RESEARCH ARTICLE

Adolescents and E-cigarettes in India: A Qualitative Study of Perceptions and Practices

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Abstract

   Purpose: Global Youth Tobacco Survey-4, India conducted in 2019 showed 'ever use' of e-cigarettes among adolescents to be 2.8%. However, there is dearth of qualitative data on adolescent use of e-cigarettes in the country. This study was conducted to explore and gain better understanding on adolescents' perceptions and practices about e-cigarette use. **Methods:** In-depth interviews were conducted with 24 adolescents who self-reported use of e-cigarettes. The participants were recruited from ten municipal schools of Mumbai, India that cater to students from lower socio-economic background. Participants were from 7th to 9th grades, and aged 11-16 years. Data from in-depth interviews were analyzed using inductive thematic analysis. **Results:** Adolescents referred to 'e-cigarette' as 'pen-hookah.' E-cigarettes were perceived as relatively harmless compared to regular hookahs and conventional cigarettes. Initiation was influenced by a friend, peer, or sibling. A variety of flavors, the after-taste, the ability to perform playful tricks with smoke, and fun-time spent with friends were cited as reasons for continued use. Social media influenced both initiation and continuation. Most adolescents' regular use was with a group of friends; the device was shared with or obtained from friends or siblings. Adolescents were unclear about the presence of nicotine in refill liquids and the harmful health effects. **Conclusion:** Increasing awareness among adolescents about the harms of e-cigarettes is urgently required through comprehensive tobacco-prevention programs. More research is needed to examine the role of flavors in increasing acceptability of e-cigarettes and how it affects perceived harmfulness of tobacco products.

Keywords: E-cigarettes- tobacco- adolescents- risk perception- India

Introduction

   Electronic cigarettes, also known as e-cigarettes, e-cigs or Electronic Nicotine Delivery Systems (ENDS), are inhalation devices that deliver an aerosol created by heating a solution, usually composed of propylene glycol or glycerol (glycerin) and flavorings, generally with nicotine (Marques et al., 2021). E-cigarettes, also seen as harm-reduction tools for smokers, have been shown to be beneficial by acting as cessation aids for people trying to quit smoking (National Academies of Sciences, Engineering, and Medicine et al., 2018). However, the aerosol may include cancer-causing chemicals and tiny particles that reach deep into the lungs and could lead to respiratory problems (Campaign for Tobacco-free kids, 2021). Further, dual-users, people who use both e-cigarette and smoking tobacco products, are 3.3 times more likely to develop respiratory illness as compared to a non-smoker who never used e-cigarettes (Bhatta and Glantz, 2020).

   Worldwide, e-cigarette popularity and use among adolescents and children has increased alarmingly (Indian Council of Medical Research, 2019; World Health Organization, 2020). Roughly a fifth of India's population, 236 million, is between the ages of 10-19 years (Office of the Registrar General and Census Commissioner of India, 2011). Use of e-cigarettes has been found to be common among adolescents in the country (Thampi et al., 2018); and around 4% of adolescents aged 15-24 years were reportedly aware of e-cigarettes according to the Global Adult Tobacco Survey (GATS)-2 (Tata Institute of Social Sciences [TISS], Mumbai and Ministry of Health and Family Welfare, Government of India, 2016-2017). Currently there are more than 460 brands of e-cigarettes with over 7,700 different flavors available for use; and e-cigarettes are marketed to youth by promoting flavors through a wide range of media channels, particularly through social media (Pepper et al., 2016). In India, there were 75 companies selling e-cigarettes online (Indian Council of Medical Research, 2019).

