RESEARCH ARTICLE

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Qualitative Analysis of Opinions and Beliefs Associated with the Use of Tobacco Dentifrice among Individuals Attending a Tobacco Counselling Session

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Abstract

Background: Smokeless tobacco (SLT) use is positively associated with oral, oesophageal, and pancreatic cancers. The tobacco dentifrice is a type of SLT which is applied to the teeth and gums. It is available in different forms which include mishri, gul/gulmanjan, gudhaku, snuff, red tooth powder, and creamy snuff. This qualitative study aims to explore the opinions and beliefs associated with the harmful effects of tobacco dentifrice use. **Methodology:** Thirty in-depth interviews were conducted among tobacco dentifrice users visiting a dental hospital. The data were coded and analysed using thematic analysis in ATLAS.ti software 8. **Results:** A total of 11 codes and six categories were generated which comprised of the reason for the initiation, awareness of health effects, perception of oral tobacco application, perception of quitting, the reason for continued use, and use in society. Family, peers, access to the product, curiosity were important factors to initiate the tobacco dentifrice use. Participants believed in the myth that tobacco dentifrice was beneficial for the teeth, gums, and bowel movements. The participants considered tobacco dentifrice to be less harmful than other forms of tobacco. However, some participants were aware of its adverse effects on health and have tried to quit in the past. None of the participants had taken any professional help for quitting. **Conclusion:** There were strong beliefs and myths among the participants that tobacco dentifrice was beneficial for oral and general health. There is a need to create awareness and improve the standard of the health warning of such products.

Keywords: Dentifrice- Gul Manjan- India- Red Toothpaste- Red Toothpowdwer- smokeless tobacco- Tobacco use

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Introduction

The oral application of tobacco or tobacco dentifrice is a type of smokeless tobacco (SLT) commonly used in India and Bangladesh (WHO FCTC NICPR factsheet, 2017). It is available in powder and paste forms and applied most commonly with index finger on teeth and gums (Bhonsle et al., 1992). The different forms of tobacco dentrifice includes mishri (roasted and powdered tobacco), gul/gulmanjan (pyrolyzed tobacco product), dry snuff, gudakhu (paste of tobacco and molasses creamy), and red tooth powder (laldantmanjan) which is applied on the teeth and gums as a dentifrice (National Cancer Institute and Centers for Disease Control and Prevention. Smokeless Tobacco and Public Health: A Global Perspective, 2014; Gupta et al., 2016). According to the Global Adult Tobacco Survey-2 (GATS-2), 266.8 million adults in India, aged 15 and above currently use tobacco in some or other form, and oral application of tobacco was used by 3.8%, more commonly used by women (4.3%) compared to men (3.3%) (Global Adult Tobacco Survey, 2016-17).

Sinha et al. (2004) reported that the use of tobacco products as dentifrice range from 6% (Goa) to 68% (Bihar) in India, and the tobacco toothpaste and red tooth powder were reported to be used in 14 states of India. Gulmanjan/gul were used in eight states of India whereas the other products such as mishri and dry snuff were used in Goa and Maharashtra; gudakhu in Bihar,Orissa, Uttar Pradesh, and Uttaranchal; and tobacco water (tuibur or hidakphu) made by passing tobacco smoke through water in Manipur, Mizoram, Sikkim, and Tripura (Sinha et al., 2004; Gupta et al., 2016)

Gulmanjan and mishri contains polycyclic aromatic hydrocarbons including the carcinogen benzo[a]pyrene, and toxic and carcinogenic elements such as arsenic, cadmium and polonium-210 have also been found in these types of SLT products (Smokeless Tobacco and Public Health: A Global Perspective, 2014). Tobacco based dentifrices are used more by females compared to males and are also popular among children (Aggarwal

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and Ray, 2012).

Nair et al., (2015) reported the use of mishri and gulmanjan by the women aged 18–40 years in a Mumbai slum community. Kumari and Nath (2008) reported gulmanjan use among the undergraduate male medical students of Lucknow, India.

