

## Mapping of Tobacco Harm Reduction in Pakistan: An Alternative Option for Smoking Cessation Policies

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### Abstract

A high percentage of the Pakistani population between the ages of 25 and 35 years use the combustible smoking method compared to the tobacco harm reduction (THR) products, e-cigarettes, JUUL, and smokeless tobacco. Some of the challenges include high prices of e-cigarettes, regulatory challenges, and limited supply of refills exist. Although the adult smokers in Pakistan do know about the health issues, they are hardly assisted when it comes to quitting smoking and there are no cessation facilities. There is a strong influence of social forces on the perceptions of vaping, which often distracts reality facts about THR products. Barriers that impede the acceptability of THR in Pakistan are lack of knowledge, lack of information among the uneducated members of the society and societal aspects. These challenges need complex approaches that involve education and changing social perceptions in order to counter them. To form a more solid understanding of THR options, there should be an attempt to invest in the comprehensive education programmes, as well as specific informational campaigns. Strict rules governing the production, sale, and use of the vaping products should be established based on the demands of vapers to ban it and employing the services of the health professions in the training and awareness initiatives. As it has been observed in the media, THR discourses are the reserve of English newspapers, despite the fact that Urdu is the national language and is also popularly spoken as a second language. The informal information must inform the efficacy of THR products in level reducing the use of combustible cigarettes and health benefits.

**Keywords:** Tobacco Harm Reduction, Combustible Smoking, Smoking Cessation, Public Health, Pakistan.

### Introduction

More than eight million people die of tobacco pandemic throughout the world every year. There are 1.3 billion of the global population who consume tobacco are found in the low and middle-income nations where the toll of the morbidity and mortality due to tobacco use is the most critical hence worsening health inequities [1-2]. In the developed world, smoking prevalence has decreased since the 1970s because of the application of extensive tobacco control programs. This reduction can be linked to more awareness among the people on the importance of health, establishment of smoke free centers and introduction of control measures like pricing, legislation and taxation [2]. However, the increasing population of the world is leading to the increased total number of smokers across the world [3]. It is important to mention that smoking is among the leading causes of multiple health complications, such as liver, oral and throat cancer, chronic obstructive pulmonary disease (COPD), heart conditions, and stroke, which are especially notorious in such nations as India, Bangladesh, and Pakistan [4].

Pakistan is a country of high prevalence of disease related to tobacco use with fifteen countries. Pakistan has not undergone any national survey on a large scale since 2014 to carry out a systematic monitoring of the adult tobacco use as well as to measure the key tobacco control indicators. The Global Adult Tobacco Survey (GATS) is an internationally acknowledged standard survey that was conducted in 2014 and its metadata was released in 2018. This survey gained national representation, according to the Government of Pakistan and the donor agencies and a total of 9,856 households were involved. Out of them, 7,831 individual interviews were completed successfully, which gave a total response rate of 81%. According to the survey report, 31.8% of men, 5.8% of women and 19.1% (equivalent to 23.9 million adults) of the total population were current users of tobacco in this different form or the other. In particular, there were 22.2% men, 2.1% women, and 12.4% adults (15.6 million adults) who were current smokers. Further, 11.4% of men, 3.7% of women and 7.7%, on the whole (9.6 million adults) reported present use of smokeless tobacco. Besides, 4.7% of males, 1.1% of females and 3.0% of the total (3.7 million adults) were current water pipes (hookah/shisha) users [5].

Pakistan is reportedly a high-burden country of tobacco and 31 million adults are currently consuming tobacco in one form or another according to a recent study. According to the estimation provided by Household Integrated Economic Survey (HIES) conducted in 2018-19 in Pakistan, it was found that tobacco use is widespread in more than 45% of households in the country. There is a slight variation in the ratio across various socioeconomic classes with 49% being the poor households and 38% being the wealthy households [6].

Some of the major milestones in awarding to world health organization [7] has been in the framework of the Prohibition of Smoking and Protection of Non-smokers Health Ordinance 2002 in addition to the Ratification of WHO Framework Convention on Tobacco Control (FCTC) cigarette packs and outers, the Notified Pictorial Health Warning that demands high tax payer income. The FCTC requires the size of the warning to be 85%. It is not allowed to smoke in the open or when using the public transport. Sale of cigarettes to minors is also not allowed. Posters with No Smoking signs have to be provided in social places. Advertising can no longer advertise tobacco and other smoking materials in print and electronic media (i.e. billboards, posters, banners and other types of advertisements that are placed outside stores, kiosks, mobile carts etc.) Importation Shisha (both non-tobacco and tobacco) and other associated materials cannot be imported anymore. Ban on the manufacture, importation, and sale of cigarette packets that have less than 20 cigarettes. Banning of free samples, discounts, cash back and event sponsorship.

Moreover, the cessation of smoking remains one of the weakest areas in the tobacco control strategy. Nicotine replacement therapy (NRT) was included in the Essential Drugs List in Pakistan as early as 2017. The availability of NRTs is low in Pakistan. Pakistan has a single smoking cessation clinic in an Islamabad state hospital. The Quitline has now been established but it is not widely publicized. It has remained bad performer. The number of calls made to the Quitline between January, 2015 and September, 2020 was 2,371. Among the registered smokers using the Quitline 2,371 and 1,439 smokers were referred to the National Institute of Rehabilitation Medicine (NIRM) with only 73 smokers managing to stop smoking over the past five years. There were another 932 callers who got online consultations. Pakistan has one of the lowest quit smoking rates at less than 3% per annum.

Regardless of these efforts and achievements, smoking is the greatest preventable cause of death in Pakistan. Approximately 160,100 deaths of tobacco are caused annually in Pakistan. These are cancer of the lung, trachea, and bronchus (66.5% of all deaths); chronic obstructive pulmonary disease (53.2% of all deaths); ischemic heart disease (21.9% of all deaths); diabetes mellitus (15.2% of all deaths); and stroke (16.8% of all deaths). All these deaths are indirectly linked to the consumption of tobacco [8]. In 2019, all smoking-related morbidity and mortality incurred in Pakistan were estimated to cost 615.07 billion rupees (Rs. 3.85 billion) and 70% of the total cost

was the indirect cost (morbidity and mortality). The rural inhabitants pay 61% of the total price, men 77%, and individuals between the ages of 35 and 64 years pay 86% of the total price [9].