   Some researchers argue that e-cigarettes are expanding the tobacco epidemic by bringing lower-risk youth into the fold as e-cigarette use has been found to be associated with greater risk of smoking initiation (Barrington-Trimis et al., 2016; Chaffee et al., 2018; Glantz and Bareham,

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2018; Soneji et al., 2017) and in addition to respiratory problems, the nicotine present in e-cigarettes can make adolescents prone to other addictions. It also harms the developing brain, which can have long-lasting impacts, cause mood disorders, and lead to low impulse-control (U.S. Department of Health and Human Services, 2020). There are also reports of unintended injuries and poisoning due to accidental swallowing of e-cigarette liquid by children (Center for Disease Control, 2021). Are e-cigarettes helpful for certain age-categories such as adult smokers and potentially harmful for others such as young non-smokers? Ongoing research is attempting to clarify our understanding of the balance between benefits and harms of e-cigarettes (Rigotti, 2020).

Meanwhile, a range of regulatory approaches are being applied globally to e-cigarettes with common policies that include a minimum-age-of-purchase, indoor-use (vape-free public places) bans and marketing restrictions (Kennedy et al., 2017). The Department of Therapeutic Goods Administration, Government of Australia recently announced that purchasing nicotine e-cigarette or nicotine vaping products through any website will be possible only with a doctor's prescription. Child resistant closures for nicotine vaping products too will become mandatory to reduce the risk to children of accidental ingestion (Government of Australia, 2021). With the intention of protecting young people from becoming addicted to nicotine, the Indian Government banned e-cigarettes on 18th September, 2019. The Cabinet approved the Prohibition of Electronic Cigarettes Ordinance, which prohibited the manufacture, trade, sale, storage and advertisement of all e-cigarette products with immediate effect and imposed penalties, including jail terms, for offenders (Chakma et al., 2020).

LifeFirst, a school-based tobacco-cessation program, initiated by Narotam Sekhsaria Foundation in coordination with Salaam Bombay Foundation helps adolescent tobacco-users to quit the habit through evidence-based counselling (Bhojani et al., 2021). During the course of implementing this cessation program, e-cigarette availability and use was reported by students. This qualitative study explored adolescents' perceptions and practices to gain a better understanding of e-cigarette use among school-going adolescents.

Materials and Methods

Study Setting and Participants

Mumbai is one of the most densely populated cities in the world, and adolescents constitute roughly a fifth of Mumbai's population of 18 million (Thampi et al., 2018). Schools managed by the local government or Mumbai municipal corporation serve nearly 400,000 students in primary grades (up to 5th) and 60,000 students in secondary (up to 10th) grades (Praja, 2017). These schools serve students from low-income communities, and have similar management structures, teaching staff, curriculum, and academic performance indicators. Purposive sampling was used to recruit participants, consisting of 24 self-identified adolescent users of e-cigarettes, from 7th to 9th grades, across ten municipal schools in Mumbai.

Students, enrolled in LifeFirst tobacco-cessation program, were included in the study based on their willingness to participate and ability to articulate thoughts and ideas about e-cigarette use in their preferred language of Hindi or Marathi.

Data Collection

In-depth interviews (IDIs) were conducted given the sensitive nature of the topic. Twenty-four interviews were divided among two female research facilitators; MD, trained in Anthropology and a Research Assistant trained in Psychology. Both of them were trained for qualitative interviewing techniques and rapport establishment with adolescents. Neither of them was involved in the Life-First programme implementation. They conducted interviews on the school premises face-to-face, in assigned empty classrooms, during working hours. Only one facilitator and one participant were present during each interview session; no teaching staff or non-participants were allowed. At the start of every IDI, the facilitator explained the objectives of the study in the local language of Hindi or Marathi based on the students' preference, and obtained permission before proceeding further or audio recording. Using a semi-structured IDI guide designed by authors NC and HAG, the facilitator started with a conversation around the adolescent's daily routine; knowledge and description of e-cigarettes, availability, and purchase; initiation and reasons for continuing; patterns of use; and harmful effects. Each audio-recorded IDI lasted approximately 30 minutes. Field notes were taken during the interviews and a summary of each interview was documented after the interview. None of the participants dropped out during the interviews. Data collection, conducted over 8 weeks between December 2019 to January 2020, stopped when saturation was reached and no new themes emerged.