The manufacture and sale of all cosmetics and all Ayurvedic drugs licensed as toothpowders/toothpastes containing tobacco have been prohibited by the amendment in Drugs & Cosmetics Act, 1940 vide notification published in the Gazette of India vide G.S.R. 443(E) and 444(E) dated 30.04.1992. However, studies have reported nicotine content in some of the toothpowders (Aggarwal and Rajagopal, 2009). Tobacco use is not restricted to individual's behaviour but is a multifaceted process contributed by a varied range of factors such as social, environmental and psychological which are linked to the tobacco use (Fryer et al., 2017).

Even though tobacco-based dentifrices have been banned; there is widespread availability of such products in the domestic markets. There is a need to explore the reasons behind the continued use of these dentifrices in spite of the well-known side effects. Hence this study was conceptualized to explore the tobacco dentifrice users' opinions and beliefs on the harmful effects of its use.

Materials and Methods

Study design

A qualitative study based on constructivist grounded theory methodology underpinned the research questions, study design, data collection, analysis and interpretation (Charmaz, 2006).

Study Setting

In-depth face to face interview was conducted among the participants attending the tobacco cessation clinic, at Centre for Dental Education and Research (CDER), All India Institute of Medical Sciences (AIIMS), New Delhi. This study was conducted in the tobacco cessation clinic in a closed space without any noise disturbance. Any patient identified of tobacco consumption are referred to the tobacco cessation clinic of Public Health Dentistry from the centre. The clinic is located in the general dental OPD on dental chair numbers 11 and 12 rum by Public Health Dentists. The walls of the tobacco cessation clinic have Behaviour Change Counselling materials tailormade for tobacco counselling. Also it has flipcharts and booklets for educating patients and models and charts for mass health promotion on tobacco cessation. There are OPD cards especially for tobacco intervention for the patients.

Selection criteria

Individuals above 18 years with history of current tobacco dentifrice usage were included. Individuals who had quit the habit and those not willing to provide written informed consent or to record their voice responses were excluded from the study. The participants were recruited until data saturation (Silverman, 2004) was reached and no meaning full data was obtained.

Procedure

The interviews were conducted for two months from February to December 2021 at the tobacco counselling clinic of CDER. Three trained Masters in Dental Surgery (MDS) interviewers (Ravi P, Agarwal D & Bhadauria US) conducted the interviews in the Hindi language. Ravi P (female), Agarwal D (female) & Bhadauria US (male) were senior residents in the Department of Public Health Dentistry at the time of the study. An interview guide was developed to explore a variety of factors to assist in identifying the opinion and beliefs on the harmful effects of tobacco dentifrice use. The discussions were not restricted to the interview guide and were aimed to extract maximum information from the participants. The participants spoke freely about their beliefs and opinions that they considered important with respect to their tobacco dentifrice use. The interview was conducted for duration of 20-30 minutes. The interview was recorded using a Dictaphone (Sony ICD-PX470 4GB Digital Voice Recorder),this device had a high sensitivity microphone to record the voice, 4 GB storage and in-build USB to easily transfer the data to computer.

The interview guide was developed by the project team based on the research objectives. The guide comprised of the reason for the initiation, use among the family members and peers, first experience and influencers, the reason for continuing, ill effects of tobacco dentifrice use, perception on tobacco dentifrice, knowledge about the health warning on the pack, and quit attempts.

Ethical Considerations

To minimize literacy concerns the Participant Information Sheets (PIS) and Informed Consent (IC) were read aloud to all the participants. A signature/ thumb impression was obtained from literate and illiterate respondents on the informed consent form. This study was cleared by the Institutional Ethics Committee of the All India Institute of Medical Sciences (AIIMS), New Delhi (IEC-901/30.01.2020, RP-02/2020).Tobacco cessation counselling was provided to all the participants after the interview.

Data analysis

Two investigators (Ravi P & Agarwal D) transcribed the audio recording verbatim to Hindi and translated to the English language. A third investigator (Purohit B) back-translated the transcripts independently for validation; any discrepancies were resolved through discussion. Data coding was conducted following principles of thematic analysis as suggested by (Braun and Clark, 2006). Qualitative data was coded and analyzed using ATLAS. ti 8 software (Atlas ti, 2020). Two investigators (Ravi P & Agarwal D)coded all the interviews independently and generated preliminary codes using deductive and inductive coding methods. Similar codes were then compared and contrasted to create categories. Codes were compared and consensus for coding was reached. The relevant and representative quotes were extracted for each category.