To manage the challenging issues of smoking cessation and reduce the negative impact of combustible smoking, the world is increasingly resorting to the ancient concept of harm reduction. The society has acquired the means to reduce the negative impact of remaining in a situation where they are involved in a risky behavior courtesy of science, technology and improvements in regulations. The concept of harm reduction is one that recognizes the fact that the risk of harm may not have been removed completely but it is nonetheless better than the persistence of the initial damaging behavior. Consider the example of electric cars, say. They carry the passengers the same way as their gasoline starved ancestors but generate way less pollutants in between. Similarly, THR does not ask people to stop smoking but, to minimize or avoid the damage caused by the toxins formed by tobacco burning, it asks that they limit or stop smoking [10]. Three types of products can be used in this purpose in the modern world, namely, snus (a variant of smokeless tobacco), e-cigarettes (also known as vapor products), and heated tobacco products (also known as heat-not-burn devices). Cases of corroborating evidence which suggest harm mitigation that these products will provide are presented depicting lower degrees of toxicity in these substitutes compared to the conventional cigarette smoking [11].

Smoking can be stopped through tobacco harm reduction. But the style is distrusted by most. This is mainly due to suspicion on the role of the tobacco industry in the manufacture of some of the safer nicotine products. The argument on whether tobacco harm reduction has a role to play in assisting individuals to quit smoking, whether nicotine should be used by adults, and whether safer nicotine products would pose a threat to adult is splitting the health policy community and policymakers. Tobacco cigarette, the deadliest type of the nicotine delivery system that is usually legal, has been damaging more than a billion adults on a daily basis despite the debate.

Following the pattern in other fields of public health, risks tend to have nonlinear distribution and disproportionately impact socially and economically vulnerable groups, meaning that policies fail to account for differences in exposure and access to protective measures are not likely to decrease the overall harm [60-61]. The reality is that the genie is already out of the bottle: a significant disruptive force is in the play. Various less harmful nicotine products have not only established evidence bases that these products are less harmful than smoking cigarettes, but are also popular with consumers. But, disparities in the areas of politics and health of the population are hindering progress. It cannot be understood to prohibit less harmful nicotine products and leave deadly combustibles on sale. Ultimately, it will succeed in nothing, and give rise to just the same unforeseen consequences as the drug war and banning alcohol. Tobacco is the primary business that is deeply rooted, and there are more than a billion customers buying cigarettes. It is able to sit back and see the tobacco harm reduction battle unfold.

Powerful harm reduction measures, of which governments will need small financial resources in addition to health organizations, can eliminate smoking in a period of time (generation). On the other hand, the continuation of the inefficient practices will always underprivilege the most vulnerable, and the cost will be in terms of the number of lives that could have been saved [12].

#### Study Objectives

The primary goals of this scoping/ mapping paper are:

- To stay informed of the country, the priorities of the public health, THR documentation and legal status and barriers.
- To examine aspects of acceptance, availability and prices of THR.
- To determine the THR state in Pakistan, the number of products, the geographical coverage of outlets in the country, the number of users and their socioeconomics.

#### Study Significance

The study under scoping/ mapping is significant as the need to conduct a comprehensive assessment and treatment of all subjects of THR in Pakistan. The analysis of product availability, acceptance, and cost of THR in the study is very crucial. The needs of understanding market issues that affect the acceptability of the products and their costs inform strategies to enhance the availability and affordability of THR choices to users. A better understanding of the variables that influence user acceptance will allow tailored marketing and instructional initiatives to persuade THR decisions effectively. It tries to make evidence-based decision-making possible by providing a comprehensive, multifaceted image of THR in Pakistan. To the stakeholders, the healthcare givers and the legislators, the data collected serves as a strategic paddle as it guides them toward the path of actions and interventions that will reduce the ill effects of using tobacco.

### Literature Review

Tobacco products, such as cigarettes, water pipes, shisha, pan, gutka, and niswar are used by people in Pakistan [13]. In Pakistan, the tobacco smokers are approximately 23.9 million. Other estimates show that it is more than 24 million. Figure 1 clearly shows that the percentage of tobacco prevalence in Pakistan rose with age. Already having a population of more than 29 million people, who consume tobacco in one form or another, Pakistan bears an enormous burden of tobacco consumption. In the Household Integrated Economic Survey (HIES) 2018-19, 45% of Pakistani households use tobacco. This figure is particularly 49% in the case of poor households and 38% in that of rich households. The number of sticks smoked by households per month (monthly cigarette consumption) grew by 27% between 2015 and 2019 (see Fig. 2) [20].

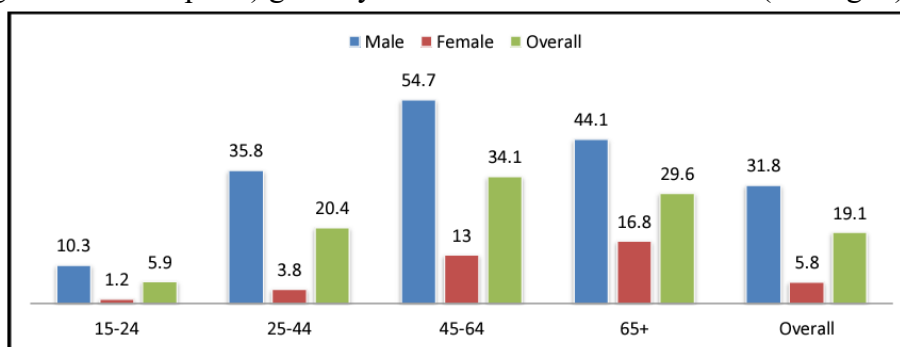


Figure 1: Prevalence of tobacco smoking among adults 15-65+ years of age

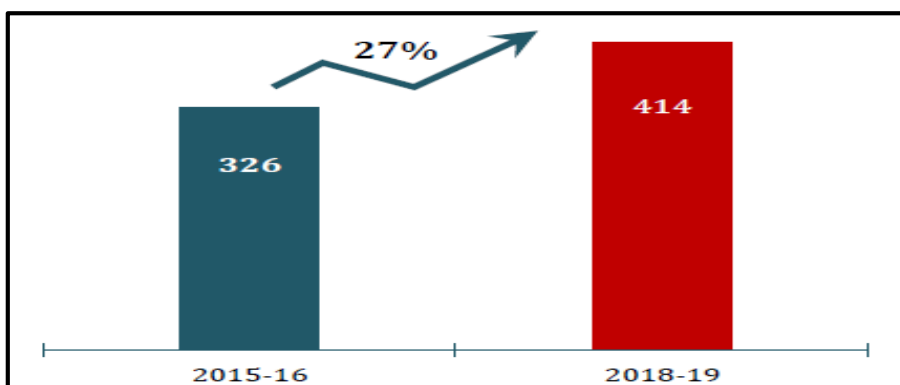


Figure 2: Monthly consumption of cigarettes per household (number of sticks)

There was data on exposure to second-hand smoke (SHS) in a diverse range of social situations published in the National Institute of Population Studies (NIPS) and ICF in 2019 [14] and in the 2014 Global Adult Tobacco Survey (GATS) [3]. The SHS has been practiced by the 64.6% in the government settings. In regards to the exposure levels, they were observed in health institutions,

at 37.6% and 86% of the SHS cases were observed in the civilians, like restaurants. The other significant exposure was the public transport exposure that had an effect of 76.2% (see Figure 2). These findings point to a large-scale issue: a considerable portion of the population, either gender-based, is habitually exposed to SHS in places of representation like government facilities, hospitals, restaurants and transportation.