Data Analysis

Audio files of IDIs, in Hindi or Marathi, were first transcribed, then translated into English. Two authors (GM and MD), independent of each other, inductively coded and analyzed all the IDI transcripts. No software was used to analyze the data. Thematic analysis of the IDIs included the following steps: becoming well acquainted with each transcript; noting impressions and deriving categories within each section; reviewing and refining categories; developing themes; and reviewing previous steps to derive new themes, commonalities, patterns and differences (Ely et al., 2003). Themes were established both by frequency of occurrence and by importance. Trustworthiness of interpretation was also established by investigator triangulation. The investigators checked analysis notes for agreement on content and coding of themes. Emerging themes or categories were identified and discussed, and any disagreements resolved, in three team meetings. Transcripts and findings of the study were not shared with the participants for corrections or feedback.

Results

Twenty-four participants, 14 males and 10 females, aged 11 to 16 years were interviewed. Duration of

e-cigarette use ranged from two months to three years. Table 1 provides details of age, grade, duration of use, and products ever-used categorized by gender.

Themes, arising from the analysis, are organized in Table 2 under the categories: knowledge about e-cigarettes; initiation of and continued use; patterns of use; and harmful health effects.

A. Knowledge about e-cigarettes

Participants called the device "pen-hookah." Other terms used were: pen-pot, e-hookah, and vape.

"It looks like a pen, it has a button, it can be charged and when the button is pressed then the smoke is released." Female, 9th grade.

Mostly unaware of the governmental ban on e-cigarettes, participants said e-cigarettes were available in shops that sold conventional hookahs, perfumes and gifts; and even in some roadside tobacco shops. However, shop-keepers were cautious; many sold e-cigarettes only to adults.

"It was in the newspaper. That is why the shopkeepers sell it secretly. They do not display up-front. They display pot hookah. If you ask for pot-hookah they give it openly, if you ask for pen-hookah they give it secretly (laughs)". Male, 8th grade.

"It is banned ... but many shops keep it for sale... secretly." Male, 9th grade.

Prices of e-cigarette devices ranged from Indian Rupees (INR) 140 (US\$1.87) to INR750 (US\$10.06). E-cigarette devices and e-liquid flavors were often sold in the same shop. E-liquid costs ranged from INR45 (US\$0.60) to INR180 (US\$2.40). The cost was a barrier for each participant owning a device; and few adolescents, who owned a device, purchased it after trying someone else's. Often older friends were requested to purchase e-liquid as the younger ones were afraid of getting reprimanded. Female participants requested male contacts to purchase on their behalf.

"I persuaded my brother to get it for me." Female, 8th grade.

B. Initiation and continuation of e-cigarette use

Influence of friends, siblings or cousins; curiosity regarding a new device; seeing someone release smoke; and influence of social media were cited as reasons for initiation of e-cigarettes.

"When I was in 7th grade, my friends asked me to try it. They said nothing will happen, so I tried it. I trusted my friends." Male, 9th grade.

"My brother had brought it... so I said – let me try once." Female, 9th grade.

"When someone used a pen-hookah, I saw the smoke and I used to think when will I get a chance to use ... and wonder when will I release smoke from my mouth." Male, 9th grade.

Adolescents mentioned e-liquid flavors and doing tricks, releasing or playing with "smoke" as important reasons for continued use.

"I like the taste of the flavors very much.... and when the smoke is released, and the way it spreads, I that like very much too." Female, 8th grade.

"The smoke is fun. When the user opens their mouth .... magic, magic! When friends watch, they laugh." Male, 9th grade.

Participants preferred e-cigarettes because of the fruity flavors and smells; however, they said conventional cigarettes were more affordable. Participants named a variety of e-liquid flavors: strawberry, chocolate, double-apple, mango, orange, mint, banana, pineapple, magai paan (betel leaf), custard apple, green apple, guava and saunf (fennel). Enjoying the e-liquid flavor was described as the best part of the e-cigarette experience.

"When it went in my mouth it tasted like strawberry, it felt as if I ate a strawberry (laughs). A very good flavor of strawberry which I enjoyed." Female, 9th grade.