The RATS guidelines modified for BioMed Central to peer review a qualitative study was used (Clark, 2003).

Results

A total of 30 participants were recruited in this study until data saturation was reached. Twenty five males and five female tobacco dentirifice users participated in the study. The reason for more male participants in the present study is due to the fact that more male patients visit the institutional health set up for seeking dental care. Most of the participants used smoking or smokeless tobacco products along with tobacco dentifrice; however, one participant exclusively used tobacco dentifrice. The frequency of use was once to four times a day and duration of use ranged from 6 months to 40 years. "Gul", "Gulmanjan", "quit", "photo", "craving", "kids", "experience", "cancer" were the commonly used words by the participants (Figure 1).

Eleven codes and six categories were developed (Table 1). The codes generated were family influence, peer influence, social influence, self-interest, awareness on ill effects, effect of health warning, first experience, reason for not quitting, and perception on tobacco dentifrice, quit attempt.

The opinions of the participants under 6 categories have been explained below

1. Reason for initiation of use

The study participants attributed their influencers for tobacco dentifrices were from their family, peers or self-interest of the individual. The relationship between the various influencers under different codes has been explained using the social network analysis (Figure 2).

Family Influence

Parents and elder siblings were the common influencers in the family. 'Easy access' to the tobacco dentifrice use at home was also an important reason to start oral tobacco application. They were offered as pain relief for tooth ache, and to clean the teeth by their family members. Some of the opinions expressed by individuals have been listed below:

"It is always kept at home. Many people in my family used it, so I started to use it. I started for my tooth ache, I used to get pain relief." (25 years old male, 10 years of tobacco dentifrice use)

"My elder brother offered me the first time to use. He suggested brushing the teeth with tobacco powder." (49 years old male, 6 months of tobacco dentifrice use)

"My parents were using it. So, I also started to use. First time my father was using it and he offered me too." (39 years old male, 6 months of tobacco dentifrice use)

Peer influence:

Friends and colleagues have been reported to influence the individuals towards tobacco dentifrice use.

"Friends told me to use it, they also used gul. After that I started using it daily." (24 years old male, 5 years of tobacco dentifrice use)

"While working my colleague was using it. They told it is good for teeth, it reduces tooth ache. So I also started using it." (48 years old male, 25 years of tobacco dentifrice use)

Self-interest:

'Curiosity' to try a new tobacco product, 'accessibility' in the grocery stores, and using other smokeless tobacco products like gutka and khaini were the factors to initiate the tobacco dentifrice use with self-interest. The participants who have started tobacco dentifrice use with self-interest have influenced other family members.

"I took based on my wish, as I was also eating gutka and other products" (25 years old male, 3 years of tobacco dentifrice use)

"I got it from the shop myself, near my house" (50 years old male, 7 months of tobacco dentifrice use)

"It is always available in the shops. I started using it little by little. Wanted to see what type of tooth powder it

