanding and awareness of e-cigarette usage. Key findings include the higher awareness of e-cigarette use in Greek society compared to India, as well as the absence of significant gender differences in most selected countries, except for Indonesia, the Philippines, Malaysia, and Russia (Kundu et al., 2023). Also, a study conducted in China has confirmed that the factors contributing to the increase in e-cigarette usage include peer influence, exposure to advertisements promoting these products, and concurrent tobacco smoking [21].

The use of e-cigarettes by adolescents is widely recognised as detrimental to their health and a significant health concern. It is crucial to fully grasp and analyse this issue to determine the key elements required for creating effective preventive measures. There are several factors linked to the use of e-cigarettes, including knowledge and perception, socio-demographic factors, influence from peers and parents, traumatic childhood experiences, and drug abuse. To address these factors, various interventions, such as programmes, policies, and laws, should be implemented to cater to the needs of adolescents, who are considered the most vulnerable group when it comes to smoking and cigarette abuse [7].

## 3. Methods

### *3.1 Study Design, Sample, and Data Collection*

The study was conducted using a quantitative approach. In this approach, the researcher has utilised a survey tool to collect primary data. The researcher has formulated the aim of evaluating the awareness levels among adolescents. To gather data, the researcher has focused on the educational sector, as students in their adolescence form the core population of educational institutions.

The researcher has specifically focused on gathering data from secondary, university, and graduate-level adolescents. The selection of the mentioned institutes was made to ensure that the data collected would be representative and diverse. The

researcher employed the convenience sampling technique due to the unknown sample size, necessitating a specific approach for accessing the respondents, which was the method mentioned. The researcher has employed a combination of self-administered and online methods for data collection to validate the specified criteria among adolescents and to include participants who are located far away from the study site.

A sample of 544 participants was selected from university and secondary school students in the city of Riyadh. The collected sample was evaluated using the software SPSS for quantitative analysis. The participants' ages varied between 17 and 22 years, with an average age of 1.92. Their educational backgrounds ranged from secondary school to university and postgraduate studies, with an average level of education of 1.99. In terms of residence, they were from various locations, including the north centre, the southwest of Riyadh, and a village, with an average residence score of 1.76. Their economic income ranged from 5,000 to over 10,000 thousand riyals, with an average income score of 2.26. They satisfied the specified criteria: Engagement 1. The participant should be a student currently enrolled in one of the mentioned universities. 2. The participant willingly agreed to answer the study questions after being fully informed. The researcher used this consent form to ensure that ethical considerations were adhered to during the research process. In addition, the researcher has taken measures to ensure voluntary participation, trust, and confidentiality. As illustrated in Figure 1, the distribution of study subjects based on the demographic study variables is presented.