Social media also influenced e-cigarette use; some learnt about e-cigarettes by watching TikTok and YouTube videos. Some had uploaded personal videos showing smoke rings on social media sites to get likes from peers.

"You can easily search on You-Tube ... You see people make and release circular rings using pen hookah." Male, 9th grade.

"They do many things using the smoke. Those who have been using for a long time they can make rings. I have seen videos on Tik-Tok." Female, 8th grade.

"When we post photos or videos of e-cigarette smoke, we get likes." Female, 7th grade.

Table 1. Socio Demographic Characteristics and e-Cigarette Use among the Adolescent e-Cigarette Users Recruited from Ten Municipal Schools of Mumbai, India

Variables	Male (n=14)	Female (n=10)	Total (n=24)
Grade			
7th	3	1	4
8th	3	5	8
9th	8	4	12
Age			
11 – 12 years	4	0	4
13 – 14 years	4	8	12
15 – 16 years	6	2	8
Duration of use of e-cigarette			
< 1 year	5	2	7
1 to 2 years	2	4	6
2 to 3 years	4	3	7
More than 3 years	0	1	1
Did not disclose	3	0	3
Products ever used as of date of interview			
Only e-cigarette	2	1	3
e-cigarette + areca nut	3	6	9
e-cigarette + areca nut + pot-hookah	5	3	8
e-cigarette + areca nut + Pot-hookah + chewing tobacco	2	0	2
e-cigarette + regular cigarettes + chewing tobacco	1	0	1
e-cigarette + regular cigarettes + Pot-hookah	1	0	1

Table 2: Themes and Categories with Their Frequency Distribution by Gender Emerging from IDIs Conducted among Adolescent e-Cigarette Users from Ten Municipal Schools of Mumbai, India

Themes classified by section of IDI-guide	Male (n=14)	Female (n=10)	Total (n=24)
A. Knowledge of and availability, purchase of e-cigarettes			
Know that e-cigarettes are banned	4	1	5
Know where e-cigarettes are available	13	5	18
Bought e-cigarette/pen-hookah by going to shop myself	6	0	6
Shopkeepers would not sell me e-cigarette due to age/height	2	1	3
Paid for the e-cigarette and refills with my pocket money/savings	8	0	8
Know different brands of e-cigarettes and the range of costs	8	0	8
Know how to use e-cigarettes	12	5	17
Know how to fill/ refill e-cigarettes	10	3	13
B. Initiation			
First heard/saw peers/someone in locality/school/community using e-cigarettes/pot hookah	8	10	18
Friends or peers (including siblings) initiated me to try e-cigarettes	13	10	23
Friend/sibling lent me their e-cigarette/pen-hookah	12	10	22
I liked the sweet/fruity flavor and taste	11	7	18
Know of others in my school/locality who use e-cigarettes	13	10	23
C. Patterns of use			
Use e-cigarettes with friends/peers/classmates	11	10	21
Use e-cigarette alone	2	2	4
Use e-cigarettes to relieve stress /when I feel pressured	1	0	1
Continued using it because of sweet fruity taste/fresh feeling	11	4	15
Friends have their own e-cigarette/pen-hookah	13	10	23
I have used a brand new e-cigarette/pen-hookah	10	10	20
I lent my e-cigarette to friends who do not have it	3	0	3
Parents/family do not know that I consume e-cigarettes	10	6	16
D. Harms			
I understand the harmful effects of e-cigarettes	6	7	13
I know the difference between e-cigarettes and other tobacco products/conventional cigarettes	13	5	18
E-cigarettes gave me a headache/dizziness/made me vomit/made me feel ill	6	8	14
Adolescents can get addicted to e-cigarettes	7	9	16
Using e-cigarette controls my "talab" or craving	4	4	8

IDI, In-depth interview

C. Patterns of e-cigarette use

Participants used e-cigarettes in a group with friends, siblings, or peers; taking puffs and passing the device to the next person. The experience was fun; they shared stories and jokes.