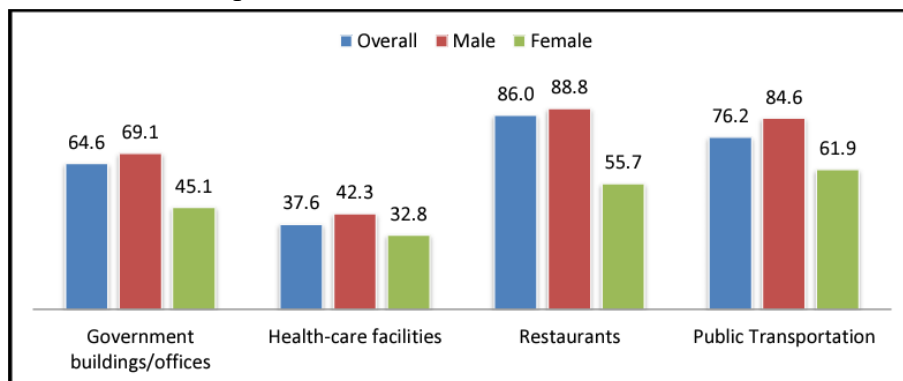


Figure 3: Exposed to second-hand smoke in Pakistan, 2014

### Tobacco Economic

The Pakistani Government owns the Pakistan Tobacco Company which reports that 0.23% of all the irrigated land in Pakistan is used to grow tobacco. The crop contributes greatly to the economy of the country since it has been a source of income and employment at different levels such as in tobacco cultivation, production, distribution, and retailing. About 50,000 growers of tobacco are engaged in the growth of tobacco in Pakistan. Out of this number, some 23,964 growers are located in Khyber Pakhtunkhwa and mainly they produce 98% Flue Cured Virginia (FCV) on a total land area of about 27,036 hectares dispersed over such districts as Swabi, Mardan, Charsadda, Buner, and Mansehra. Each year, the average production of these districts is an average of 70-75 million kilograms of FCV which is the main ingredient used to make cigarettes. In addition, the tobacco industry is a huge contributor to the government income as it paid close to 124 billion Federal Excise Duty/ Sales Tax in fiscal year 2019- 20, demonstrating that it is a force to reckon with as a source of good income to the economy [15].

### Economic Burden of Tobacco

Economical and health effects of tobacco in Pakistan are causing huge costs especially the three major diseases that have been related to smoking which include: cancer, cardiovascular diseases (CVD), and respiratory diseases. All these diseases contribute to an overall cost of PKR 437.76 billion, approximating about 71% of the total economic and health cost occasioned by tobacco. Disaggregating these costs, a quarter of them is direct costs, less than two-thirds of which are indirect mortality costs, and the other one-eighth indirect morbidity costs. Further breakdown of these estimates indicates that almost two out of three of such financial burden is borne by those who live in rural places. Furthermore, about 9 out of ten of these expenses are borne by males and more than four-fifths is borne by a citizen aged 35-64 years old [16].

The total expense of smoking in Pakistan is almost 1.6% of the national Gross Domestic Product (GDP), compared to the total expense of the three leading diseases related to smoking, which is approximately 1.5% of the GDP in Pakistan. In another study that had been conducted on the same major diseases in the past, the estimated cost was approximated to be about 0.40% of the GDP of Pakistan [17].

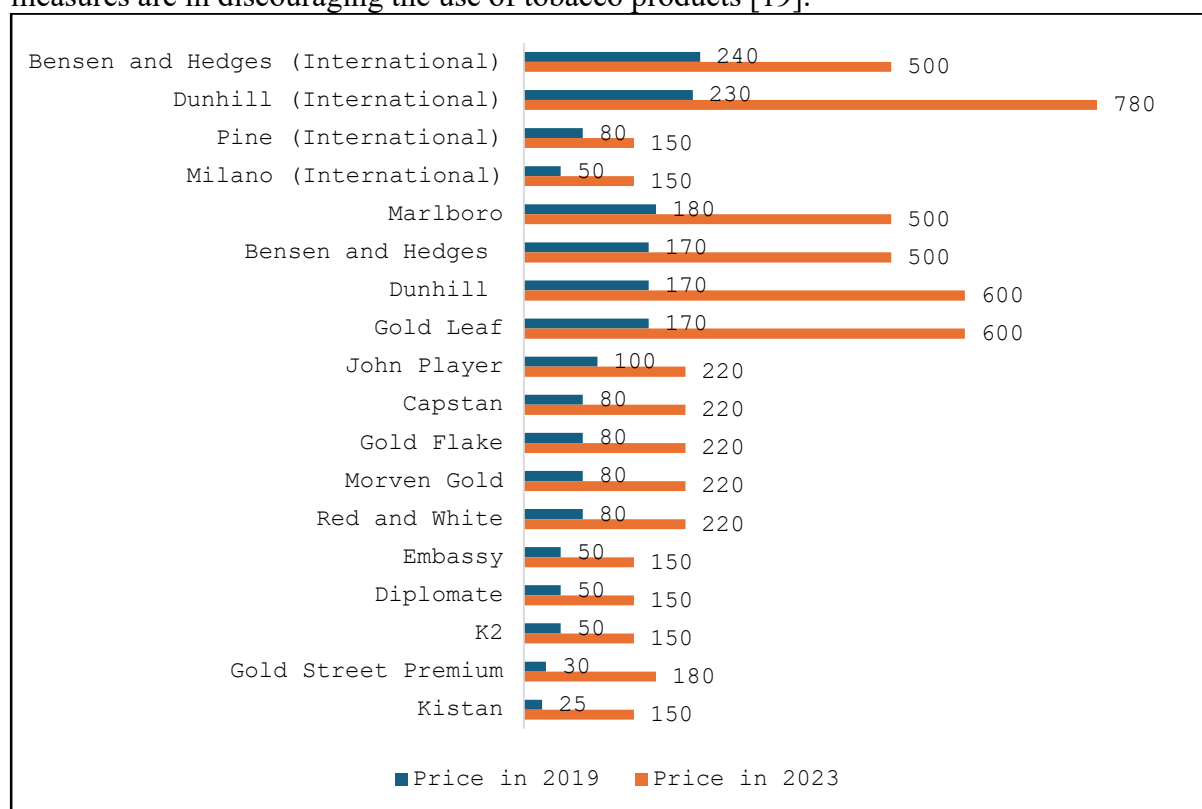
During the fiscal 2018-2019, the amount of revenue collected through tobacco taxation, primarily through cigarettes, was RS 120 billion. Thus, society bears the economic and health cost of smoking to the tune of three or four times more than the total amount of tax the tobacco industry

pays. This is an indication of a huge gap between the expenses incurred due to smoking related problems and the amount of tobacco taxes. Moreover, direct costs that can be related to smoking amount 8.3 % of total expenditures on health, which represents a rather significant burden on healthcare expenditures caused by health issues, which are caused by smoking [18].