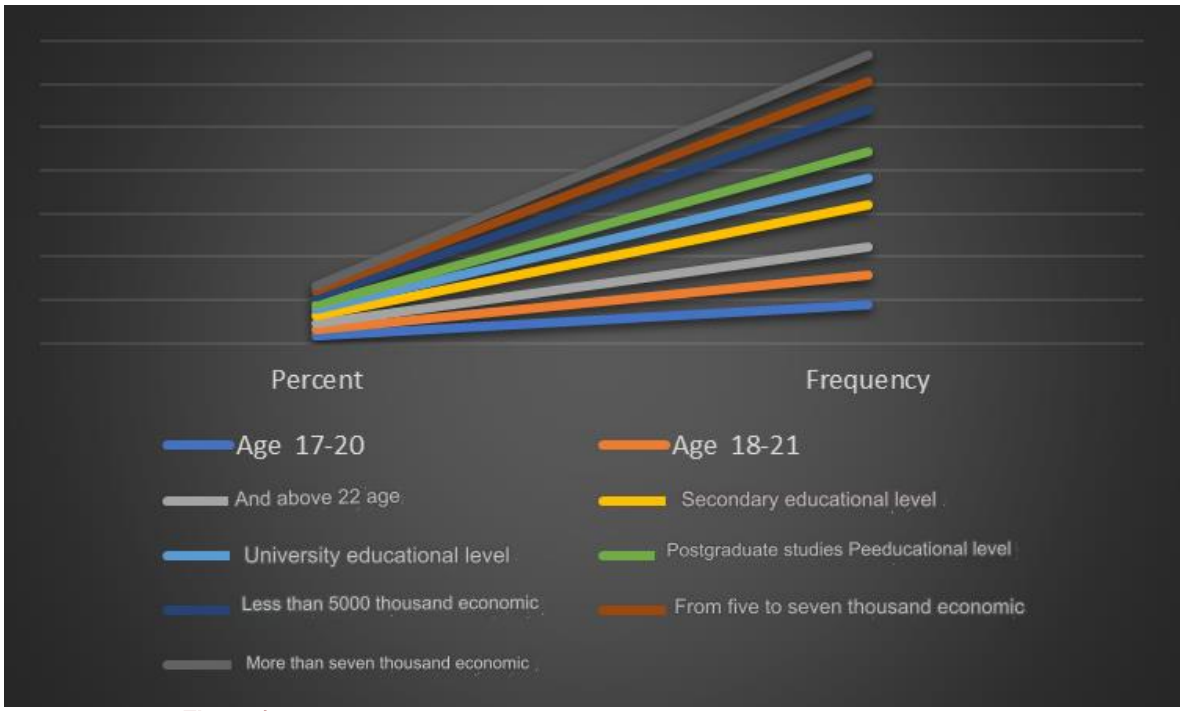


Figure 1: Shows the Study Subjects According to the Demographic Variables.

## 4. Questionnaire Design

The researcher developed the questionnaire using a traditional method of questionnaire design. The researcher introduced the research, including background information, a brief overview of the researcher's background, and a prelude to the purpose of data collection. The nest incorporated demographical variables such as age, economic level, education, and place of residence. In the third part, Trumbo (2018) developed the Awareness Scale for the Use of Electronic Cigarettes, which includes 17 items across three dimensions. 1. Reflection is typically represented by paragraphs in descending order (5, 4, 3, 2, 1). 2). Emotion is conveyed through phrases 6, 7, 8, 9, and 10. 3. 3). Following the presentation of knowledge or information in paragraphs (17, 16, 15, 14, 13, 12, 11), the scale is assessed using a pentagram Likert scale, with ratings ranging from 0 (never) to 4 (almost always). A calculation was performed to determine the correlation coefficient between the scores of each paragraph and the total score of the corresponding field. We calculated the correlation coefficients between the scores of each domain of the resolution and the total resolution score. Table 1 demonstrates this concept.

Table 1: Pearson's Correlation Coefficients Between the Domains of the E-Cigarette Awareness Scale and the Instrument

| Dimension | After thinking | After passion | After knowledge | E-cigarette awareness scale |
|---|---|---|---|---|
| After thinking | 1 | | | |
| After passion | .488** | 1 | | |
| After knowledge | .495** | .536** | 1 | |
| E-cigarette awareness scale | .799** | .855** | .798** | 1 |

**Statistically significant at the significance level (0.01).

Table 1 displays the correlation coefficients between the fields of a study tool and the A tool. The correlation coefficients for the fields of the study tool were found to be greater than 0.20, which aligns with the objectives of this study. Table 2 displays the Pearson's correlation coefficients that were calculated between the paragraphs of the tool and the corresponding domains. The correlation coefficients between the paragraphs and the tool can be examined.

Table 2: Values of Correlation Coefficients Between the Paragraphs of Each Domain with Its Domain and the Tool (total).

| Paragraph | Association with After thinking | | Paragraph | Correlation with the dimension of Emotion | | Paragraph | Correlation with the dimension of knowledge | |
|---|---|---|---|---|---|---|---|---|
| | Dimension | Overall tool | | Dimension | Overall tool | | Dimension | Overall tool |
| 1 | .605** | .566** | 6 | .800** | .666** | 11 | .630** | .484** |
| 2 | .734** | .519** | 7 | .758** | .628** | 12 | .624** | .527** |
| 3 | .687** | .551** | 8 | .762** | .680** | 13 | .560** | .353** |
| 4 | .696** | .608** | 9 | .702** | .626** | 14 | .610** | .518** |
| 5 | .757** | .560** | 10 | .769** | .644** | | | |

**Statistically significant at the significance level (0.01).

Table 2 demonstrates that the correlation coefficients between the paragraphs of the tool, the field of study, and the total tool were deemed appropriate. The correlations between the paragraphs of the tool and the fields of study and the total tool exceeded 0.20, indicating acceptable and statistically significant degrees that aligned with the study's objectives. Therefore, none of the paragraphs on the scale have been removed. The Cronbach's alpha coefficients for the dimensions of the scale were 0.92, 0.90, and 0.93, respectively.