"Sitting down with friends, talking with them…it is best to vape with friends" Male, 9th grade.

"When using alone it is not fun; with friends it is comedy." Male, 7th grade.

However, using e-cigarettes required planning and coordination. While a few reported using e-cigarettes daily, most participants were occasional users. Participants used e-cigarettes in washrooms or isolated areas of the school; parks; at a friends' or cousin's place; or their own home. E-cigarettes were also used on occasions such as birthday parties.

"We bring it to school sometimes and use it in the school washroom." Male, 9th grade.

Participants were afraid of parental censure and hid the device in a safe place such as the school bag or cupboard where family members rarely looked.

"I kept it in my school-bag; no one touches my bag". Male, 9th Grade.

"I kept it in my cupboard. My brother asked me to hide it from our parents." Female, 8th grade.

"When my family members got to know about it, they warned me saying they will throw me out of the house." Male, 7th grade.

Parents recognized conventional cigarettes and reprimanded adolescents when they saw them smoking. However, because parents seemed unaware of e-cigarettes, adolescents thought they could be fooled by describing the device as just a pen or a toy. One respondent threw a tantrum to buy a device. Her father gave her money thinking it was harmless because it had only flavors.

Few participants thought parents might be aware of their e-cigarette use, but did not warn them because they were afraid that stopping e-cigarettes could lead to use of conventional cigarettes.

D. Harms of e-cigarette use

Participants unanimously said cigarette-smoking was very harmful because of its tobacco content. Conventional hookah was harmful because it was bigger, had more tobacco, and made users high.

"Pen-hookah is pastime and using cigarette means risking life." Female, 9th grade.

"If people smoke pot-hookah then they get high, with a pen-hookah nothing happens, it just feels good." Male, 9th grade.

In comparison, about half perceived e-cigarettes as harmless because they contained only flavors. However, few participants insisted that "tobacco" was mixed in all e-liquid flavors; and harms of e-cigarettes was similar to smoking cigarettes.

"I feel that it is like a cigarette, the smoke released is like a cigarette." Male, 7th grade.

"There is tobacco in that, in any flavor which is available. It is already mixed beforehand". Female, 8th grade.

Few participants differentiated e-liquids into harmless flavors without tobacco and harmful ones that contained tobacco.

"It (tobacco) is not there in some flavors while it is there in others. If you want the tobacco flavor you have to ask – give me the tobacco flavor, then they will give you the tobacco flavor." Male, 9th grade.

"In pen hookah we have an option to choose if we can put tobacco or not. But with cigarette there is already tobacco in it." Female, 9th grade.

Some found no possibility of addiction from e-cigarettes because it contained only fruity flavors and believed they could quit it anytime.

"You can use pen hookah when you want. You can quit when you want." Male, 9th grade.

Even positive effects of using e-cigarettes were reported such as: it refreshes the mind, cleans and cools the throat, makes me feel relaxed and happy.

"It is the thing which brings peace to my heart; I like it very much." Female, 8th grade.

Some participants thought e-cigarettes could be addictive. Few adolescents reported craving, restlessness, irritability, and anger if they did not use e-cigarettes.

"If I do not vape, I feel uneasy …after vaping I feel peaceful and relaxed." Male, 7th grade.

"If I did not vape, I would always get mad… get too angry. That flavor…there is something in that flavor, which gets you addicted." Male, 9th grade.

"There is tobacco in the flavor and that causes addiction." Female, 8th grade.

Discussion

This qualitative study is one of the first in India to explore adolescents' perceptions and practices related to e-cigarettes. Despite the government-imposed ban, study participants had access to e-cigarettes and refill liquids and believed they were less harmful than cigarettes. Perceptions of e-cigarettes were influenced by sensory characteristics such as variety of flavors. Sweet and fruity flavors and the fun of group use were cited as a primary reason for continued use. The fun element emerged from the ability to create smoke rings or do tricks with the smoke; often learnt from social media videos. Adolescents uploaded video clips or photographs of their own smoke tricks and the 'likes' from peers on social media made them feel good. Except for three participants who used only e-cigarettes, the rest used e-cigarettes along with other products such as areca nut, hookah, cigarettes or chewing tobacco.

