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Electronic Cigarettes Behavior Pattern and Health Locus of Control Among Young Adults

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Abstract:

Adolescent and young adult consumption of e- cigarettes has rapidly increased in the last five years. This study of 51 respondents (18 - 28 years) is aimed at investigating the knowledge, attitudes, use as well as the health locus of control of the respondents towards e-cigarettes. The data for this study was collected online through Google forms. A self-designed questionnaire was used to assess the knowledge, attitudes, and use of e-cigarettes and, the Multidimensional Health Locus of Control Scale was used to assess the Health Locus of Control (HLoC) of the participants. Results were analyzed using percentage and correlational analysis. The results showed that there was a heavy peer influence in initial exposure to e-cigarettes and a family history of smoking was also a contributing factor. Additionally, many respondents did not indulge in daily use and demonstrated awareness of the various health risks associated with it. There is a significant association between the attitudes of the respondents towards e-cigarette smoking and the dimension of external locus of control. Furthermore, a thematic analysis was conducted based on semi structured interviews of 12 participants to identify underlying themes of the study. Common themes like influence of peers and appeal on e-cigarette use, stressful situations and difficult emotions and accessibility as contributing factors of e-cigarette use were identified.

Keywords: E-Cigarettes, Vaping, Smoking, Health Locus of Control

Introduction:

In recent years, e-cigarettes have gained popularity as a potentially less harmful alternative to traditional cigarettes. E-cigarettes, also known as electronic cigarettes, are battery-powered devices that heat a liquid (often containing

nicotine) to create an aerosol, which is then inhaled into the lungs. They are also called e-cigs, vapes, vape pens, e-hookahs, and electronic nicotine delivery systems (ENDS) **(Marques et al., 2021).** Concerns have been raised about the rising popularity and availability of e-cigarettes together with its unique nature and flavorings that may attract youth to try it. A controversy was generated around e-cigarettes within the tobacco control field; some recommend using e-cigarettes as a smoking cessation aid while others debate that e-cigarettes should be banned due to lack of safety and efficacy data.

E-cigarette use in India is a significant health risk for young adults, increasing addiction, long-term harm to brain development and respiratory health, and being linked to other tobacco products like regular cigarettes, cigars, hookah, and smokeless tobacco **(Timesofindia.com, 2023).**

Peer pressure and other social influences contribute to the use of e-cigarettes in India. People feel pressured to try e-cigarettes because their friends or family members are using them. This pressure can be especially strong among young people, who may be more influenced by the behavior of their peers.

The consumption of e-cigarettes is influenced by Knowledge, awareness, and misconceptions surrounding e-cigarettes largely influence its consumption. Despite the Indian government's ban on sale of e-cigarettes in 2019, misconceptions continue. These misconceptions include beliefs that they contain less harmful nicotine or that the water vapor they produce neutralizes dangerous chemicals or that e-cigarettes are less addictive than traditional cigarettes. A perception of sorts is formed around E – cigarettes as them being cleaner and a means of smoking cessation and claim to believe that E – cigarettes are not an addictive substance. E-cigarettes are serving as a gateway to smoking for young adults (Vaping myths, n.d.). Additionally, using e-cigarettes increases the risk of developing asthma and chronic obstructive pulmonary diseases. Furthermore, the versatility of vaping systems allows for the consumption of various substances beyond nicotine, including illicit drugs like marijuana and opioids. Safety concerns also arise from defective e-cigarette batteries, which have been known to cause fires and explosions, posing serious risks to **users (Vaping devices (electronic cigarettes) DrugFacts, 2023)**.

There are various cases being raised regarding the product appeal of E – cigarettes to adolescents or the youth and the young adult population. Production companies glamourize their products to appear more interesting and trendier. These products come in various shapes and sizes and are designed in a manner that are user friendly and

easy to carry and use. Production companies glamourize their products, offering various shapes, sizes, and user-friendly designs. The flavors of e-liquids, such as menthol, candy, sweets, fruit, chocolate, and alcohol, give the impression of sweetness **(Goldenson, 2019).** Despite India's complete ban in 2019, e-cigarettes remain accessible to youngsters, and their use in public places is increasing. The lack of regulation in India allows e-cigarettes to be sold and marketed without restrictions, allowing companies to promote their products and increase their **use (Despite ban, e-cigarettes remain a major health challenge in India: Study, 2023).**

APA defines locus of control as "a construct that is used to categorize people's basic motivational orientations and perceptions of how much control they have over the conditions of their lives''. Health locus of control is a psychological construct that refers to an individual's beliefs about the extent to which they have control over their health and the health-related outcomes they experience **(Lefcourt, 1984)**. Those who have an internal locus of control believe that a person can control his or her health condition and that health-related outcomes are contingent on a person's behaviors and actions, whereas those who have an external health locus of control believe that a person believes that outside factors such as doctors, other people, or chance determine health outcomes **(O'Bryan, 2021)**. Research has shown that an individual's locus of control can affect their health and well-being. Individuals with an internal locus of control tend to engage in healthier behaviors, such as exercising regularly, eating a healthy diet, and seeking medical care, when necessary, adherence to treatment and experience lower stress levels **(Cherry, 2022)**. Conversely, individuals with an external locus of control may be more likely to engage in unhealthy behaviors, such as smoking, drinking alcohol excessively, and not getting enough exercise, and are less likely to seek medical care when they need it **(Garrido, 2023)**.