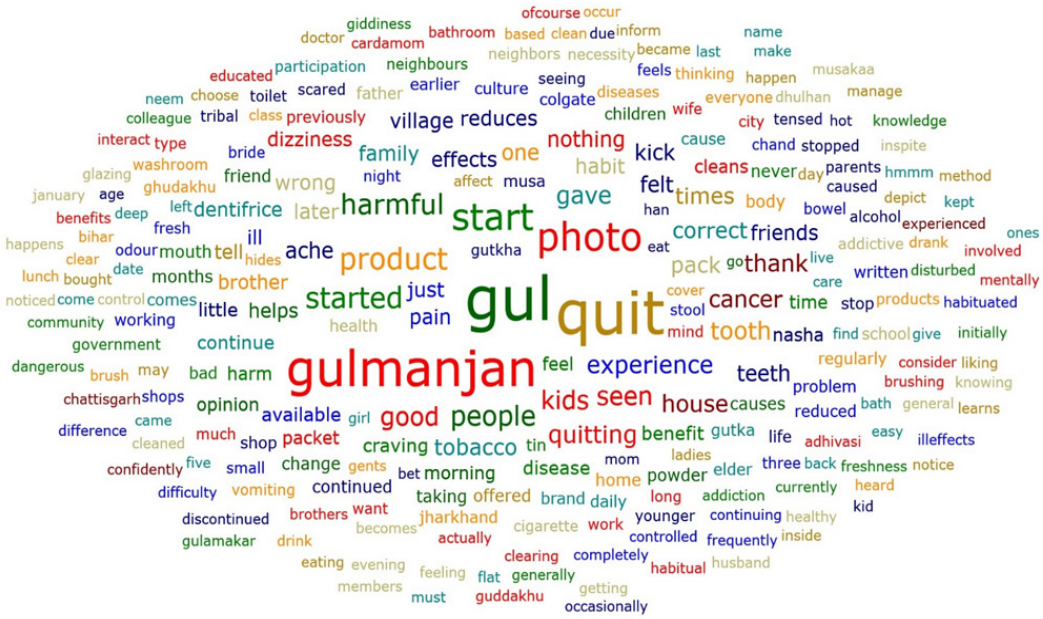

Figure 1. Word Cloud Analysis

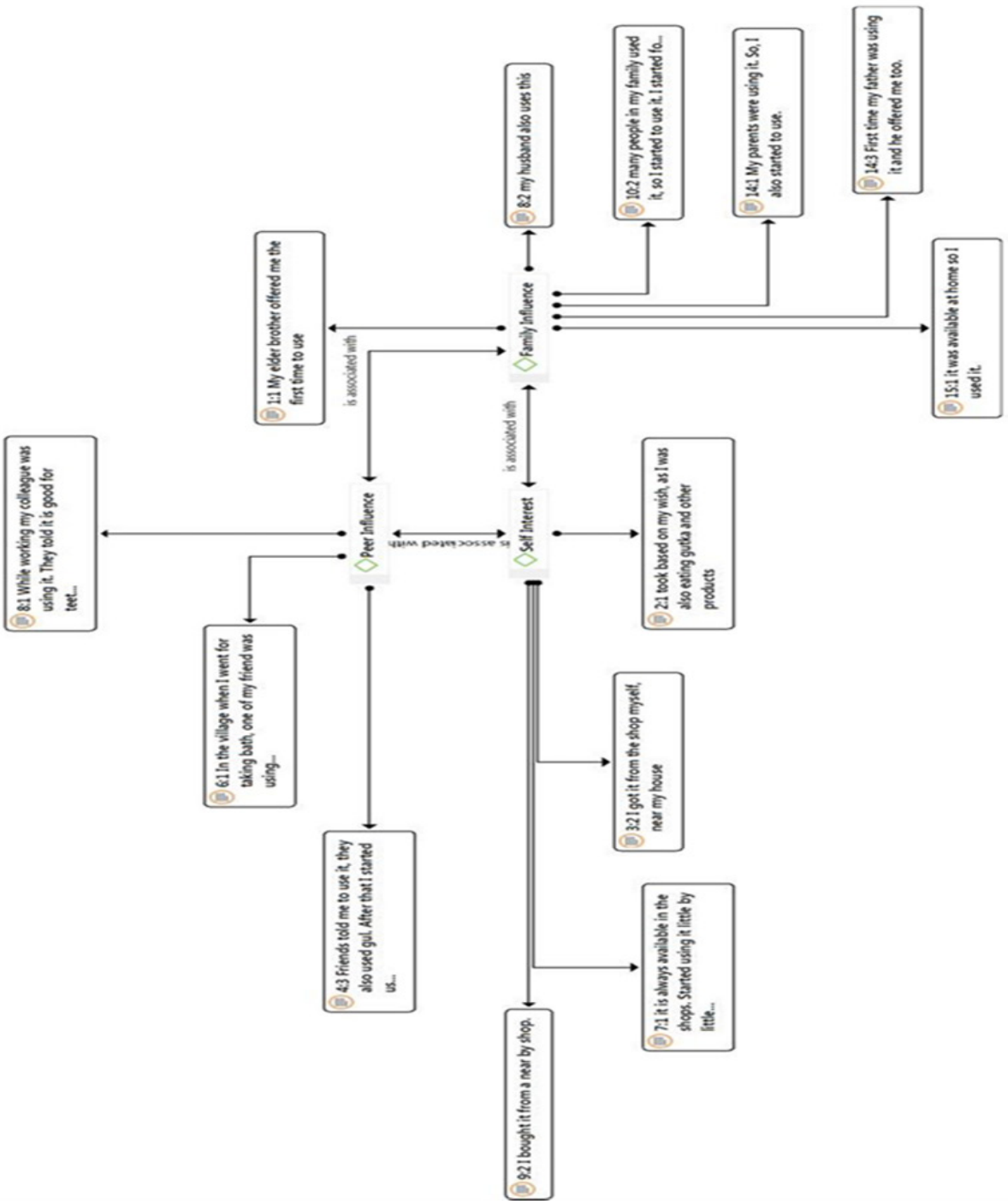

Figure 2. Influencers for Tobacco Dentifrice Use

is. My wife and sister also use it now." (50 years old male, 12 years of tobacco dentifrice use)

Awareness

Awareness of health effects

Only few participants were aware of the harmful effects of the tobacco dentifrice use.A participant showed ignorance towards the health effects, he also reported that he did not have deep knowledge about tobacco dentifrice associated health effects. However, he was aware of the health effects of smoking, smokeless tobacco, and alcohol. Tobacco dentifrice was considered to be less harmful compared to other tobacco products among the study participants.

"I am an educated person; I can understand tobacco is harmful for health. When I'm mentally disturbed then I do this wrong habit. But, it is harmful. It is not good for my health, so I'm always tensed because of this." (49 years old male, 6 months of tobacco dentifrice use)

"I have heard that chewing tobacco, cigarette and alcohol can harm the body. I don't have deep knowledge about the harmful effects of Gul." (24 years old male, 5 years of tobacco dentifrice use)

"It causes addiction, but it feels good to use it. Later in life it is harmful and can cause diseases in our body." (32 years old male, 10 years of tobacco dentifrice use)