Almost all participants had initiated use after seeing a friend or a sibling use the device. E-cigarette use was a group activity with friends in settings such as the school, public park or at someone's home. It was considered enjoyable; there was joking, sharing, competitions of smoke tricks with cheering. These findings are similar to a US-based study, where adolescents initiated use with friends or siblings in similar settings (Alexander et al., 2019); and those with friends using e-cigarettes perceived e-cigarette use as having a positive social effect (Wallace and Roche, 2018).

In this study, participants judged a product (cigarettes, chewing tobacco, hookah) as harmful based on the presence of tobacco. Fruity flavors created the perception that e-cigarettes did not contain tobacco and hence were less harmful. Other studies have found that adolescents believe e-cigarettes are less harmful, safer than or even a healthy alternative to conventional cigarettes, and that e-cigarettes are not a tobacco product (Amrock et al., 2015; Gorukanti et al., 2017; Park et al., 2019); they perceive fruit-flavoured e-cigarettes are less harmful than tobacco-flavoured ones (Pepper et al., 2016); and mention the negative consequences of cigarette use but describe benefits of e-cigarette and marijuana use (Roditis and Halpern-Felsher, 2015). The perception that e-cigarettes are less harmful than conventional cigarettes is associated with increased e-cigarette use, including among cigarette-naive e-cigarette users (Amrock et al., 2015).

This study, conducted a few months after the government ban was imposed (Chakma et al., 2020), found participants barely aware of this regulation. Participants reported that many shops sold e-cigarettes clandestinely. Indian media reports have also found that e-cigarettes are easily purchased from 'paan shops' (that sell betel leaf and cigarettes) and on the internet (Soni, 2020). While India has laws on tobacco sale to adolescents, enforcement has generally been weak. Compliance assessment studies have found widespread violation of laws regarding ban on sale of tobacco products to and by minors and sale of tobacco

products within 100 yards of educational institutions (Elf et al., 2013; Ministry of Law and Justice, 2003; Rimal, 2013). Similarly, assessments of adherence to Ministry of Health and Family Welfare (MoHFW) directed guidelines for tobacco-free schools found only one in ten schools to be fully compliant (Chatterjee et al., 2017; Ministry of Health and Family Welfare, 2020).

Findings of this study should be interpreted cautiously. The study sample was small and not nationally representative. There are differences between study participants, who were non-randomly and conveniently selected, and other adolescents in Mumbai or the rest of India making generalizability difficult. Participants had been exposed to at least one orientation session on tobacco prevention in their respective schools; and they knew that the researchers were from a tobacco-cessation organization; therefore, some responses could be socially desirable. In addition to evaluation of enforcement of the legislation; future studies with nationally representative samples could assess adolescents' e-cigarette use and perceived harms, including the role of flavors.

In conclusion, while the international debate on balancing the role of e-cigarettes as a cessation or harm-reduction tool vis-à-vis their potential harmful influence on adolescents is yet to reach a conclusion, policymakers have to monitor enforcement of existing laws and re-examine government policy on flavoring in products with addictive potential especially from the perspective of adolescents. Health educators need to design appropriate programs for adolescents and communities to understand, prevent and control addiction to nicotine. Tobacco-prevention and cessation programs have to include correct information about e-cigarettes for adolescents, and also provide appropriate e-cigarette cessation counselling and help.

Author Contribution Statement

HAG conceptualized the study design. NC and HAG worked on the methods. HAG and GM responsible for implementation and participant recruitment. MD conducted the interviews. GM and MD performed coding, data analysis and data interpretation. HAG and NC wrote the first draft of the manuscript. All authors took an active role in critical revision of the manuscript for important intellectual content.

Acknowledgements

Approval by Scientic Review Committee
Reviewers of the Scientific Review Committee of

Narotam Sekhsaria Foundation and Salaam Bombay Foundation approved this study.