## Price, Taxation and Legislation for Tobacco Control

### Price

Pakistan has seen a recent announcement by the tobacco industry that they are going to increase the cigarette prices by a substantial amount, which will be an increase of 250% per pack. This has been decided following the introduction of a PKR170 billion (\$649.190 million) minibudget by the government. As a result, there is an increase in retail prices of different well-known cigarette brands like Marlboro, Gold Leaf, Capstan, and Gold Flake. The lowest priced of such brands is now being sold at 211 per pack and the highest priced at 522-525 per pack. Such price increases have been praised by the supporters of community health, who highlight how effective these measures are in discouraging the use of tobacco products [19].



Source: Author's personal visits outlets and print media

Although this has been received positively, there have been some concerns by critics about the possible effect of the new FED increments on sustainability of legal tobacco firms. According to them, these companies are struggling to keep their sales at a low level and this has threatened their existence. Moreover, there have been contributions of some observers that the tobacco industry has increased prices beyond the necessary changes of tax increase. It has also been criticized that the industry has a plan of drastically increasing the consumer rates, especially on the more expensive products, than the reality of the cost increase of the tax increase. At the same time, the industry has carried the tax burden on cheaper products to result in increased differences in the differentials in the price per packet.

## Legislation

Tobacco control in Pakistan has been mostly comprised by ordinances. The Smoking and Non-smokers Protection and Prohibition Ordinance 2002, which was passed under the fourth military regime, is considered a turning point. This law has banned smoking in the public, restricted advertising of tobacco products, banned the sale of cigarettes to children and imposed regulations on the storage, sale and distribution of cigarettes in the areas surrounding educational institutions. Also, in 2002 the government was empowered to substitute the existing health warnings on cigarette packs with stickers with specific warnings on the packets under the Cigarette (Printing of Warning) (Amendment) Ordinance [21].

In 1979, under the third military administration, the Cigarettes (Printing of Warning) Ordinance 1979 was passed in which health warnings were printed on every cigarette pack and tobacco advertisement was first introduced. Although these are made, it is important to emphasize the lack of tobacco control laws that are passed by an elected legislature in Pakistan. One remarkable case was the tobacco control law submitted to the provincial legislature of Khyber Pakhtunkhwa in October 2016 and was written with the WHO technical support, and lapsed with the term of the assembly in 2018. This action was phased out as a result of the counteractions of the cigarette manufacturers and tobacco farmers [21].

## Empirical Review

There is a rich empirical literature review on the efficacy of e-cigarettes used as a stand-alone intervention or as an adjunct to nicotine replacement therapy (NRT) and behavioral support as a smoking cessation method. This evidence base is mainly dominated by randomized controlled trials (RCTs) and pragmatic trials whose findings are still mixed.

Some RCTs have directly compared the use of e-cigarettes to conventional NRT. Preliminary results of a three-arm randomized trial comparing nicotine e-cigarettes versus nicotine patches versus placebo e-cigarettes demonstrated that both nicotine and non-nicotine e-cigarettes had only slightly superior cessation results when compared to nicotine patches, besides raising a question mark regarding adverse effects and unclear effects on public health [22]. However, a large multicenter pragmatic RCT with an 884-patient sample revealed greater one-year abstinence rates in smokers in the e-cigarette group than in those in NRT group, based on biochemically detected results and generalized linear models [23].

Neutral results are encountered in other controlled trials. In a single-centre two-arm RCT, Lee et al. [24], found no statistically significant difference in short- and medium-term abstinence between e-cigarettes and nicotine gum, although e-cigarettes were rated by the participants as being acceptable. On the same note, Bonevski et al. [25] discovered that Quitline counseling was better than Quitline support with nicotine vaping product, but dual users reported less cravings and withdrawal symptoms. It has been hinted in evidence that the nicotine patches plus the nicotine-containing e-cigarettes could be of a slight benefit in increasing the cessation rates of nicotine patches, as opposed to nicotine patches only, with no immediate safety issues. Smith et al. [27] also showed that e-cigarettes were better than NRT in long-term reduction of smoking and abstinence in smokers who had experienced the previous unsuccessful quit attempts.

In addition to pharmacological substitution, some studies focus on behavioral counseling and placing the context in the background. Chiang et al. [28], dedicated to pregnant smokers, showed channeled impacts of e-cigarette smoking in association with text-based advice, showing decreases in cigarette smoking and dangers, which is why care in the interpretation of the problem is particularly justified in vulnerable groups. A study by Rigotti et al. [29] investigated the post-hospitalization smokers and discovered that the use of e-cigarette was prevalent during their quit attempts though lower abstinence rates six months later were noted when the propensity score

matching was used to analyze the findings. This observation contradicts the notion that the use of e-cigarette is the only way to achieve permanent quit.

E-cigarettes have also been compared to financial and behavioral incentives. Halpern et al. [30] demonstrated that monetary incentives were better in maintaining abstinence than free cessation assistance, such as e-cigarettes, implying that the motivation mechanisms sometimes dominated over the device-based interventions. Masieri et al. [31] reported that e-cigarettes have the ability to decrease cigarette and even improve respiratory symptoms among even the smokers who were not highly motivated to quit, and that they can have a harm-reduction effect in clinical practice. Studies have also been done on different user populations and nicotine content differentiation. Martinez et al. [32] proved that among dual smokers of combustible and electronic cigarettes, tailored self-help materials used along with the use of e-cigarettes contributed to a significant improvement of the quit results. By conducting a three-arm RCT (long-term) study, Caponnetto et al. [33] discovered that nicotine and non-nicotine e-cigarettes effectively diminished the conventional cigarette smoking and ensured a longer-term abstinence, even in smokers who were not willing to quit in the first place. In young adults, Tseng et al. [34] found significant decreases in smoking cigarettes with nicotine-containing e-cigarettes but the authors requested additional trials to understand placebo and long-term results. Lastly, Walker et al. [35] demonstrated that low-nicotine cigarettes together with NRT and Quitline counseling produced better quit results in certain smokers and supported the importance of integrated cessation programs.

On the whole, empirical data indicate that e-cigarettes may be equally and, in some situations, even more effective than traditional NRT in facilitating smoking cessation or reduction. Nevertheless, the results differ considerably depending on the study design, population, support of behavior, and nicotine. Even though certain studies prove the importance of e-cigarettes as a harm-reduction or cessation tool, also they show possible limitations, such as less abstinence in the long term and unknown population-wide benefits. Therefore, the literature promotes the careful, situation-based adoption of the use of e-cigarettes within the aggregate tobacco-control and smoking-cessation models as opposed to its blanket acceptance.