## 5. Results

### *5.1 Awareness levels of e-cigarette use among adolescents using e-cigarettes.*

Table 3: Arithmetic Averages and Standard Deviations of Study Sample Estimates on the Domains of E-Cigarette Awareness Scale Levels in Adolescents Using E-Cigarettes.

| Number Paragraph | Rank | Paragraph | Total | Deviation Normative | Level |
|---|---|---|---|---|---|
| 1 | 1 | After thinking | 4.02 | .95 | big |
| 3 | 2 | After knowledge | 3.43 | .84 | big |
| 2 | 3 | After passion | 3.25 | 1.15 | medium |
| | | E-cigarette awareness scale | 3.57 | .80 | big |

The data from Table 3 reveals that the paragraphs of the scale had high arithmetic averages. The average for thinking was the highest (4.02), knowledge came in second (3.43), and emotion came in last (3.25).

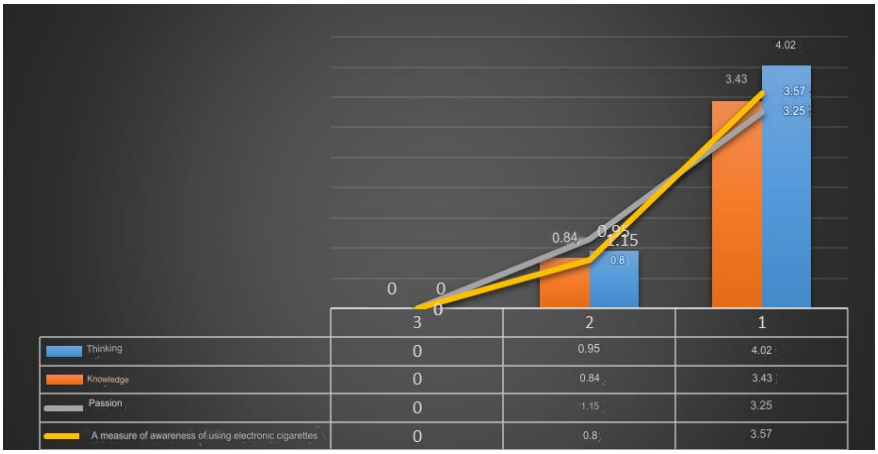


Figure 2: Shows the Arithmetic and Deviations of All Dimensions of the Levels of the E-Cigarette Awareness Scale.

The arithmetic averages and deviations of all dimensions of the Levels of the E-Cigarette Awareness Scale in Adolescents Using E-Cigarettes Were Calculated in the Following Manner.

### *5.2 First: Thinking Dimension*

Table 4: Arithmetic Averages and Standard Deviations of Estimates of study Sample Members on the Thinking Dimension.

| M | Rank | Paragraph | Arithmetic mean | Deviation Normative | Level |
|---|---|---|---|---|---|
| 1 | 1 | I believe that the use of e-cigarettes can pose a threat to the future generation. | 4.37 | 1.07 | big |
| 4 | 2 | I think the dangers of e-cigarettes are increasing right now. | 4.03 | 1.39 | big |
| 2 | 3 | I believe that the use of e-cigarettes causes health problems. | 3.99 | 1.49 | big |
| 5 | 4 | I think e-cigarettes are risky because they rely on unnatural ingredients. | 3.98 | 1.39 | big |
| 3 | 5 | I believe that the use of e-cigarettes causes environmental problems. | 3.73 | 1.44 | big |
| | | After thinking | 4.02 | .95 | big |

The data in Table 4 reveals that the paragraphs in the field of reflection had high arithmetic averages. Paragraph (1), expressing concern about the impact of e-cigarettes on future generations, had the highest average (4.37). On the other hand, paragraph (3), discussing the environmental issues associated with e-cigarette use, had the lowest average (3.73). The overall average for the paragraphs was 4.02.

### *5.3 Second: Emotion Dimension*

**Table 5**: Arithmetic Averages and Standard Deviations of Estimates from the Study

| M | Rank | Paragraph | Average | Deviation Normative | Level |
|---|---|---|---|---|---|
| 4 | 1 | I feel sad for myself when I think about using e-cigarettes. | 3.59 | 1.46 | big |
| 1 | 2 | I feel dread/dread at the thought of using e-cigarettes. | 3.22 | 1.51 | medium |
| 2 | 3 | I get scared when thinking about using e-cigarettes. | 3.18 | 1.56 | medium |
| 5 | 4 | I get angry when thinking about using e-cigarettes. | 3.13 | 1.51 | medium |
| 3 | 5 | I get concerned when thinking about using e-cigarettes. | 3.12 | 1.53 | medium |
| | | After passion | 3.25 | 1.15 | medium |

According to the data in Table 5, the arithmetic averages of the domain paragraphs were at an average level, where paragraph (4) stated, "I feel sad for myself when thinking about using electronic cigarettes." came in first place with an arithmetic average (3.59), paragraph (3), which expressed concerns about using e-cigarettes, had the lowest ranking with an arithmetic average of 3.12, compared to the overall average of 3.25.