Literature Review:

In research by **Natto's (2020)**, it shows that dental students in Saudi Arabia have limited knowledge about the harmful effects of e-cigarette use. The questionnaire assessed their knowledge about e-cigarettes, attitudes towards e-cigarette use, and their intention to use e-cigarettes in the future. The results of the study showed that 43.7% of the participants had tried e-cigarettes, and 71.7% believed that e-cigarettes were less harmful than traditional cigarettes. The findings of this study suggest that there is a need for increased awareness and education about the potential health risks associated with e-cigarette use among college students.

Phua's 2019 study examined the impact of e-cigarette-related social media communities on quitting attitudes, self-efficacy, and intention to quit. The survey revealed that participation in these communities positively influenced quitting attitudes, self-efficacy, and intention to quit. However, users who believed their close friends and family were against e-cigarette use had more negative views, worse self-efficacy, and lower intention to quit. The study highlights the importance of understanding and addressing these factors in promoting quitting behavior.

A study by **Abu-Baker and his associates (2022)** assessed the knowledge and attitudes of Jordanian adolescent males towards e-cigarettes. The results showed that 35% had tried e-cigarettes, while 43% had tried tobacco cigarettes. Most participants, 97.2%, had heard of e-cigarettes, but 63% were unaware of their components. 89.2% agreed that e-cigarettes are dangerous, while 55.6%) believed they are cleaner than tobacco smoking. 61.4% believed e-cigarettes can help quit smoking. Adolescents who used tobacco and e-cigarettes had higher knowledge scores and lower attitudes.

The study by **García-Ferrer et.al.** aimed to understand the knowledge, attitudes, and behaviors of adolescents and young adults on e-cigarettes. Results showed that consumption is most prevalent for pleasure, fun, or relaxation, especially among those under 26 years old. The percentage of e-cigarette use is higher when meeting friends, particularly among those aged 19-22. Despite the perceived health risks, e-cigarette use is generally healthier than traditional cigarettes, with a 52.80% rate.

The study by **Duplaga and Grysztar in 2022** examined the factors influencing the use of electronic cigarettes among high school students in Poland. The research found that 47.5% of respondents had used e-cigarettes in the past and 18.6% in the last month. However, health literacy (HL) was not significantly associated with e-cigarette use. Two types of external HLC were associated with past e-cigarette use, and 'Chance' HLC was associated with last-month use. Students who smoked traditional cigarettes were more likely to use e-cigarettes.

A Jordanian study by **Muna Barakat et.al** found that 56.4% of Jordanian adults had replaced tobacco entirely with electronic cigarettes, with most (99.2%) having heard about them from personal contacts, friends, family, social media, and media advertisements. Only 4% were unaware of E-cigs, and half reported moderate

knowledge. The majority agreed that E-cig usage is a public health concern and should be regulated at work and in public places, similar to tobacco smoking.

The study by **Srivastava, Saha, Giri, Priyadarshini, Ahuja (2018)** examined the knowledge and practice patterns of electronic cigarettes in India. It found that 57.77% of people had regular nicotine intake, but only 60.95% were aware of e-cigarettes. Information was gathered through peers, internet, newspapers, and family members. 31.74% believed e-cigarettes were less harmful than other tobacco products, while only 10.16% believed they had side effects. Short-term adverse effects included discomfort, headache, and skin burns. Availability and high cost were deterrents, while glamour and feeling good were associated with craving for e-cigarettes.

A study by **H.A. Gupta et al. (2022)** revealed that 24 adolescents referred to E-cigarettes as "pen-hookahs" and perceived them as less dangerous than traditional hookahs and cigarettes. The initiation of E-cigarette use was influenced by friends, peers, and playful tricks, while social media and peers also influenced its continuation. The study suggests urgent awareness of E-cigarette dangers through comprehensive tobacco-prevention programs.

In a qualitative study by **B.N. Coleman et al. (2015),** aimed at exploring consumer preferences about E-cigarettes including knowledge, attitudes, and perceived social norms among the adult population. The results obtained stated that participants reported a lack of information and knowledge about E-cigarettes while also expressing many positive attitudes towards them. Participants in focus groups unanimously agreed that the ingredients in E-cigarettes were likely less harmful than those in traditional cigarettes. Furthermore, many reported positive reactions from family and friends, particularly when E-cigarettes were used instead of traditional cigarettes.