## Materials and Methods

### Data

This study used qualitative (in-depth interviews) technique to understand and explore its objectives. To understand the country's context, THR documentation and legal status, barriers, factors of acceptance, availability, and prices, the qualitative (in-depth interviews) survey will be conducted with stakeholders, including THR suppliers, tobacco control advocates, public health experts and media analyst at the national and regional levels. Approximately 20 in-depth key informative interviews (KIIs) will be conducted with the stakeholders and 40 KIIs with THR sellers and users from the metropolitan areas of major cities, including Islamabad, Rawalpindi, Lahore, and Karachi. The qualitative information was gathered using the sample distribution outlined below.

Table 1: Sample Size

Stakeholder's	Islamabad	Rawalpindi	Lahore	Karachi	Total
Vape Seller	5	5	5	5	20
Vape Consumer	5	5	5	5	20
Tobacco Control Expert	1	1	1	1	4
Media Health Reporter	2	2	2	2	8
Public Health Expert	2	2	2	2	8
<b>Total</b>	15	15	15	15	60

## Methods

A basic qualitative thematic and content analysis was conducted to evaluate and address the study's objectives. This analysis involved the examination and interpretation of themes and content within the collected data to gain a deeper understanding in line with the study's aims and goals.

## Results

### Challenges and Barriers for Smoking Cessation in Pakistan

This section provides a comprehensive summary of the challenges and barriers to smoking cessation in Pakistan as perceived by various stakeholders, including the media, vape users, vape shop owners, tobacco control advocates, and health experts. These insights were gathered through in-depth interviews conducted with the aforementioned stakeholders.

### Media Point of View

English newspapers journalists are more concerned with safer methods of use of nicotine compared to Urdu newspapers. They talk about it a lot more. It is discussed only a little by Urdu newspapers reporters. Urdu newspapers have fewer stories as compared to English newspapers. Apparently, safer nicotine does not appear to be a big thing to Urdu newspapers. The English and the Urdu newspapers largely isolate such stories within the paper, not on the first page. Therefore, it appears not to be such a big deal with newspapers in general. The vast majority of stories were an eyewitness testimony of such big cities as Islamabad, Rawalpindi, and Karachi. This reveals that urban dwellers are more concerned with it. The reporters of the Pakistani newspapers normally discuss safer nicotine in a negative manner. They discuss the medical issues it may provoke and are concerned with the addiction of people. However, it is said that some stories can make people stop smoking.

Experts claim that e-cig and heated tobacco are not totally safe according to Bloom berg. They are concerned that nicotine is damaging the brain and they do not know whether the products effectively make users quit smoking. During the 20th century, there were numerous individuals who succumbed to death due to smoking. It surpassed both world wars in death toll [36]. A lot of smokers were not aware of the harmfulness of smoking. It is essential, then, to seek solutions that would help minimize the damage caused by smoking without necessarily stopping people [37]. It has been found out that making cigarettes less addictive by decreasing the content of nicotine in them would benefit the general population health significantly [38]. However, not many people can give up smoking. This is also a problem of Pakistan. The resources available to assist individuals to quit smoking are not sufficient [39-40].

There are a few laws regarding smoking indoors in Pakistan, but they are not effective in assisting people to give up smoking. Nobody is aware of less harmful doses of nicotine as they are not heavily promoted. This demonstrates that we should have more effective ways of promoting better health by enabling people make healthy decisions.

### Country's context regarding THR and vaping

Media-wise, the reporting of THR and vaping in Pakistan appears to be skewed disproportionately to English daily newspapers, in particular, The News, The Express Tribune, and Dawn. These outlets have devoted significant space to the article, editorial, and news reports on safer options, which were mostly centered on e-cigarettes, ENDS, and HRPs. Interestingly, even with this broad coverage, the general feeling of such alternatives in the print media is usually skewed towards the negative. Much of the story focuses on the health dangers of vaping, questions of nicotine dependence, and the absence of regulation on these items. In contrast, Urdu dailies have less percentage of coverage, suggesting that they are less interested or occupy with discussing better alternatives of nicotine consumption which seems to be an urban problem, found in large cities such as Islamabad, Rawalpindi, and Karachi.

### **Trends observed reporting regarding the status of THR products in Pakistan**

There is a unique trend that can be identified throughout the coverage of THR products in Pakistan showing a heavy difference in the coverage of the English as compared to the Urdu newspapers. The News, The Express Tribune, and Dawn all in English dailies have a greater degree of interest and include more than three-fourths of the news bits concerning safer nicotine alternatives. The Urdu newspapers, on the other hand, play a minimal role in this discussion. Geographically, it is more focused on large urban centers, which implies a regional preference of urban locations where there are more vape outlets. It is quite important to note that although such coverage is massive, it is one-sided, focused mostly on creating a negative image about safer alternatives, highlighting about the health risks, regulatory issues, and the risk of becoming an addict. This creates a necessity towards a more balanced and all-round picture when it comes to media reporting particularly in Urdu dailies in order to develop a more knowledgeable populace on THR products and the potential implications of such products on the health of the people.

### **Media in portraying the THR landscape**

The media of Pakistan showcasing THR has an inclination towards the English dailies as compared to Urdu ones signifying a major emphasis of the topic in the English language dailies. Nevertheless, even when the issues are covered in various media in newspapers, the attention to this issue is obviously absent on front pages. Such a difference in coverage may have an impact on the perception and awareness of the masses particularly those that speak Urdu and who depend more on their respective dailies. Further, the news focus on the metropolitan cities, especially Islamabad and Karachi, reflects a restricted perception or the interest in alternative and safer locations outside the cities. Thus, to have a more accurate and comprehensive picture of THR in Pakistan, a wider regional and language coverage and more coverage on front pages are necessary. Moreover, the amount of coverage is rather high, but the overall tone also rather negative, with the major concerns being risks to health and regulators and the possibility of addiction due to nicotine. These negative depictions could be a setback to the general population to be informed about THR as a harm reduction approach. It, therefore, urgently requires the media to give an equal measure of the coverage by bringing out the possible advantages of such options in curbing combustible smoking and in helping smoking cessation. This may include presenting success stories, scientific findings that support the use of safer alternatives, and the good contribution that they can make to the fight against tobacco. This type of balanced reporting would help the population have a better-informed deliberation on THR in Pakistan.

### **Vape User Point of View**

Most of the users are in age category 25-35, which is an educated, employed, or student population. They are mostly of middle and higher-middle classes. Most of these vapers are located at the urban centers. Vapers are well educated education wise with a good percentage having attained higher secondary education. There are differences in employment among the vapers with 60% of them being employed and 40% students. The majority of vapers seem to be of middle to high middle-income generations. They are likely to live in well-off areas, with almost half of them reporting their place of residence as of upper middle class. In Pakistan, the situation seems to be that a significant percentage of the population is becoming direct adopters of vaping to directly change relatively smoldering smoking to the direct onset of vaping. Most of the respondents and other sources of information about vaping include friends who are the main introduction to vaping as well as the internet and social media. Interestingly, there appears to be an education level to the introduction to vaping phenomenon, where the less-educated population is more predisposed to visit vaping stores directly, whereas educated vapers tend to be introduced to vaping via their friends.