### *5.4 Third: Dimension of knowledge*

**Table 6**: Arithmetic Averages and Standard Deviations of Estimates of Study Sample Subjects based on the Dimension of Knowledge.

| M | Rank | Paragraph | Arithmetic mean | Deviation Normative | Level |
|---|---|---|---|---|---|
| 6 | 1 | I believe that the use of e-cigarettes may strain the individual financially. | 3.94 | 1.40 | big |
| 5 | 2 | I think the risks from using e-cigarettes are unpredictable. | 3.63 | 1.45 | big |
| 4 | 3 | The damage caused using e-cigarettes is difficult to control. | 3.57 | 1.38 | big |
| 7 | 7 | I do not think scientists and intellectuals really understand the dangers of e-cigarettes. | 3.42 | 1.42 | big |
| 2 | 4 | I do not have enough experience with e-cigarettes. | 3.19 | 1.56 | medium |
| 3 | 5 | The dangers of e-cigarettes are difficult to understand. | 3.19 | 1.50 | medium |
| 1 | 6 | I do not have much knowledge about e-cigarettes. | 3.04 | 1.60 | medium |
| | | After knowledge | 3.43 | .84 | big |

Table 6 shows that the domain paragraphs had high arithmetic averages. The paragraph that stated, "I think that the use of e-cigarettes may exhaust the individual financially." had the highest average (3.94), while the paragraph that stated, "I do not have much knowledge of e-cigarettes." had the lowest average (3.04). The overall average was 3.43.

### *5.5 Differences in Awareness of E-Cigarette Use Among Adolescents According to Demographic Variables.*

**Table 7**: Analysis of Quadruple Variance Without Interaction of Arithmetic Averages of The Estimates of The Study Sample Members on the Scale of Awareness of the Use of All Cigarettes Among Adolescents According to Demographic Variables.

| Variable | Sum squares | Degrees of freedom | Average squares | P value | Statistical significance |
|---|---|---|---|---|---|
| lifetime | .742 | 2 | .371 | .618 | .540 |
| Education level | 11.307 | 2 | 5.653 | 9.410 | .000 |
| Place of residence | 1.423 | 3 | .474 | .789 | .501 |
| Economic situation | 1.191 | 2 | .596 | .991 | .372 |
| Error | 154.999 | 258 | .601 | | |
| Total | 3580.838 | 268 | | | |
| Adjusted total | 172.124 | 267 | | | |

According to **Table** 7, there were no significant differences observed based on age, place of residence, or economic status. However, there were notable differences based on the variable of educational level. To assess the significance of the differences, dimensional comparisons were conducted using the LSD method in the following manner:

**Table 8**: Shows the Dimensional Comparisons Obtained Using the LSD Method for the E-Cigarette Use Scale by Educational Level.

| (I) Educational level | (J) Educational level | Difference between the two averages | Significance |
|---|---|---|---|
| Secondary | University | .2968(*) | .046 |
| | Graduate | .6871(*) | .000 |
| University | Secondary | -.2968(*) | .046 |
| | Graduate | .3902(*) | .006 |
| Graduate | Secondary | -.6871(*) | .000 |
| | University | -.3902(*) | .006 |

According to **Table** 8, there are variations in e-cigarette use across different educational levels, specifically secondary, university, and postgraduate studies. The findings indicate that the scale of e-cigarette use is higher among individuals in the secondary category.

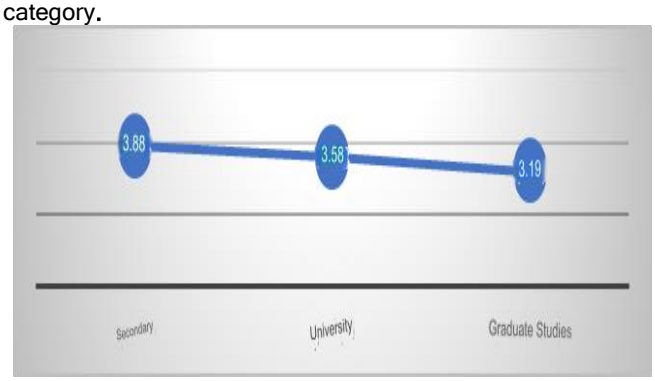


**Figure 3**: Shows from the Dimensional Comparisons That There Are Differences Between Secondary, University, and Postgraduate Studies, and The Differences Were in Favor of The Secondary Category of The E-Cigarette Use Scale by Educational Level.