In a study by **Sapru, S., Vardhan, M., Li, Q. *et al.* (2020)** substantial evidence was found pertaining to the impact that multiple flavors have in the increased consumption of e-cig. They also found that the ease of buying, and use of e-cigarettes has made them readily available to young students. However, e-cigarettes can be used anywhere because they don’t smell like tobacco and they’re easy to conceal from adults. According to Kralikova et al., some users use e-cigarettes in places where c-cigarettes are banned.

A study examining the impact of flavor on cigarette smokers' smoking and vaping habits found that e-cigarette flavours significantly influence their consumption patterns. Participants successfully replaced their

cigarettes with e-cigarettes for six weeks, with menthol-flavored e-cigarettes being the most popular. However, those given chocolate-flavored e-cigarettes were more likely to continue with their cigarettes, indicating that e-cigarette flavours significantly influence cigarette smoking habits. **(Litt et al., 2016)**.

Methodology:

Hypothesis

There is a relationship between positive or negative attitudes towards E-cigarettes and Health Locus of Control.

Objectives

To study the relationship between attitudes towards E-cigarettes and Health Locus of Control.

Research Design

A Mixed Research design was used to study the relationship between Health Locus of Control of participants and their Attitude towards E-Cigarettes. It was selected to measure the strength and direction of the relationship between the two variables. Percentage analysis was used to study the influence of other variables like use, knowledge of e-cigarettes. Furthermore, semi structured interviews were conducted for a total of 12 consenting participants to gather better insights.

Sample

The sample included young adults aged between 18-28 years who indulge in the use of any forms of E-Cigarettes including Vape Pens, Juul, E-Cigars and E-Hookahs. The study utilized an online self-report measure to collect data from 51 participants, consisting of 28 males (55%) and 23 females (45%). A convenience sampling method was used to select the study participants and they were also invited through social media platforms and online forums.

Method of Data Collection

The questionnaire administered for this study was developed by the researchers based on relevant literature reviews. These questionnaires were circulated online through google forms. Convenience sampling was used for

the process data collection. The participants were assured of their confidentiality and that the data will not be misused in any way or form. A set of semis structured in person or face to face interviews were conducted to collect data from 12 consenting participants to better understand the themes surrounding the topic. The interview questions for the same were developed based on thorough literature reviews.

Tools Used for Data Collection:

Multi-Dimensional Health Locus of Control Scale (MHLCS)

The Health Locus of Control was measured by using the Multidimensional Health Locus of Control Scale (MHLC). This scale was developed by Dr. Kenneth A. Wallston. The scale consists of three forms. Form A, form B, and form C. Forms A and B are used to measure general health locus of control whereas form C is used to assess the health locus of control of individuals who already have a medical condition. For the purpose of this study, only form A is used.

Knowledge, Attitudes and Use of e-cigarettes Questionnaire

After thorough literature reviews, a questionnaire was prepared to measure the knowledge and attitudes of young adults towards e-cigarettes. The questionnaire measures the attitudes, knowledge about e-cigarettes as well as their e-cigarette smoking habits. The knowledge dimension of the questionnaire measures how aware an individual is about the various laws pertaining to e-cigarettes, its safety, how safe e-cigarettes are to use, dangers they pose to one's physical health, restrictions levied on e-cigarettes, in terms of their sale, distribution and usage. It also includes items pertaining to advertisements of e-cigarettes. Attitudes towards e-cigarettes include beliefs about e-cigarettes in terms of its acceptability and appeal. It consists of items that measure the extent to which young adults think e-cigarette usage is socially accepted, attractive. The questionnaire also consists of a few items that measure the influence of peers on e-cigarette usage.

Statistical Analysis and Interpretations:

Results:

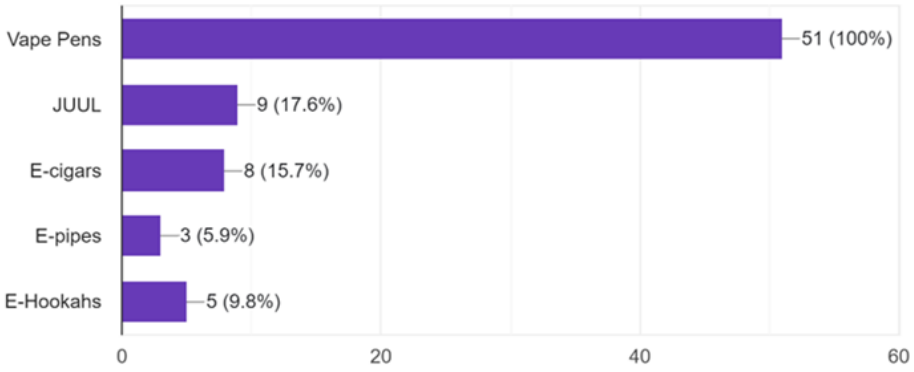
Table 1

Demographic details

Age	Percentage	Number
17-20	37.3%	19
21-25	58.8%	30
26-28	3.9%	2
Gender		
Male	54.9%	28
Female	45.1%	23
Socio-economic Status		
Upper class	18.8%	9
Lower class	0	0
Middle class	81.3%	39

The above table shows the demographic details of the participants.