Ethical considerations
The Institutional Ethical Review Board of Narotam Sekhsaria Foundation and Salaam Bombay Foundation approved this study. Permissions were obtained from school principals, followed by written consent from the participant's parents, who were informed about the purpose of the study, procedure, risks, and confidentiality. Students were informed about the study, assured about confidentiality, and their verbal assent was sought before the IDI.

Availability of Data
Not Applicable

Conflict of interest
The authors have no conflicts of interest to disclose.

References

Alexander JP, Williams P, Lee YO (2019). Youth who use e-cigarettes regularly: A qualitative study of behavior , attitudes , and familial norms. *Prev Med Rep*, **13**, 93–7.

Amrock SM, Zakhar J, Zhou S, Weitzman M (2015). Perception of e-cigarette harm and its correlation with use among U.S. adolescents. *Nicotine Tob Res*, **17**, 330 - 6.

Barrington-Trimis JL, Urman R, Berhane K, et al (2016). E-Cigarettes and future cigarette use. *Pediatrics*, **138**, e20160379.

Bhatta DN, Glantz SA (2020). Association of e-cigarette use with respiratory disease among adults: A Longitudinal Analysis. *Am J Prev Med*, **58**, 182–90.

Bhojani U, Varma A, Hebbar PB, Mandal G, Gupte H (2021). Life First: Impact of a school-based tobacco and supari cessation intervention among adolescent students in Mumbai, India. *Popul Med*, **3**, 12.

Campaign for Tobacco-free kids (2021). Electronic cigarettes and youth.[Online]. Available at: https://www.tobaccofreekids. org/assets/factsheets/0382.pdf (Accessed 24.05.2022).

Center for Disease Control (2021). About Electronic Cigarettes (E-Cigarettes). [Online]. Available at: https://www.cdc.gov/ tobacco/basic_information/e-cigarettes/about-e-cigarettes. html (Accessed 24.05.2022).

Chaffee BW, Watkins SL, Glantz SA (2018). Electronic cigarette use and progression from experimentation to established smoking. *Pediatrics*, **141**, e20173594.

Chakma JK, Kumar H, Bhargava S, Khanna T (2020). The e-cigarettes ban in India: an important public health decision. *Lancet*, **5**, e426.

Chatterjee N, Kadam R, Patil D, Todankar P (2017). Adherence to the tobacco-free school policy in rural India. *Asian Pac J Cancer Prev*, **18**, 2367–73.

Elf JL, Modi B, Stillman F, Dave P, Apelberg B (2013). Tobacco sales and marketing within 100 yards of schools in Ahmedabad city, India. *Public Health*, **127**, 442 – 8.

Ely M, Anzul M, Friedman T, Garner D, Steinmetz AM (2003). Doing qualitative research: Circles within circles,. In 'Doing', , The Falmer Press, London and Philidelphia, pp 150-2.

Glantz SA, BarehamDW (2018). E-Cigarettes: Use, effects on smoking, risks, and policy implications. *Annu Rev Public Health*, **39**, 215– 35.

Gorukanti A, Delucchi K, Ling P, Fisher-Travis R, Halpern-

Felsher B (2017). Adolescents' attitudes towards e-cigarette ingredients, safety, addictive properties, social norms, and regulation. *Prev Med*, **94**, 65–71.

Government of Australia, Department of Health , Theraputic Goods and Administration (2021). Nicotine vaping laws are changing. [Online] Available at: https://www.tga.gov.au/blogs/tga-topics/nicotine-vaping-laws-are-changing (Accessed 24.05.2022).

Indian Council of Medical Research (2019). White Paper on Electronic Nicotine Delivery System. *Indian J Med Res*, **149**, 574-83.

Kennedy RD, Awopegba A, León E De, Cohen JE (2017). Global approaches to regulating electronic cigarettes. *Tob Control*, **26**, 440 –5.

Marques P, Piqueras L, Sanz MJ (2021). An updated overview of e-cigarette impact on human health. *Respir Res*, **22**, 151.