## 6. Discussion

The highest average score of 4.02 in the study's findings suggested that students' thought processes were primarily responsible for their awareness of using electronic cigarettes. Knowledge also played a significant role, with an average score of 3.43, while emotions had the lowest average score of 3.25. This result can be attributed to the significance of thinking in the lives of adolescents and its role in cognitive and emotional development. It involves various thinking skills and methods, such as superficial and holistic thinking, critical thinking, and the ability to make informed choices. Additionally, it encompasses knowledge about the positive and negative aspects of electronic cigarettes. However, given its increasing appeal among both young individuals overall and the study group, it indicates that the participants displayed unfavourable thinking patterns and held negative beliefs about the use of electronic cigarettes.

These factors encompassed a proclivity for mimicry, a pronounced craving for smoking, and detrimental cognitive frameworks like exhibitionism. The findings of this study are consistent with those of prior research, suggesting a potential adverse effect on the mindset of the participants [6, 8, 9, 16, 18, 19], whose findings revealed the levels, patterns of awareness, and cognitive beliefs that influence the incidence and usage of electronic smoking among students and the specific target population of this study.

In terms of the cognitive aspect, it ranked second, as adolescents at this stage lack knowledge about the various components of the juice used in these cigarettes, as well as the different types of electronic smoking and their related components. This includes addictive substances that may contribute to the development of addictive behaviour and make it difficult for them to quit in the future, such as nicotine in high concentrations. The latest patterns of awareness suggest that cognitive awareness in adolescents is linked to their ability to self-control and achieve emotional balance. It is important for them to be able to regulate their emotions and control negative thoughts to maintain emotional well-being. These findings align with previous studies on the topic [7, 14, 20]. It was discovered that there were no significant variations based on age, place of residence, or economic status. This finding can be attributed to the similarity among adolescents in terms of these factors.

Additionally, adolescents of this age share similar psychological and social characteristics, as well as comparable developmental needs such as behavioural patterns and motivations for smoking, including electronic smoking, appearance preferences, and imitation of others. Specifically, and certain other attributes like the collective of peers and exaggerated emulation Within this context, individuals tend to amplify certain aspects, conform to societal trends, strive for personal growth, emulate influential figures, and seek connections with others, particularly those of the opposite gender. These traits and desires collectively suggest that there are no substantial variations based on these factors [11-13, 21]. One factor that contributes to smoking in adolescents is the desire to imitate adults, as they perceive smoking to assert their maturity. Moreover, peer influence plays a significant role, as friends who smoke can influence others to start smoking. Smoking may also be seen to fill leisure time and alleviate boredom. Lastly, family dynamics and the absence of a strong guiding influence can contribute to adolescent smoking.

During adolescence, individuals often experience a sense of confusion as they navigate their emotions, desires, needs, and aspirations. It is crucial for them to have guidance during this stage. In the absence of parental figures, some adolescents may turn to smoking as a coping mechanism. Furthermore, the presence of a family member who smokes can further increase their inclination towards smoking, as they perceive it to be less dangerous. Advertising also plays a role in attracting adolescents to smoking by presenting it as an exciting and novel experience, despite the obvious risks involved [22, 23]. Differences were observed based on educational level, particularly among students in the early stages of secondary and university. This could be attributed to various factors, such as family upbringing, parental involvement, and peer influence.

These findings suggest that educational level plays a role in the prevalence of electronic cigarette use. It is possible that a higher level of education is associated with the acquisition of new skills, forming new social connections, and experiencing various psychological and familial factors. These internal motivations may contribute to addictive behaviours or certain practices exhibited by individuals. The data suggests that individuals with a secondary level of education have a higher tendency to use electronic cigarettes compared to other educational levels. This finding indicates that adolescents may have lower self-regulation abilities and less awareness. From a cognitive standpoint, individuals may have limited factual knowledge and hold negative beliefs regarding smoking and vaping [11, 22, 23].