They have pointed out two primary barriers which included the cost of e-cigarettes and nicotine regulation. They find it hard to regulate the amount of nicotine of the e-cigarettes and are usually unaware that it contains a lot of nicotine causing them to have occasional headaches. Nevertheless, they report that they are happy taking e-cigarettes to places. The other issue that matters to vapers is a lack of vape shops, which are mostly located in certain spots of the cities. Therefore, they go to buy low-quality vape juices in convenience stores or petrol stations. In addition, they are worried about online vaping stores that are not controlled, and may sell local kits and juices at the cost of the brands Artisan Vapor, E-lite Cigs & Vaporizer, vape 360, Millennium Vapor, and Vape Essence. On the same note, they did not feel good about the repair charges and services of the expensive vape devices.

### **Vape shops Point of View**

Marketing THR products in Pakistan faces a number of serious challenges. Chief among such issues is the widespread ignorance and the existing misperceptions about the health effects of vaping. Lots of people in the nation still do not know or are not knowledgeable on the possible impacts of vaping to health hence a reluctance or opposition to embracing these harm reduction options. To make this problem even more important is the lack of knowledge about vaping and its dangers that are quite popular among the less educated citizens. The lack of knowledge enhances suspicion and hesitations to accept THR products as a good substitute to conventional ways of smoking.

Besides, social forces are central to the perception and behaviour in relation to vaping. The fact that friends are the main introducers of people to the process of vaping highlights the importance of social factors in adoption. This power may likely dominate the facts concerning the dangers and advantages of THR products resulting in the development of biased perception based on peer pressure instead of making a well-informed decision. In a nutshell, these obstacles, which include poor awareness, low level of understanding among the less educated population, and the effects of social groups, all hinder the large-scale adoption and consumption of THR products in Pakistan. To deal with these issues, the situation will have to be tackled in a complex manner that will include education campaigns, information dissemination, and actions to change the social perceptions directly related to the issue in order to make the population more educated and informed about the potential changes in their attitude to the THR options.

There are a few major things which have a complex influence on the acceptance, access, and pricing of THR products in the market that makes it a complex terrain when adopting these products. The level of education has a strong influence on the perception and decisions of people about THR products. Individuals with higher education tend to have a more subtle perception and preference to harm reduction options. On the other hand, lack of education is associated with a low level of awareness, which is why it has an impact on hesitation or lack of confidence in using these products.

The social circles have significant power on the acceptance and uptake of THR. The ubiquitous nature of friends as the main agents of introducing people to vaping highlights the efficacy of peer networks in creating perceptions. This societal pressure may override facts and their adoption may be more guided by the communities and their behaviours and not informed decisions.

Positive effects on perceived health when switching smoking to vaping have a significant effect on product acceptance. Users who claim to have improved health outcomes when they switch to vaping will help encourage and accommodate THR alternatives. Nevertheless, absence of clear knowledge regarding the health impacts of vaping is a critical challenge. Such ambiguity is a contributing factor to reluctance to use THR products by the potential users.

These causes and effects converge in the end to form an environment that is dynamic and affects the adoption of THR products. To increase acceptance and availability, it is appropriate to target

the overall education program, the specific information campaigns to dissolve the misconceptions and promote the informed decision making in the social networks in order to promote the more balanced perception of the potential benefits and harm related to THR alternatives.

Vaping drugs are comparatively costlier than conventional cigarettes. In Pakistan a pack of cigarettes that is paid the duty is above a dollar, and the vaping kit prices are between 28-170 dollars. This has been primarily due to the fact that the vaping products are imported and the kits are of China and flavors of the UK and Malaysia. Currently, it can purchase trendy locally produced ingredients and flavors at an extremely low price but of low quality too. Low socioeconomic smokers choose these kinds of e-cigarettes.

There were a number of challenges which the outlets encountered during the interview. The proprietors did not permit enumerators to visit vapers in their locations. Some believed that interviewers were the government tax authority, but others believed that it was the representatives of an average firm that intended to open a chain of vaping in Pakistan. It was even found that vapers were reluctant in most cases. It implies that vaping is an activity, which is not valued by the elders, parents, and other people of authority.

### **Tobacco Control and Public Health Point of View**

Very few of the officials in the field of public health wanted to have any conversations about THR and e-cigarettes in Pakistan and none of the representatives of tobacco control wanted to have any conversations. They claimed to ban e-cigarettes in Pakistan, as they are the followers of the FCTC (Framework Convention on Tobacco Control). One of them, who was speaking to us on the record, said, If we never protest against you, what will we do with our domestic spending?

Health professionals and activists of health advocate the necessity of the balanced approach to tobacco control and tobacco harm reduction. They underscore the fact that when tobacco harm reduction programs adhere to the sequence and experience gained in other harm reduction programs like those on HIV and drug use including behavior change interventions, they can be very effective. The urgent regulation of tobacco harm reduction products is considered essential so that they could be available to people changing to quit smoking cigarettes. The Pakistani government and tobacco control organizations have set rehabilitation facilities that incorporate tobacco harm reduction programs and past cessation drugs and substitutes. In Pakistan the use of e-cigarette is on the rise even in the open areas. Consequently, there is a need to control such tobacco harm reduction products. Moreover, it is being called to invite the public health experts in the tobacco harm reduction training and awareness sessions in the public and privately established universities.

Health professionals and activists of public health emphasize the need to have a balanced policy with regard to control and harm reduction of tobacco. They indicate that through integration of some of the lessons in other harm reduction efforts such as the HIV and drug related programs, the tobacco harm reduction initiatives can be more effective. There is a need to immediately control such products, so that accessibility could be made available to those who want to have alternatives to combustible cigarettes. The government and tobacco control agencies in Pakistan have instituted rehabilitation centers which incorporate tobacco harm reduction programs alongside the current cessation strategies and options. Due to the growing popularity of e-cigarettes as a harm reduction tobacco product in Pakistan, even in open areas, the regulation of these products becomes more pressing. Moreover, it is evident that there is an increased need to have the services of public health experts in the training and creation of awareness on the adverse effects of tobacco harm reduction, especially in higher educational institutions, both government and privately.

### **Mapping of Tobacco Harm Reduction in Pakistan**

THR products including e-cigarettes, heated Tobacco Products, Ambient nicotine products, and Smokeless tobacco present themselves as alternatives to traditional combustible cigarettes and tools for smoking cessation [41]. The Independent studies from global have identified lower toxicant levels and risk reduction tools, with varying nicotine delivery rates compared to conventional cigarettes [42]. Despite being recognized as tobacco products subject to WHO FCTC regulations, the addictive nature of nicotine remains a concern. While the public health and advocate of smoking cessation positions THR as part of harm reduction strategies and cessation aids. Recently, IQOS authorized in the United States [43].