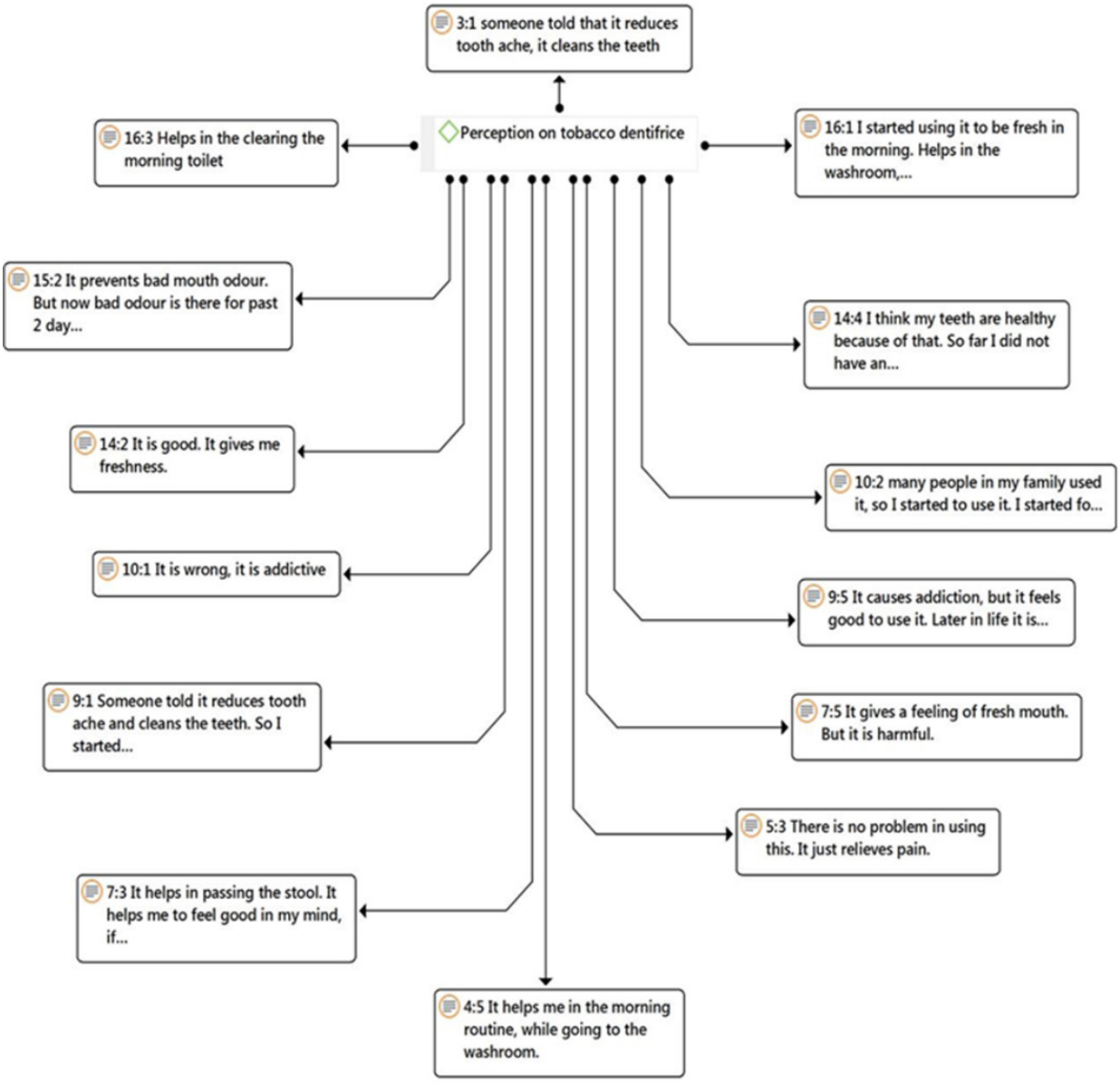

Figure 3. Perception on Tobacco Dentifrice Use

"I don't know the health effects. There might be something. But, I have not experienced anything so far." (42 years old male, 20 years of tobacco dentifrice use)

None of the participants were aware of the organ specific adverse effects oftobacco dentifrice. Although, they reported that it could be harmful and cause addiction.

Effect of health warning:

Only few participants were able to recollect the pictorial warning on the pack.

"Cancer photo is there only on gutka. In Gul I have not seen any photo." (25 years old male, 3 years of tobacco dentifrice use)

"I have seen the photo on the pack, that's why I'm scared now. I get tensed at night. I have come from so far for this treatment only." (49 years old male, 6 months of tobacco dentifrice use)

"It just says that it's good for the teeth. There is no photo, but it says it is harmful." (50 years old male, 7 months of tobacco dentifrice use)

One participant could only remember the brand photo and had not noticed the health warning.

"I have seen the cover; it has a photo of a bride. I don't remember seeing anything else." (48 years old male, 25 years of tobacco dentifrice use)

Table 1. Codes and Categories

S.no.	Codes	Categories
1.	Family influence	Reason for initiation of use
2.	Peer influence	
3.	Self-interest	
4.	Awareness on ill effects	Awareness of health effects
5.	Effect of health warning	
6.	Tobacco dentifrice used	Perceptions on tobacco dentifrice use
7.	Perception on tobacco dentifrice	
8.	Quit attempt	Perceptions on quitting
9.	First experience	Reasons for continuous use
10.	Reason for not quitting	
11.	Use in the society	Use in the society

"It was written as Musa Gul and below it was written that it is harmful. I don't remember seeing any photos." (32 years old male, 10 years of tobacco dentifrice use)

Perceptions on tobacco dentifrice use

The participants reported the myths of using the tobacco dentifrice use to clean the teeth and feel fresh in the morning, used as a mouth freshener, to help in bowel movements and to pass the stool, and to get relief from tooth ache. Most of them reported it as their morning routine to use the tobacco-based dentifrices (Figure 3).

"It helps in passing the stool. It helps me to feel good in my mind, if I have gul in my mouth in the morning, then bowel is getting cleaned and it is easy to pass the stool. But actually it causes diseases and harmful." (50 years old male, 12 years of tobacco dentifrice use)

"I started using it for my tooth ache, I used to get pain relief. I think my teeth are healthy because of that. So far I did not have any problem using it." (39 years old male, 6 months of tobacco dentifrice use)

A participant was using tobacco dentifrice to prevent oral malodour, however he expressed that it was not useful and his visit to the dental hospital was for the treatment oral malodour.