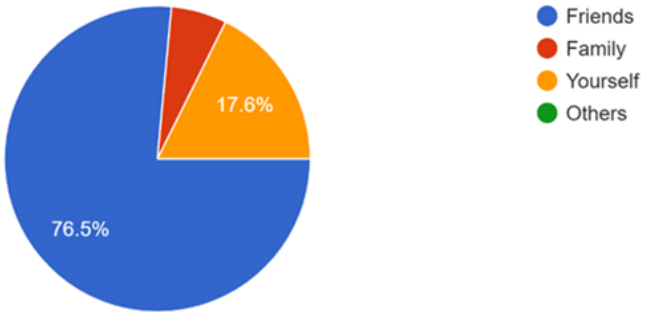
Figure no. 1



The aforementioned chart depicts the type of e-cigarette used in major proportions.

100% people use vape pens. 17.6% of the people use JUUL pens. 15.7% of the people use e-cigars, 5.9% of the people use e-pipes and 9.8% of the people use e-hookahs. From the chart we can infer that vape pens are the most popular type of e-cigarettes among the youth.

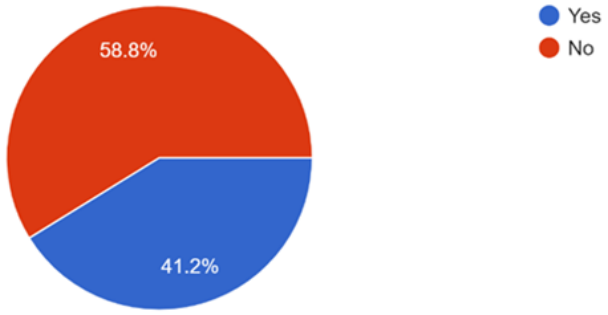
Figure no. 2



The aforementioned chart depicts the people that introduced participants to smoking e - cigarettes.

76.5% of the participants were introduced to e-cigarettes through their friends. 17.6% were introduced to e-cigarettes by trying it themselves and 5.9% of them were introduced to e-cigarettes by their family.

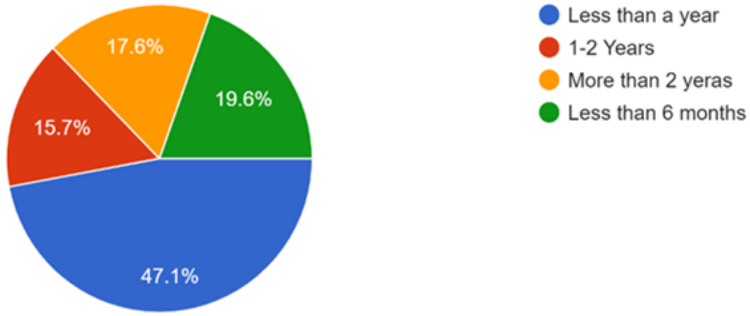
Figure No. 3



The aforementioned chart depicts if anyone in the participant's family has a smoking habit.

58.8% of the participants revealed that at least someone in their families has a smoking habit. 41.2% of the participants revealed that no one in their family smokes. 39.2% of the participants stated that they have at least 3 to 5 friends who smoke e-cigarettes. While a minority of 13.7% of the participants revealed that they have about 5 to 8 friends who smoke e-cigarettes.

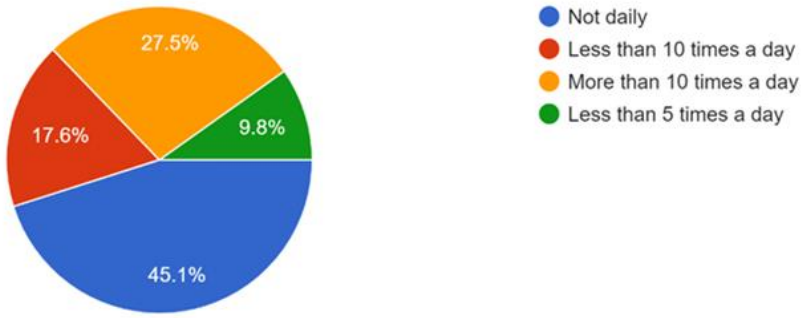
Figure no. 4



The aforementioned chart depicts how long participants have been smoking e-cigarettes.

A majority of 47.1% of the participants revealed that they have been smoking e-cigarettes for less than a year. 19.6% of the participants have been smoking e-cigarettes for less than 6 months. 17.6% of the participants revealed that they have been smoking e-cigarettes for more than 2 years. A minority of 15.7% of the participants have been smoking e-cigarettes for one to two years.