### **Geographical Coverage of THR in Pakistan**

According to online data, more than 500 shops or larger outlets are operating in various cities of Pakistan, exclusively offering e-cigarettes, JUUL, and other THRs products via online purchasing. Fuel stations, cash and carry stores, grocery stores, and physical outlets are separate entities. This indicates that since 2018-19, only 100 to 150 outlets were available, but now there has been an increase of more than 200% in outlets, coinciding with a rise in the number of THR users over time. Users continue to face challenges with obtaining refills and e-cigarette juices conveniently delivered to their doorstep. Due to the unavailability of these products when needed, they sometimes revert to using combustible cigarettes, especially during gatherings, parties, and corner meetings.

### **THR Products: Use and Regulation in Pakistan**

THR products, although unofficially accessible in Pakistan and currently not under any restrictions or bans, are undergoing a proposition for regulation and legalization by the Ministry of National Health Services Regulations and Coordination through a Statutory Regulatory Order. This initiative, approved by the federal cabinet in December of the preceding year [44]. The outlets are mostly located in urban cities, but the users of these products belong to both urban and rural areas. Three years ago, these products were only used in urban and wealthy socioeconomic areas, but now they are used and available in other urban and city areas. Over time, the number of users of these THR products increased.

### **Current Status of THR Products in Pakistan**

In major urban centres such as Karachi, Hyderabad, Lahore, and Islamabad, there is a prevalent trend of vaping predominantly among the younger demographic. This trend of vaping is especially high in these cities, which indicates that the use of this activity in the young population is becoming widespread among them. Education is one of the factors that are seen to have contributed to this trend of vaping with a large percentage of vapers having gone through higher secondary or in tertiary education. This teaching education is a correlation to vaping which implies that it can be correlated with awareness, openness to new trends, or a more thoughtful attitude to harm reduction options.

In addition, the middle-to-middle-high-income backgrounds are the primary origin of the demographics of vapers. The given socioeconomic profile demonstrates that the most vaping along with urban areas tends to be embraced by people with rather stable or rather prosperous origins. There are also some trends that can be indicated by the spatial distribution of vaping products which are highly concentrated in rich localities. This fact points out to the possibility of the existence of a correlation between the availability of vaping products and buying power or demand in richer regions, and hence a market orientation that is oriented on serving these particular groups.

On the whole, the vaping trend among Karachi, Hyderabad, Lahore, and Islamabad delineates a demographic trend that is mostly characterized by young people with a higher level of education

and middle-to-higher-middle-class origins. The location-based concentration of vaping substances in wealthy areas also supports the location-based marketing of the products in the urban centres.

### **Demographics and Socio-economic Backgrounds of Users**

Most of the users are between the ages of 25-35, who are educated, employed or students. They are mostly of middle and higher-middle classes origin.

### **Evolution of Social Acceptability of THR Products**

Vaping is deemed as an acceptable social activity among young and educated populations who tend to believe in the idea that vaping is cool. Media representation and social group reinforcement is very instrumental in this perception. The media, such as the social media, entertainment and others, depict vaping as cool, up to date and in line with a cool lifestyle. Such a depiction brings a favorable image of vaping which will attract the more educated and younger generation of the population. The social acceptability of vaping is also contributed to by the way it is presented in different media outlets as a trendy, and highly-style habit. In addition to this, in the social circles, peer pressure is a decisive factor. The social desirability of vaping by the friends and acquaintances further consolidates its use by this group of individuals. Social nature of vaping as a joint activity or a means of bonding with other individuals increases its appeal in such groups. Combined with the effect of media display and having friends who also vape, this creates an image in the minds of young, well-educated people that vaping is a part of the modern trends and social standards. Such a connection of vaping to being cool or trendy is one of the reasons why it is socially acceptable among this group. It is however important to add that this positive image may dwarf factual facts about health risks, which may have an effect on the decision-making process among such individuals. There should be attempts to balance information dissemination and awareness to reduce the possible misconceptions and informed decision-making when it comes to vaping.

### **Contribution of THR to Tobacco Control in Pakistan**

Vapers who used to smoke often mention that they improve their health condition. Numerous vapers report that their well-being has improved since making such a transition and that they can attribute this to the fact that they are less exposed to dangerous substances contained in conventional cigarettes. This perceived betterment is usually a pushing force that makes people choose vaping as a harm reduction measure. Although the perceived health benefits exist, an overriding challenge comes out as a result of the lack of comprehensive knowledge among vapers on the possibility of the health risks associated with vaping. Although the users can note the improvement in personal health, ambiguity or the lack of full awareness regarding the overall health effects of vaping can be observed. This ambiguity in regard to the long-term consequences or even in regard to certain health risk is a big obstacle, and it may prevent users to make a fully informed decision about their vaping behaviors.

Education campaigns and spreading of correct information should be undertaken as an effort to fill this gap in knowledge. It is of critical importance to provide a subtle insight into the probable benefits as well as the risks vaping poses to vapers in order to empower them make an informed choice on whether to use harm reduction options or not.

### **Integration of THR into Public Health Discussions and Human Rights in Pakistan**

A collective demand has been expressed by the vapers of Pakistan who wanted to have regulatory measures similar to the one that was taken on the traditional tobacco products. This regulation demand highlights the recognition of the important role of vaping among users as a health problem of significant concern to the general population. The identification of the possible effect of vaping on the population health leads to the necessity of the systemic instructions and regulations of its

usage and distribution. The fact that there is a vacuum in regulation of vaping in Pakistan is one of the reasons behind this call to regulate it. Lack of proper and detailed laws that govern vaping products in particular has created a form of confusion and variations in the way they are used, distributed, and marketed. This regulatory gap has resulted in a difficult situation where the standards are not clearly identified, and this may create a safety and health risk to consumers.

The regulation request by the vapers also reveals their realization of the need to have an orderly set up on the making, sale, and use of vaping products. With the call to produce regulations that seem similar to the traditional tobacco products, vapers show the necessity to address possible health risks of vaping, product safety, and the protection of the interests of the population. The adoption of proper regulations in line with the characteristic of vaping products would not only solve the existing gaps in the regulation but also create a regulatory framework that would ensure quality of the products, limit access by minors and give the required health warnings. These laws would not just provide the protection to the users, but they would also help to prevent any possible negative health outcomes as well as reinforce the responsible use among the population.

### **Discussions**

This study used mixed method approach to determine the mapping of THR in Pakistan for smoking cessation use different stakeholder point of views regarding the barriers and challenges for THR, scope of THR, health short and long-term adverse effects, and THR status. To understand the media point of views about THR in Pakistan, conducted in-depth open-ended interviews with different newspapers reports including English and Urdu.

