



Review Article

Trends of smokeless tobacco in India- Narrative review

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ABSTRACT

South Asia, primarily India, is the major producer and exporter of various forms of tobacco products worldwide. All forms of tobacco (smoke and smokeless/chewable/inhaled) such as cigarettes, pipes, cigars, beedis, paan and snuff have been implicated in the development of oral cancer. Almost 13% of the population of India chews tobacco in the form of pan or gutkha. People in India consume various forms of tobacco such as khaini, mishri, zarda, gutkha, mawa and naas. Areca nut chewing is also widely practised in India. Males have been found more likely to develop oral or esophageal cancer because of tobacco consumption. Children, teenagers and pregnant women are also found using products for pleasure, stress relieving, in social situations etc. Epidemiological studies also suggest tobacco consumption is more prevalent in lower socioeconomic strata. Oral cancer also called squamous cell carcinoma, oral submucous fibrosis (OSMF), leukoplakia, erosive lichen planus, asthma, chronic obstructive pulmonary disease (COPD) and hypertension are a few major manifestations of tobacco consumption. Smokeless tobacco users studies show mortality of 1.2–1.96 (men) and 1.3 (women). Educational intervention, mass media intervention in the form of television ads, public posters, newspaper articles, folk dramas and the most recent cessation camps have been implied to spread awareness about the misbeliefs of consuming tobacco and demonstrating health hazards associated with it.

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1. Introduction

Tobacco comes from two main species *Nicotiana tabacum* and *Nicotiana rustica*. The most important ingredient nicotine derived from these plants is a volatile alkaloid. Nicotine as we know is known for its addictive and stimulant properties. Nicotine has shown its effects in the entire system, but most importantly, it binds to a central nervous system (CNS) receptor thus increasing brain dopamine levels and making it an addictive agent.¹ Nicotine being addictive is not the only cause of deleterious health hazards but it is the combination of other chemicals. Areca nut used in tobacco products is the seed of the fruit, Areca catechu. It

is the basic ingredient of a variety of widely used chewed tobacco products. Thin slices of the nut may be mixed with a variety of other substances including slaked lime (calcium hydroxide) and spices such as cardamom, coconut and saffron. Most significantly, they may be mixed with tobacco products or wrapped in the leaf of the piper betel plant.² A meta-analysis showed 'betel quid without added tobacco' and 'betel quid with added tobacco' cause cancer of the oral cavity in humans. In the Indian subcontinent, the magnitude of the effect was much higher when tobacco was added to quid than when chewed without tobacco.³ Overall, 52.4% subjects had used smokeless tobacco at least in one form. More males were using smokeless tobacco than females. Knowledge about oral carcinogenic effects of smokeless tobacco was higher in men and in patients

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with non-communicable and infectious diseases. Among smokeless tobacco users, 31.3% tried to quit this habit but failed. The majority of tobacco users started using smokeless tobacco before the age of 15 years; 40.2% and 30.8% started after being inspired by media advertisements and friends/peer pressure.⁴ Educational intervention, mass media intervention in the form of television ads, public posters, newspaper articles, folk dramas and the most recent cessation camps have been implied to spread awareness about the misbeliefs of consuming tobacco and demonstrating health hazards associated with it.

2. Materials and Methods

Our team searched for nearly all relevant randomised controlled trials using Google Scholar (2007-2022) reviewing past 15 years of data. We modified this search on various indexing databases: Cochrane Handbook of Systematic Reviews of Interventions published by the Cochrane Collaboration, Ovid, Embase, PubMed, Scopus. We reviewed previous meta-analysis and the references lists from all retrieved articles for additional studies. Also searches were carried out through web postings from conference proceedings, abstracts, and poster presentations. We also interviewed authors and experts in the specialty.

3. Epidemiology

The prevalence of smokeless tobacco use was assessed in the National Institute on Drug Abuse National Household Survey of residents 12 years of age and older. Overall, 11% of the general population have "ever tried" chewing tobacco, snuff, or other smokeless tobacco. Of these, 6% were former users and 5% used smokeless tobacco almost daily in the past years. The consumption differed significantly by sex, age, race, region, and socioeconomic status. Although females were far less likely to try it, those who did were seen to be chronically addicted thus consuming tobacco almost daily. Youths (12-17 yr old) were more likely than older tobacco users to use both forms of smoke and smokeless tobacco regularly.⁵ The prevalence of both chewing tobacco/pan masala and smoking tobacco was seen to be higher in rural, poorer, and uneducated populations as compared to urban, wealthier, and more educated populations, respectively, in both women and men. India has one of the highest rates of oral cancer in the world due to the high prevalence of tobacco chewing and availability. Forms of chewed tobacco include pan composed of piper betel leaf filled with sliced areca nut, lime, catechu, and other spices chewed with or without tobacco, pan-masala or gutkha which is a chewable tobacco containing areca nut, and mishri which is a powdered tobacco rubbed on the gums as toothpaste by individuals.