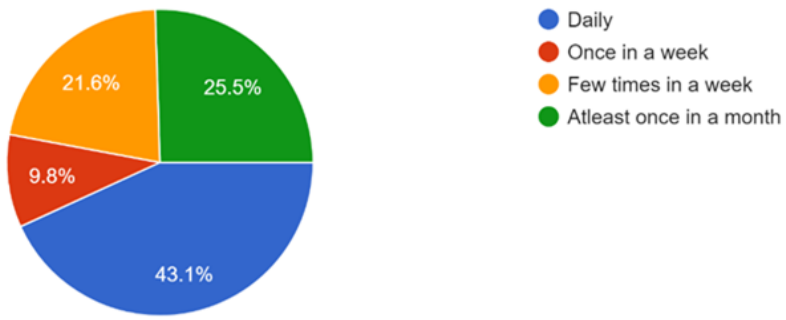
Figure no. 5



The aforementioned chart depicts how many times participants smoke an e-cigarette per day.

45.1% of the participants revealed that they do not smoke e-cigarettes daily. 27.5% of the participants admitted to smoking e-cigarettes more than 10 times a day, only a minority of 9.8% of the participants admitted to smoking e-cigarettes less than 5 times a day. 60.8% of the respondents reported using e-cigarettes for less than an hour. 25.5% reported that they use it for about one hour. Only a minority of 2% use it for two to three hours a day. 76.5% of the respondents reported that on a daily basis, their smoking pattern varies from time to time. 11.8% of people reported that they use e-cigarettes within a few hours, and 11.8% of the respondents reported that they use e-cigarettes immediately after they wake up. The majority of the respondents did not start their day by using vapes whereas a few proportions started their day with the use of vapes immediately after waking up.

Figure no. 6



The aforementioned chart depicts how often participants vape with their friends.

43.1% of the respondents use vapes daily with their friends since the majority of the individuals learned about e-cigarettes through friends. 25.5% of the respondents reported that they use vape at least once a month. 21.6% of respondents reported that they use vapes a few times a week.

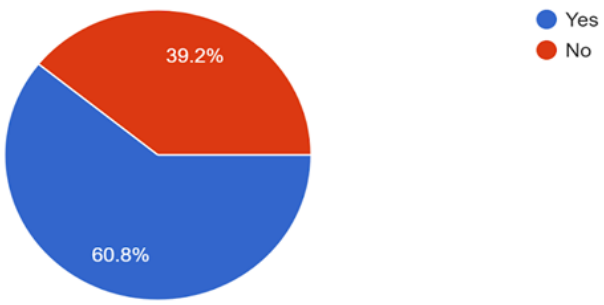
It was found that 84.3% of the respondents used their friends vape before buying their own, and 15.7% of respondents bought their own vapes directly without any reference. Results also revealed that 68.6% of the respondents already used vapes and that they were the source for their friends for buying vapes and 31.4% of the respondent's friends did not use their vapes before buying their own.

Knowledge regarding E-cigarettes

Results showed that while a majority of participants i.e 88.2% are aware that e-cigarettes aren't approved by the health ministry of India, about 17% aren't aware of this fact. A majority of about 72% are aware that e-cigarettes can explode.

A wide majority of 88.2% participants agree that e-cigarettes are harmful for their health. While a wide majority of about 90% are aware that e-cigarettes contain nicotine, the remaining 10% aren't aware of this fact. A wide majority of 96% participants are aware of the fact that e-cigarettes are addictive in nature.

Figure 7

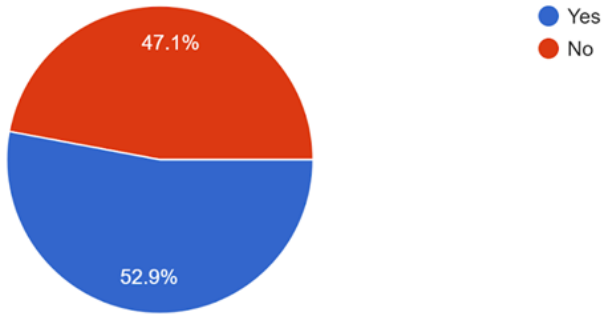


The aforementioned chart depicts the proportion of participants who feel that e-cigarettes are less harmful than traditional cigarettes.

60.8% participants believe that e-cigarettes are less harmful than traditional tobacco cigarettes while the remaining 39.2% believe otherwise.

About 66% are aware that e-cigarettes don't pose a lower risk of cancer than traditional cigarettes. A wide majority of 82% participants are aware that e-cigarettes reduce lung capacity. Around 67% participants are aware that e-cigarettes can cause spikes in blood pressure, the remaining 33% aren't. Roughly 56% are aware that e-cigarettes affect brain development.

Figure 8



The aforementioned chart depicts the proportion of people who believe that E-cigarettes help reduce passive smoking.

About half the participants feel that e-cigarettes help in reducing passive smoking while about 47% believe otherwise.

A Pearson correlation was run using SPSS to study the relationship between attitudes towards smoking and health locus of control and the following results were found.

Table 2

Correlations

		Chance	Attitude
Chance	Pearson Correlation	1	.258*
	Sig. (1-tailed)		.034
	N	51	51
Attitude	Pearson Correlation	.258*	1
	Sig. (1-tailed)	.034	
	N	51	51

*. Correlation is significant at the 0.05 level (1-tailed).