## 7. Conclusion of the Research

The researcher noticed a significant shift in the interests of young people towards negative behaviours such as substance abuse and e-cigarette usage. Based on this observation, the researcher set out to investigate how various demographic factors influence adolescents' awareness and use of e-cigarettes. This study was conducted using a quantitative research approach, and data was collected through a survey instrument. The researcher focused on studying adolescents from various educational institutions as the target population for the study. The data analysis showed that the concepts of age, economic value, and place of residence have no significant impact on adolescents' awareness of using e-cigarettes. Educational level was the only factor that showed a positive association with awareness of e-cigarettes. The researcher emphasised that the education level of adolescents

is the sole factor that can improve their cognitive and reasoning abilities, promote a healthy lifestyle and health consciousness, and protect them from the negative effects of e-cigarettes and other addictive substances.

## Significance of this Research

This study has yielded numerous important theoretical and practical implications. The studies aim to provide valuable insights into empirically evaluated factors and their strategic implications for researchers and practitioners. These findings can be utilised for various purposes.

## Theoretical Contributions

This study has provided new insights and added to the existing literature by highlighting the significance of education and awareness in preventing adolescents from engaging in harmful behaviours such as using e-cigarettes. This study has emphasised the empirical understanding of the relationship between education level and e-cigarette usage among youth. It underscores the importance of prioritising education to address this issue. This study has also emphasised the lack of impact of other demographic factors such as age, economic level, and place of residence on awareness levels. It suggests that researchers should prioritise the education level when conducting further investigations. This study has examined the significance of e-cigarette usage among adolescents and the potential impact of education on reducing youth attraction to and diversion towards e-cigarettes.

## Practical Implications of the Research

This study has not only explored the theoretical implications but also provided practical suggestions and effective strategies for practitioners such as education institute management, government officials, and parents. This study has emphasised the positive impact of education on adolescents' awareness of e-cigarette use. Based on this significant finding, the researcher has outlined a roadmap for society to prevent the younger generation from engaging in substance abuse. The findings of this study provide valuable insights and recommendations for universities, high schools, and other educational institutions. These institutions can use the information to develop effective strategies for promoting awareness and educational content that will help young people develop strong knowledge and critical thinking skills. By addressing the issue of addictive substances and their consequences, we can better equip youth with the necessary tools to make informed decisions. The government can utilise the study's contributions and findings to gain insights into the educational benefits of addressing negative perceptions of e-cigarettes among adolescents. This will help ensure the safety and well-being of the younger generation. The study has revealed a concerning factor regarding e-cigarette usage among adolescents. It emphasises the importance of parents and guardians monitoring their activities to protect them from harmful habits.

## Limitations Observed.

In addition to the significant implications mentioned above, this study acknowledges a few limitations that the researcher noticed during the research process. Despite the limitations, the study remains valuable and important. Furthermore, these limitations serve as important starting points for future researchers to address and overcome. One limitation of this study is its focus on a specific target population. This study focuses on adolescents in the educational sector and does not specify any level of educational institutions. Data was collected from students at various education levels. Furthermore, this study lacks visual aids to clarify the impact of gender on the prevalence of e-cigarette use within different demographic groups. The researcher focused solely on demographical factors to assess their impact on the awareness level of student adolescents who use e-cigarettes. However, no additional variables were provided to aid in the construction and determination of awareness levels regarding the consequences of e-cigarette usage.

## Recommendations

The researcher has used the limitations of this study to make suggestions and future recommendations that can be adopted by future scholars to expand the literature and further develop the concept of this study. In future studies, it is recommended to consider alternative sampling techniques and clearly define a specific group within the targeted sector. This will help to produce more reliable and significant findings and implications. Furthermore, it is important for studies to utilise a comprehensive empirical model that includes all relevant variables that significantly influence the level of awareness among adolescents. In this field, researchers can utilise gender as an explanatory variable along with other factors such as knowledge of the consequences of e-cigarettes, prelude awareness, subjective norms, and other variables found in the existing literature. Future studies may consider examining the level of awareness and voluntary cessation of e-cigarette use following the acquisition of knowledge about its consequences. This can be achieved through a longitudinal study that collects data at intervals, both before and after individuals become aware of the potential harms. Furthermore, it is worth noting that the e-cigarette is not limited to the student or adolescent demographic. Its presence extends to other sectors that warrant further investigation.


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## Conflict of Interest

The authors state that the research was conducted without any commercial or financial relationships that could be perceived as a potential conflict of interest.

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