"It prevents bad mouth odour. But now bad odour is there for past 2 days, I can feel it myself." (36 years old male, 3 years of tobacco dentifrice use)

Perception on Quitting

Quitting attempt

Most of the participants had tried to quit the use; however, they had difficulty in overcoming the addiction associated with its use. Shifting from one form of tobacco dentifrice use (gul) to the other (gudakhu) was reported by a participant. Unavailability of the product was reported as a facilitator to quit the tobacco dentifrice use.

"I have tried to quit. Just like that I make my mind and stop for 4 days and then I have craving to use it again. Frequently I start thinking about it, then I start again." (39 years old male, 6 months of tobacco dentifrice use)

Negative perception towards quitting was reported by a participant.

"Even those who eat cardamom get cancer. Those who drink day and night alcohol do not get anything. My friend never ate anything got mouth cancer. Those who have to get the disease will get it anyways." (24 years old male, 5 years of tobacco dentifrice use)

Two participants reported family members as the influencers for quitting. Craving after quitting had not been properly addressed, therefore, the participants had relapse. One participant had followed the coping techniques like drinking water to overcome craving. However, none of them took professional help from a doctor or tobacco counsellor.

"I tried many times. Once I even promised my father that I wouldn't take again, 10 days I did not use it. Later I started again." (62 years old male, 40 years of tobacco dentifrice use)

"I tried because my mom told me not to use it. My brother also bet me twice for using this. But I don't feel good after quitting it. I had craving after quitting. I drank water when I had craving." (62 years old female, 3 years of tobacco dentifrice use)

"I have tried to quit. Just like that I make my mind and stop for 4 days and then I have craving to use it again. Frequently I start thinking about it, then I start again." (39 years old male, 6 months of tobacco dentifrice use)

One participant reported quitting gutka, but had never attempted to quit oral tobacco application.

"I try to quit gutkha. But Gul I use daily. It has become a habit." (36 years old male, 3 years of tobacco dentifrice use)

Reasons for continuous use

First Experience

Most of the participants referred to nasha (Hindi) or intoxication as first experience followed bydizziness, nausea, vomiting,and kick. The participants also explained the reason for continuous use.

"I felt dizziness, and vomiting. Slowly vomiting reduced, so I started using regularly.It was addictive and gave me kick." (24 years old male, 5 years of tobacco dentifrice use)

"I felt dizziness but pain was reduced. So I continued to use it" (62 years old male, 40 years of tobacco dentifrice use)

Reason for not quitting:

It is reported to be addictive, and an accepted morning practice, therefore making it difficult to discontinue its use among participants. As few participants were not aware of the health effects, they had never thought of quitting.

"It helps me in the morning routine, while going to the washroom." (24 years old male, 5 years of tobacco dentifrice use)

"I never had opportunity to think about quitting. If required I will quit." (50 years old male, 12 years of tobacco dentifrice use)

Use in the society

Most of the participants reported the use of tobacco dentifrice in their neighborhood. Children in these households are exposed to these tobacco products and reported using the same.

"Small kids also use it. Ladies and gents use it in the community in which I reside. It is a tribal culture so children also use." (49 years old male, 6 months of tobacco dentifrice use)

"I have not seen anyone use in the city. I'm working here for 7 months. I don't use here." (62 years old male, 40 years of tobacco dentifrice use)

"See, in Bihar most of them use it. If parents are using in the house, then the kid sees and he also learns to use it.Kids might be using, because it is easily available in all the shops."

Discussion

This study focuses on the several important findings with implications for research and policy on the opinions, beliefs, and myths associated with the use of tobacco dentifrice. To the best of our knowledge this is the first study to document exclusively the opinions and beliefs

about the use of tobacco dentifrice. In the present study, participants were unaware about the ill effects of tobacco dentifrice and considered it a medical alternative to relieve dental and certain systemic diseases. Tobacco dentrifice was considered to be less harmful compared to smoking and other smokeless tobacco products. This implies that tobacco dentifrices are considered similar to or better than the regular dentifrice among our study participants. The reason could be due to its cultural influences, easy availability in the stores along the regular groceries, and affordability due to its low cost. Therefore, there is a need for restricting its sales and marketing along with the household groceries.