A low yet significant positive correlation of .258 was found between chance health locus of control and positive attitude towards E-cigarettes.

Table 3
Correlations

		PO	Attitude
PO	Pearson Correlation	1	.240*
	Sig. (1-tailed)		.045
	N	51	51

Attitude	Pearson Correlation	.240*	1
	Sig. (1-tailed)	.045	
	N	51	51

*. Correlation is significant at the 0.05 level (1-tailed).

Similarly, a low yet significant positive correlation of .240 was found between powerful other i.e. external health locus of control and positive attitude towards e-cigarettes.

Table 4

Correlations

		Internal	Attitude
Internal	Pearson Correlation	1	-.180
	Sig. (1-tailed)		.103
	N	51	51
Attitude	Pearson Correlation	-.180	1
	Sig. (1-tailed)	.103	
	N	51	51

A low negative correlation of -.180 was found between internal health locus of control and positive attitude towards e-cigarettes.

Thematic Analysis:

This paper also employs a thematic analysis approach to better understand and explore the knowledge, usage, attitudes, and health locus of control in depth. The data for the thematic analysis was collected through semi – structured interviews from 12 consenting participants. The verbatim material collected from these interviews was transcribed and analyzed to uncover the underlying themes and variances in the experiences, and perceptions of the respondents.

Influence of Peers on E-cigarette Smoking:

The influence of peers on e-cigarette smoking was very evident and involved many social dynamics. Close friend groups, social circles, and even flat mates had led individuals to experiment with vaping in-order to fit in and avoid feeling left out. Curiosity played a significant role.

Excitement to try new things and also because many of my friends were doing it would be the primary reasons, I started smoking e-cigarettes. (S1)

Honestly it was pure curiosity at first as a couple of my friends were into it and I thought that I could give it a try. (S3)

So initially, I got into the habit of smoking e-cigarettes because of the people around me. Mostly because of the social relationships I had as well as my friends. I had first tried an e-cigarette when I was with my friends, and I had enjoyed using it. (S5)

So, initially when I saw people around me doing it made me very curious to know more about it and try it. (S8)

To be honest the reason why I started vaping was because one of my flat mates introduced me to it. (S9)

One major influence is the people around you, so around me, there are a lot of people frequently using e-cigarettes. Also, there was this whole period where everybody was smoking e-cigarettes and had vapes in their hand and I think somewhere that too had an impact on me. (S12)

1. Appeal as an Influencing Factor for E-Cigarette Smoking

The respondents reported that the variety of flavours available played a major role in their decision to consume e-cigarettes. Many of them reported that trying new flavours is an exciting process for them which allows them to experiment. Once they finish using a flavour, they try new ones so that they do not get bored of them. The flavours often have very creative names which increases its appeal. The aesthetic packaging of the e-cigarettes also makes it appealing to the users.

To be honest choosing a flavour is very exciting, there are varied options. One cannot stick to only one flavor, it keeps on changing. (S4)

E-cigarettes come in very attractive packaging, usually in very bright colours which makes them seem very aesthetic and attractive, especially to young people. (S5)

As I mentioned, I like trying new flavour when one flavour is empty. I see which flavour I like. (S6)

The fact that the flavours are branded in a manner that makes it sound more like a fragrance also helps. A majority of the vapes have flavours such as passion fruit bliss, strawberry bubble-gum, and watermelon musk (S9)

The flavours have a massive range, ranging from regular mint and lemon to desert-like flavours such as vanilla, chocolate, custard and even coffee tiramisu (S10).

Eventually when you keep using one you get bored of that flavour too so variety plays a big role as I can switch to new flavours (S11).

3. Accessibility as a Factor of Use

Majority of the respondents reported that constant and easy accessibility of E-cigarettes acts as a major factor of maintaining its use. Most of them felt that one major drawback of smoking nicotine cigarettes is the need to look for an appropriate place to smoke and later using other means to mask the smell. However, in the case of e-cigarettes, out of pocket availability makes it easier to use whenever one wishes to and it even leaves a pleasant smell behind.

I do try to factor in my vaping habits into my daily routine- so it's like when I wake up, I can like just to take a puff because it's easily accessible and during my break or when I'm chilling with my friends. (S2)

Once I tried them, it was a nice experience using them, because of the smell, unlike cigarettes, it doesn't have a bad smell. (S3)

It's great. I vape the moment I wake up. it's accessible and easy to use anywhere. (S6)

Till now it's good using e-cigarette. It's very easy to carry everywhere. It's very handy. I vape normally with my friends and rarely at my home. No one knows if you are vaping because it leaves normal smell like of a mint or cola. (S7)

…So, this transformed into keeping the pen on my nightstand and taking a puff as soon as I woke up. (S10)

It's easily accessible and it fits into my daily routine because I don't have to go out for cigarettes, and I don't smell of smoke. So, the number of times I use it can be a lot. (S11)

So, basically e-cigarettes are way more convenient to you, you can do it anywhere you want. (S12)

4. Awareness of Health Risks and External Health Locus of Control (HLoC) of Respondents:

The respondents candidly expressed that despite being aware of the health risks and chances of developing life threatening ailments, they do not wish to partake in the process of cessation of e-cigarette smoking. Respondents have shown evident displacement towards peers and friends in e-cigarette indulgence hence confirming the quantitative analysis of the respondents having a high external health locus of control.