Ministry of Health and Family Welfare, Government of India (2020). Guidelines for Tobacco Free Educational Institution (Revised) [Online]. Avaiable at: https://ntcp.nhp.gov.in/assets/document/TEFI-Guidelines.pdf (Accessed 24.05.2022).

Ministry of Law and Justice, Government of India (2003). The cigarettes and other toacco products (Prohibition ofadvertisement and regulation of trade and commerce, production, supply and distribution) act, 2003 [Online]. Available at: https://legislative.gov.in/sites/default/files/A2003-34.pdf. (Accessed 24.05.2022).

National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems (2018). Public Health Consequences of E-Cigarettes. In 'Harm Reducation',Eds Eaton DL, Stratton K, Kwan LY National Academies Press, United States, pg 596.

Office of the Registrar General and Census Commissioner of India (2011). Census of India 2011. Census of India Website [Online]. Available at: https://censusindia.gov.in/census.website/data/census-tables (Accessed 24.05.2022).

Park E, Kwon M, Gaughan MR, Livingston, JA, Chang, YP (2019). Listening to adolescents: Their perceptions and information sources about e-cigarettes. *J Pediatr Nurs*, **48**, 82–91.

Pepper JK, Ribisl KM, Brewer NT (2016). Adolescents' interest in trying flavoured e-cigarettes. *Tob Control*, **25**, 62–6.

Praja (2017). State of Municipal Education in Mumbai. [Online] Available st: https://www.praja.org/praja_docs/praja_downloads/State%20of%20Municipal%20Education%20in%20Mumbai.pdf (Accessed 24.05.2022).

Rigotti NA (2020). Randomized trials of e-cigarettes for smoking cessation. *JAMA*, **324**, 1835 – 7.

Rimal R (2013). Compliance with the Cigarette and Other Tobacco Products Act (COTPA) Results from 2012 and 2013: Maharashtra. [Online]Available at: https://globaltobaccocontrol.org/sites/default/files/2021-05/FS_2013_COTPA_maharashtra.pdf (Accessed 24.05.2022).

Roditis ML, Halpern-Felsher B (2015). Adolescents' perceptions of risks and benefits of conventional cigarettes, E-cigarettes, and Marijuana: A Qualitative Analysis. *J Adolesc Health*, **57**, 179 – 85.

Soneji S, Barrington-Trimis JL, Wills TA, et al (2017). Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults: A Systematic Review and Meta-analysis. *JAMA Pediatr*, **171**, 788 – 97.

Soni P (2020). India's e-cigarettes ban hasn't stopped vaping-it only drove out Juul and Vape - Business Insider India. Business Insider India [Online]. Available at: https://www.businessinsider.in/india/news/indias-e-cigarettes-ban-hasnt-stopped-vaping-it-only-drove-out-juul-and-vape/articleshow/76093490.cms (Accessed 24.05.2022).

Tata Institute of Social Sciences (TISS)-Mumbai, Ministry of Health and Family Welfare (Government of India). Global Adult Tobacco Survey GATS 2 India 2016-17. [Online]. Available at: https://ntcp.nhp.gov.in/assets/document/surveys-reports-publications/Global-Adult-Tobacco-Survey-Second-Round-India-2016-2017.pdf (Accessed 24.05.2022).

Thampi V, Nair R, Rawat R, Makhaik A, Dey S (2018). A review study on vaping and status of vaping in India. *J Cancer Clin Trials*, **3**, 147.

U.S. Department of Health and Human Services (2020). Re: Smoking Cessation: A Report of the Surgeon General. In Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. [Online].Available at: https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf (Accessed 24.05.2022).

Wallace LN, Roche MJ (2018). Vaping in Context: Links among e-cigarette use, social status, and peer influence for college students. *J Drug Educ*, **48**, 36–53.

World Health Organization (2020). E-cigarettes are harmful to health. [Online]. Available at: https://www.who.int/news/item/05-02-2020-e-cigarettes-are-harmful-to-health (Accessed 24.05.2022).