4. Consequences/ Clinical Features/ Health Hazards

The main lesions of smokeless or chewing tobacco affecting oral mucosa are: oral squamous cell carcinoma (SCC) (Figure 1), verrucous carcinoma (Figure 2); oral potentially malignant disorders (OPMDs) being leukoplakia (Figure 3), erythroplakia (Figure 4) and erythroleukoplakia and finally tobacco pouch lesion (Figure 6) and oral submucous fibrosis (OSMF) (Figure 5)¹

Adverse complications from smoking during pregnancy have also been documented. There is a considerable increase in stillbirths and a 100–400 g decrease in birth weight of women who chewed tobacco during pregnancy.^{6,7}



Figure 1: Oral cancer affecting the buccal mucosa (squamous cell carcinoma)



Figure 2: Verrucous carcinoma affecting lateral aspect of tongue

5. Interventions

After the knowledge of ill effects from tobacco consumption were known, a lot of methods for intervention were planned to avoid the public from consuming tobacco be it smoke or smokeless. Among various interventions launched the most recent is the introduction of *tobacco cessation camps* which provides patient education to quit tobacco by demonstrating various health adversities and proving a tobacco free zone, group counselling sessions etc.



Figure 3: Oral leukoplakia



Figure 4: Erythroplakia



Figure 5: Oral submucous fibrosis

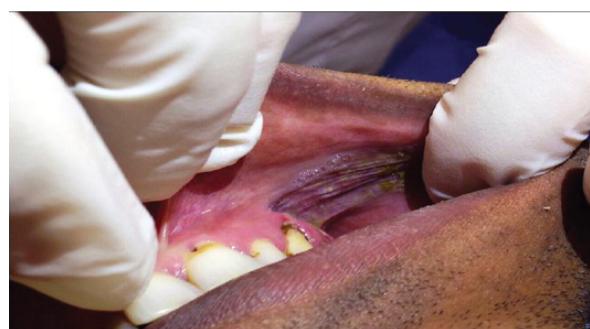


Figure 6: Tobacco pouch keratosis

Randomised trials of behaviour based and pharmacological based interventions to help users of smokeless tobacco to quit, with a follow-up of at least six months have been conducted where *varenicline* and *bupropion*, an antidepressant drug were tested to which patients responded good to varenicline. *Nicotine lozenges* and behavioural therapy also helped smokeless tobacco users to quit.⁸

Mass media intervention in the form of television, public posters, newspaper articles, and folk dramas have also been imposed. *Banning tobacco shops* near educational institutions was also implied.

6. Discussion

We analysed various trends in consumption of smokeless tobacco in respect to gender prediction, form of consumption, reason why people fall prey to consuming tobacco, deleterious health effects and intervention in the category of smokeless tobacco in the Indian subcontinent.

Review suggests different forms of smokeless tobacco: *paan*, *gutka*, *khaini*, *mishri*, *zarda*, *gutkha*, *mawa* and *naas*. We observed a male predilection followed by teenagers and women mostly pregnant to cope up with stress, pleasure and social situations. Lower socioeconomic strata are more prone to indulge in this habit.

Not only tobacco is addictive due to composition of nicotine but is also harmful because of the presence of other chemicals like slake lime, areca nut contributing to adverse health hazards: Oral squamous cell carcinoma i.e oral cancer, leukoplakia, oral submucous fibrosis (OSMF), erythroplakia and tobacco pouch keratosis. Different interventions have been implied over the years including pharmacological intervention by varenicline and bupropion, nicotine lozenges proved to be the most efficacious, mass media intervention demonstrating 'quit tobacco' in the form of public posters, television ads and cinema warnings. To prevent the indulgence of teenagers, the government has imposed a ban on tobacco shops near educational institutes. Studies are still going on tobacco cessation camps if they are helpful. Though the withdrawal symptoms associated with methods of intervention may cause relapse.

We personally feel an increase in tobacco taxes could be a boon to the increasing trends of tobacco consumption both smoke and smokeless.

Any common individual owning a retail licence for the sale of tobacco products is a factor as this sudden shoot up in earning a retail licence easily, has caused expansion of tobacco vendors thus making it difficult to contain any minors access and enforcing any tobacco control measures for the society. Therefore control over licensing will limit the number of tobacco vendors and help in ensuring compliance with the tobacco control laws and regulations.^{9,10}

According to Ruffi Shaikh, Fanny Janssen and Tobias Vogt's study an increase in overall tobacco use in states of India can be attributed to increase in tobacco smoking among men in Manipur (10.85% increase) and increase in smokeless tobacco use among men in Mizoram (15.81% increase) and Nagaland (10.5% increase), and women in Gujarat (27.89% increase) and Manipur (22.71% increase). This trend of continued rise in tobacco use in these respective states are most likely to be related to social and environmental influence such as parental influence, lower educational status, attraction towards role models and cultural practices.¹¹

In women increased likelihood of conception, increased frequency of menstrual abnormalities, and reduced age of spontaneous menopause in women are one of the outcomes reported due to tobacco smoking/smokeless tobacco use.¹²

Regardless of the increased consumption, there have been studies by the Global Adult Survey (2009-2010) to the Global Adult Survey (2016-2017) which suggests declining trend of smoke and smokeless tobacco in India from a 4.5% decline, in prevalence of smokeless tobacco use from 25.9% to 21.4% and a 3.3% decline in smoking, from 14.0% to 10.7%.¹³

7. Source of Funding

None.

8. Conflict of Interest

None.

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