To be honest, I know the adverse impact that e-cigarettes have on our body, but I haven't really thought much in depth about it as the activity relaxes me and reduces stress. (S1)

I mean, I definitely knew that there were some risks when I started vaping …… I have thought about cutting back a few times but haven't been able to bring myself to do it. I do spend most of my time with my friends

and they constantly keep on vaping around me I can't stop myself from pulling out the vape pen and joining them. I feel like I have some more support from my friends maybe that could help me to quit. (S2)

I feel when it comes to quitting or starting, the kind of people you surround yourself with, the company around you matters a lot. (S5)

I think if I change my friend circle and meet new people who don't indulge in Vaping then I might quit. (S6)

I knew before I started smoking e-cigarettes that they are dangerous but still started it with my friends …. I just need motivation from my friends who don't smoke. If they encourage me more and more then I think I will be able to quit. (S7)

I know it's harmful for both our health and the environment as well and I have been reading about the defects that long term vaping can cause and I will definitely try to reduce my use but, there is really no motivation for me to quit it at the moment. (S9)

5. Stressful situations and difficult emotions: Factors for excessive use of e-cigarettes.

The majority of the respondents reported that they used to resort to the use of e-cigarettes when they faced any kind of stressful situation, particularly related to academics, family, and personal life stress. Before trying e-cigarettes, most respondents experienced discomfort and high levels of anxiety, prompting them to crave e-cigarettes excessively. Subsequently, the calming, relaxing, and energizing effects of e-cigarettes were noted post-usage, leading to a frequent habit of e-cigarette use.

It is mostly academics related and personal life stress. I am dealing with quite a few challenges in my relationship as well and e-cigarettes help me to calm down. (S1)

Social situations, when I'm with my friends, also trigger my need to use e-cigarettes. After I use it, I feel energized and I am able to loosen up, relax and have fun with my friends. … So before using it I'm stressed out, anxious about the future, but once I do use it, all my worries go away. (S3)

On days where I am very stressed out or when I am really tired or tense, I feel a strong urge to use e-cigarettes. It provides a sense of relief and relaxation that you cannot attain otherwise. (S5)

Earlier it was just study stress or academic stress. But gradually when there were problems at my home I started using vape more. So currently most of the time I use vape when there is any family stress… So, whenever I am in stressful situations, I immediately start vaping because it relaxes me. I feel calm immediately after smoking e-cigarettes. (S7)

I mean by now you've understood that this is a knee-jerk reaction for me. Need anything, take a puff, feel anything take a puff. So yeah, in that sense probably this is like a coping mechanism for me…. it's accessible to me and I feel good. (S9)

But there have been times when a difficult assignment was announced in class, and I would leave in between go to the washroom take a few puffs of the e-cig and come back; and the best part was that I would wave my hand 2/ 3 times around my face and steam would vanish and would leave a perfume like fragrance wasn't really harmful for me in that situation. (S10)

In the case of emotions, its mostly laziness, restlessness, and stress that triggers the use of e-cigarettes…. Sometimes what happens is, if you have not taken a puff in the day and you're feeling stressed, and you take that first puff it gives you that rush and helps you calm down. (S11)

Discussion:

The purpose of this study was to analyze and understand the knowledge, attitudes, use and health locus of control associated with Electronic Cigarettes amongst the young adult population. Through comprehensive analysis of the collected data, the findings of this study highlight the extent to which the young adult population is having

sufficient knowledge related to the health risks associated with e-cigarette consumption, the attitudes of the respondents towards e-cigarette smoking and their health locus of control.

It is evident from the findings that the respondents prefer using Vape pens and were introduced to e-cigarettes through their friends and peers. **(Daniluk A. et.al, 2017)** concluded that, respondents participating in the survey indicated that friends were their source of knowledge on e-cigarettes. Young adults who were exposed to e-cigarette advertisements were influenced by them and were curious to try them out. Social media platforms such as Instagram have been a leading promotional platform for the positive portrayal of e-cigarettes, by highlighting the trendy appeal, extensive choice of flavors, hedonic value, and features of smoking cessation **(Deepika Bahl et. al, 2023)**. Thereby supporting our findings i.e., Majority of the respondents switched to e-cigarettes based on the belief that it leads to smoking cessation, and that different flavors and the appeal of e-cigarettes make them interesting and attractive to use. Majority of the respondents reported that, they use e-cigarettes daily i.e., in intervals of a couple of hours. In a longitudinal study conducted by **(E. C. Hair et.al., 2023)**, it was observed that there was a significant switch in the proportions of daily cigarette smokers who switched to daily e-cigarette use.