English dailies reporters in Pakistan give considerable coverage to safer nicotine alternatives but often with a negative bias. Urdu dailies reporter contributes less coverage, especially outside major urban areas. English newspapers focus more on THR but lack front-page coverage.

According to findings from media reports, discussions about THR or safer nicotine products predominantly occur in English newspapers rather than in Urdu ones. Urdu is the national language of Pakistan and serves as the lingua franca of the country. While only approximately 7% of Pakistanis speak Urdu as their first language, it is widely spoken and understood as a second language by the vast majority of the population [45-46]. Native Urdu speakers are dispersed throughout South Asia, including India, Bangladesh, Nepal, Pakistan, and Bhutan [47]. The news, articles, and letters to editors advocating for THR are supported by a few NGOs, community-based organizations, and individuals who have been receiving funding from Bloomberg for a considerable period to combat or regulate tobacco use.

However, despite these efforts, combustible tobacco use in Pakistan has been on the rise over the years, with a quit rate of less than 3%. The economic burden of tobacco has also increased over time, with revenue from tobacco equating to almost 20% of the economic burden associated with tobacco use [48-49]. These efforts clearly indicate the initiatives and significance taken in Pakistan regarding tobacco control. There is a need to educate English as well as Urdu newspaper reports to understanding about THR products and their efficacy in the reduction of combustible cigarettes and health benefits. Further these efforts will be translated into the reduction of economic burden and save the millions live. There is a strong need for Urdu-translated material on THR research, empirical evidences, and adverse effects from well-reputed researcher/institutions, rather than relying on NGOs.

The number of people aged between 25-35 years in Pakistan is high, and they use combustible smoking and THR products [50]. Three major types of THR are common among the combustible smokers in the country; e-cigarettes, JUUL and smokeless tobacco. Its major issues include high cost of e-cigarettes, the regulatory barriers and easy availability of the refills at the door step. The benefits of e-cigarettes and JUUL are highlighted by many and issues about the quality are also brought up by many, especially with respect to disposable e-cigarettes and dosage of nicotine.

They do not have a clear understanding regarding e-cigs and JUUL. They consume these products depending on their personal knowledge and based on the knowledge they obtain in the sources of friends, vape stores, and the internet. The provision of smoking cessation services is virtually absent in Pakistan and adult smokers do not have any support in quitting smoking. The number of calls placed to the national quit line between 2015 and 2020 only amounted to 2300, and only 70 cases of successful quit were reported [51]. Smokers that show interest in safer substitutes do not get any medical advices; his or her friends present most of them with alternatives. Although adult smokers in Pakistan are willing to quit and understand the health risks of smoking, they tend to feel alone in their attempt to quit and are easily influenced by peer pressure. Though such products are accessible in the legal environment, their accessibility is one of the major constraints, and only one out of 10 smokers is ready to spend more than PKR 4000 per month [52].

There is little knowledge by the public health practitioners on nicotine with 70% of doctors having the opinion that it leads to cancer. The majority of doctors have not been trained in smoking cessation and nicotine awareness which represents a shortcoming in providing healthcare support to the smokers [52]. The owners of the Vape shops demonstrates that attitudes and behaviors concerning vaping are greatly influenced by social factors, and friends are usually the major figures in initiating people into the world of vaping. Social forces might take precedence over factual data regarding the risks and merits of THR products, which results in prejudiced knowledge affected by peer pressure. These tendencies are consistent with the conclusions of other global researches [53-55].

Some of the issues that limit the acceptance of THR products in Pakistan are; lack of awareness, knowledge among the less educated population, and the social group. These issues should be tackled by complex strategies like educational programs, dissemination of information targeting, and measures that would help to revise the societal attitudes. The education levels have a great influence on the perception and preferences of individuals in relation to THR products; higher education is associated with the tendency to use the harm reduction alternatives [56]. In THR acceptance, social circles are also important and friends' impact more on the perceptions and behaviors than factual information [57]. The perceived effects of health improvement after quitting smoking in favor of vaping influences product acceptance, but uncertainty regarding the health effects of vaping is a barrier. This should be in the form of elaborate education programs and specific information propaganda to create a more enlightened perception of THR alternatives. In the UK, US, and Austria, e-cigarettes remain the center of social, media, and governmental interest.

Also, the evidence-based research on the topic exists [58] and there exists a necessity to meet the demand of the vapers on regulations and the necessity to create a systematic order in regulating the production, sale, and usage of vaping products. Promotion of moderate policies and participation of state health professionals in THR training and awareness intervention [59]. Discusses the perceived increase in health among users but reports incomplete knowledge of the health risks of vaping.

### **Conclusions and recommendations**

Although safer nicotine alternatives are widely covered by English dailies in Pakistan, most reports are negatively skewed. Conversely, Urdu dailies give the topic limited coverage except for English cases in major urban centres, with THR getting minimal mention by English papers due to other front-page issues. Observations from media show that THR conversations are a preserve for English newspapers, although Urdu is the national language and also spoken as a second language widely. THR advocacy in Pakistan is funded by Bloomberg through some NGOs, CBOs, and individuals despite a quit rate of less than 3% and a high prevalence of combustible tobacco use. The strategic intervention for Pakistan to reduce tobacco use highlights education programs for English and Urdu newspaper reporters. The informal content should educate THR products'

efficacy in level reducing combustible cigarette use and health benefits. Consequently, the financial burden of tobacco use could be relieved, and thousands of lives could be saved. The informal materials translated into Urdu on the research of THR, its empirical pros, negative testimonies, and more, should be presented by verified personnel and institutions. It would also boost their distribution and comprehend nature of existing information and lessen the necessity on the remaining NGOs.

In Pakistan, a large proportion of the population aged 25 to 35 use combustible smoking over THR products such as e-cigarettes, JUUL, and smokeless tobacco. High e-cigarette pricing, regulatory difficulties, and restricted refill availability are among the challenges. Despite being aware of the health concerns, adult smokers in Pakistan have little help for quitting, with cessation facilities almost non-existent. Social forces strongly affect perceptions about vaping, frequently overshadowing factual facts regarding THR products. In Pakistan, barriers to THR acceptability include a lack of awareness, poor information among the less educated population, and societal factors. Addressing these difficulties requires multifaceted methods that include educational efforts and modifying social views.

To develop a better knowledge of THR alternatives, efforts should be directed towards broad education initiatives and targeted information campaigns. Regulatory frameworks controlling the manufacture, sale, and use of vaping goods must be implemented, considering vapers' requests for restrictions and integrating public health professionals in training and awareness programmes.

#### **Data Availability**

All relevant data is presented in the manuscript. The complete data set can be obtained from the corresponding author upon request.

#### **Conflicts of Interest**

There are no competing interests from the authors or the Global Action to End Smoking.

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