A significant positive association of SLT use with oral and oesophageal cancers was reported in the South-East Asian Region (SEAR) and Eastern Mediterranean Region (EMR), and pancreatic cancer in the European Region (EUR) (Gupta et al., 2018) In the present study, participants considered tobacco dentifrice to relieve toothache, help in bowel movements, for fresh breath, and as a mouth freshener. These findings were in line with the findings of Dongre et al. (2008) reporting the reasons for tobacco use among the adolescent boys which included felt better, to ease abdominal complaints and for dental problem.

Most of our study participants used tobacco dentrifice in the morning, which is in line with study conducted by Nair et al., (2015) in which gul users chewed or rubbed tobacco within the first 30 minutes of awakening. Participants who had the self-interest to initiate the use of tobacco dentifrice were previously using some other form of tobacco. This could influence the uptake of tobacco dentifrice. The users could be unaware of the tobacco content in these products as reported in our study where one of the participants exclusively used tobacco dentifrice.

The current study reports that the influence of family, and peers, of the individual plays a major role in the initiation of tobacco dentifrice use. Similar results were reported by Goyal et al., (2020); Ullah et al., (2018); and Haque et al., (2019) in which parents and peers played a vital role in influencing the tobacco use. In addition, self-interest, and availability of the product were reported to be the key influencers in starting the tobacco dentifrice use. The study participants reported that tobacco dentifrice use was an accepted practice in some of the households and possesses the risk for its use among children. Tooth powder/paste was shared in the family, children get used to its taste and are more likely to get addicted to tobacco, as they grow older (Kumar et al., 2011) The use of tobacco dentifrice by children in the community were reported in the current study and was consistent in line with the study by Goyal et al., (2020) conducted among the parents and children of Northeast part of Uttar Pradesh, India, where Rani manjan or Gulmanjan was the most commonly used tobacco product to clean their teeth by parents and children.

The Framework Convention on Tobacco Control (FCTC) Article 11 recommends graphic warnings labels as a benefit for people with low levels of literacy to understand the health warning (Guidelines for Implementation of Article 11 of the WHO Framework Convention on Tobacco Control, 2008). According to the GATS-2 survey, 71.6% notice the health warning on smokeless tobacco packages and only 46.2% thought of quitting because of the health warning. A participant was able to recollect the brand image of the product rather than the health warning, which shows tobacco dentifrices do not follow 80% coverage. There is a need to monitor the adherence of the health warning labels guidelines in these products. Manipulation on printing the SLT products health warning label has been reported where the image of mouth cancer is selectively or completely blurred, maintaining visual clarity for the remaining parts of the label, suggesting the tobacco manufacturers have the ability to print clear packaging (Iacobelli et al., 2020). Unlike the SLT products like khaini and gutka packs which contain 80% of health warnings, the tobacco dentifrice packs do not follow these guidelines. Therefore, it misguides the users to think it is not a harmful product for oral health. The research lacunae which can be further explored can be awareness on ill effects of tobacco-based dentifrice and health warning on tobacco dentifrice packs.

According to the GATS-2 survey, 33.2% of SLT users attempted to quit in the past, which is in line with our study findings. Only a few participants have attempted to quit, and they were not able to cope with the withdrawal symptoms like craving, irritation, and headache. None of the participants had taken professional help or used any nicotine replacement treatment. This study brings out the real-life experiences, influencers, and beliefs associated with tobacco dentifrice use. Finally, the study also suggests the need for future policy and regulations on tobacco dentifrice sale. The limitations of this study include the unequal gender distribution and the study sample may not be a representation of the general population. Future studies could focus on a wider population for better generalizability of the results.

In conclusion, the present study has explored the opinions and beliefs associated with the tobacco dentifrice use. Family, peers, access to the product, curiosity were important factors to initiate the tobacco dentifrice use. There is a need to create awareness on its ill-effects and remove myths regarding its use. Also the training and capacity building of the health workers regarding these tobacco dentifrice is desired.

Author Contribution Statement

All authors contributed equally in this study.

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