A vast majority of the respondents also reported that at least someone smokes in their family. As stated by **(S.E. Gilman et. al, 2010)** in their study, parental smoking habits are associated with a higher risk of smoking initiation in their adolescent children.

The findings also suggested that the majority of the respondents, believed that e-cigarettes approved by the Ministry of Health in India, are harmful to one's health. The respondents were also aware of the tobacco and nicotine content in them. The vast majority of the participants were aware of the health-risks associated with e-cigarette, including explosions and effects on brain development. In a study by **(Daniluk A. et.al, 2017)** it was observed that, many of the respondent's despite of being regular e-cigarette smokers, had differed responses concerning the health risks associated with e-cigarette smoking as, many regular consumers were unaware of the exact chemical composition within the ENDS device.

The findings of the self-report measure concluded that positive attitudes of the respondents towards e-cigarette smoking indicated an external health locus of control. The correlation between the chance and the powerful other dimensions of the Multidimensional Health Locus of Control and attitudes toward e-cigarettes reveals a significant positive relationship. A correlation of 0.25 on the chance dimension and 0.24 on the powerful others scale indicates that individuals who attribute the health outcomes to factors such as fate, destiny, family, or peers exhibit positive attitudes towards e-cigarette smoking. A paralleling study conducted by, **(Helmer, Hramer, and Mikolajczyk ,2012)**, found that higher scores in the second external locus of control dimension (beliefs in luck or chance) were associated with a higher likelihood of current smoking, lower physical activity, and less attention to healthy nutrition. Another study found that external locus of control remained a significant predictor of smoking. A significant relationship between external locus of control and fun-seeking and smoking behavior was found **(Lee, Roberts, Kiong, Christopoulos, 2022).** The empirical results thus obtained suggest that there is no significant correlation between the attitudes of the respondents towards e-cigarette smoking and Internal Health Locus of Control.

To gain a better understanding of the perceptions and experiences surrounding the use and indulgence of e-cigarettes and the awareness of the youth regarding the health risks associated with it, a thematic analysis approach was employed. Through a series of semi structures in person interviews of 12 consenting participants, the study identifies certain leading themes encompassing the knowledge, attitudes, use and health locus of control related to e - cigarette smoking.

The thematic analysis elucidates that there is a significant amount of peer influence and curiosity among young adults that prompts the excessive indulgence in e-cigarette smoking. Majority of the youth of today also thrives on curiosity and thereby the behaviors are mostly encouraged by the will to try something new. The analysis also highlights certain recurring themes such as the appeal of the product i.e. The aesthetics, branding, and the variety of flavors as a prompting factor of use; accessibility of the product and the ease of use, lack of noticeable odors and the possibility of choice of smoking indoors acts as a reinforcing factor for continued use. Themes such as awareness of the health risks associated with e-cigarette consumption and the unwillingness to quit staunchly emphasized upon the association between the attitudes of the respondents and the dimension of external Health locus of Control. The

findings also showed that other factors such as stressful situations and overwhelming emotions, yielded the need to vape or smoke to elicit a calming and relaxing feeling for the respondents. This was supported by another study conducted by **Erahabor et.al (2019),** where the results showed that 32.7% participants reported current e-cigarette use and among those there was major prevalence of individuals who experienced psychosocial stressors.

Limitations and Suggestions of the Study:

1. The sample was limited in geographical aspects, i.e. most of the individuals filling the form were from Pune or generally from Maharashtra.
2. The use of self-reports as a data collection method may limit the veracity of the results, since participants may have response biases, ranging from a misunderstanding of the items to social desirability bias.
3. Due to the large number of items, a sense of fatigue might set in and influence the responses.
4. The sample size was fairly small. This might account for the low statistical significance of the study.

Implications of the Study:

1. The findings of the research may provide insight into potential interventions that can be used to reduce e-cigarette smoking. Health communication messages can be tailored based on the health locus of control of the target audience.
2. This information can be used to inform public health campaigns aimed at reducing e-cigarette use and preventing negative health outcomes.
3. This study can help with understanding the social norms surrounding e-cigarette use among young adults. This can inform interventions aimed at changing social norms and reducing the prevalence of e-cigarette use among young adults.
4. The findings of our research can be extended to future studies pertaining to general smoking behavior in the area of Health Psychology.

5. The relationship found between Health Locus of Control and Attitude towards use of E-Cigarettes can be applied in the de-addiction and rehabilitation to restructure patient's beliefs about the control they hold over their health and health promoting behavior.

Conclusion:

This study concludes that a vast majority of the respondents were introduced to e-cigarettes through friends and prefer using vape pens. Where a few respondents are aware of the nicotine content and the adverse health effects associated with e-cigarette smoking, the remaining half believe that it aids in smoking cessation of traditional cigarettes. A significant correlation was found between the positive attitudes of respondents towards e-cigarette smoking and external health locus of control. Furthermore, a thematic analysis was further conducted to identify common themes surrounding e-cigarettes amongst the respondents.

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