Smoking cessation and its significant role in the Indian scenario

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Abstract

Given the increased health dangers of tobacco use, particularly in developing countries, smoking cessation intervention is crucially important. The aim of this study is to determine and assess the effectiveness of a comprehensive smoking cessation intervention program, incorporating behavior modification, counseling, and pharmacologic treatments, in the Indian scenario. The process of initiating smoking or tobacco cessation begins with the evaluation of the distinct stages that smokers undergo as part of their journey toward behavioral change. There are five different levels of preparation for quitting smoking, *i.e.*, i) not prepared (pre-contemplation); ii) unsure (contemplation); iii) prepared (preparation); iv) action; and v) maintenance. Behavior modification and counseling are essential. The "5 A's"-based intervention uses ask, advise, assess, assist, and arrange as part of its strategy. First-line treatments such as nicotine replacement therapy, bupropion, and varenicline, as well as second-line treatments such as clonidine, cytisine, and nortriptyline, are the foundation of pharmacologic care. Every healthcare professional has a duty to help smokers stop using tobacco, and the intervention should be both therapeutic and diagnostic. Combining behavioral and social support yields the best results, along with pharmacotherapy whenever needed.

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Introduction

Smoking cessation is now urgently needed due to rising tobacco usage and health risks, particularly in developing nations. Smoking cessation will be at different states of readiness [1]. Various theories are related to the origin of the word "tobacco", which is thought to be derived from the Arabic word "tabaq", meaning "euphoria producing herb". Legend has it that the Carib term tabaco, which was also the name of the pipe used to smoke tobacco, is the source of the word "tobacco". The Caribbean Island of Tobago may be where the word "tobacco" originated. Some sources claim that the Mexican state of Tabasco is where this word first appeared. The Mayan word "sikar", which means "to smoke", is where the term "cigare" comes from. In the 16th century, tobacco was introduced to India by Portuguese sailors. Since then, tobacco consumption has increased throughout India. According to the World Health Organization (WHO), tobacco use will be the leading cause of death globally by 2030, killing more than 500 million people. Nevertheless, it is ironic that therapeutic smoking cessation regimens have been demonstrated to be economical even though tobacco use is still the world's largest cause of death that may be prevented. The International Classification of Diseases (ICD-10) classification has designated tobacco dependence as a disease. The medical community has not treated the ailment known as tobacco dependence seriously and has not given this fact any significant consideration. However, it is encouraging to note that the WHO and the Government of India (GOI) have taken the initiative for effective tobacco control [2,3]. The guidelines for smoking cessation have been established by the Ministry of Health and Family Welfare (MoHFW), GOI, as per the standard set by WHO to aid those who wish to embark on this challenging but rewarding journey. These guidelines offer evidence-based recommendations and support, making them an invaluable resource for both healthcare professionals and individuals seeking to quit smoking [4]. The Government has established a National

Tobacco Quit-Line Services (NTQLS) in Vallabhbhai Patel Chest Institute (VPCI), New Delhi with a toll-free number (1800-112-356) and the services have been successfully expanded to regional satellite centers since 2018 and counseling is now available in 15 regional languages at Guwahati, Bangalore, Mumbai. The NTQLS is a confidential, non-judgmental telephonic counseling, information, and referral service for anyone seeking help for themselves or for other relatives who use any type of tobacco product [5].

Second-hand smoke causes harm to those who are around in addition to the smokers themselves. All of the following disorders are connected in children: asthma, gum and dental issues, middle ear infections, and sudden newborn deaths. Lung cancer and heart disease are recognized to be linked in adults. Additionally, smoking causes hundreds of billions of dollars in yearly financial harm that could be prevented if smoking incidence and magnitude were reduced [6]. To better public health, the WHO adopted the Framework Convention on Tobacco Control in 2003 in response to the global tobacco pandemic [7].

Why cessation

The mortality and morbidity linked to tobacco use must be reduced through quitting. By 2050, it is anticipated that there will be an additional 160 million smoking-related fatalities if the primary focus is on preventing initiation rather than cessation. According to predictions made by WHO, the majority of tobacco-related fatalities that can be avoided over the next 40 years will be among current smokers who can be convinced to stop [8].

The first stage in smoking cessation is determining the smoker's level of desire to stop. The 5 A's stand for Ask, Advise, Assess, Assist, and Arrange. Tobacco usage should be inquired about, users should be advised to stop using, commitment and change barriers should be evaluated, users who are committed to changing should be assisted, and follow-up appointments should be made to track progress. Such motivating therapies for smokers who are hesitant to try to quit are built on the 5 R's (Relevance, Risk, Rewards, Roadblocks, and Repetition): i) relevance - encourage the patient to explain how quitting would benefit them individually; ii) risks - ask the patient to list any potential negative effects of smoking; iii) rewards - ask the patient to list the advantages of quitting smoking; iv) roadblocks - request the patient to list any obstacles or barriers to quitting; and v) repetition - the motivating intervention should be repeated each time a patient who is unmotivated encounters with a doctor. Smokers who have attempted to stop smoking in the past but failed should be made aware that it frequently takes several efforts before they are successful.

Indian scenario

India is the world's second-largest user of tobacco products and the third-largest producer of tobacco [9]. With about 7,00,000 yearly deaths in the last 10 years directly linked to smoking, India has the highest tobacco-related mortality rate, and 1 million deaths are anticipated in the next 10 years [10]. In India, 21% of people use smokeless tobacco, 9% solely smoke tobacco, and 5% both smoke tobacco and smokeless tobacco [11]. Smokeless tobacco refers to a tobacco product consumed through methods other than smoking. These methods include chewing, sniffing, or placing the tobacco product between the gums and the cheek or lip. 35% of adults use tobacco in some way. Estimates show that 10 occurrences of oral cancer occur annually for every 100,000 Indian men [12].

Smoking cessation services in India

The Tobacco Cessation Movement in India is gaining strength. As per GOI regulations, tobacco use is now prohibited in public places. This is likely the most important anti-tobacco strategy in recent years, despite the possibility that its enforcement could be improved. The Tobacco Products Bill of 2001, a proposed law, seeks to prevent tobacco companies from supporting cultural and sporting activities. Prior to the first clinic opening there in 2002 as a result of a collaboration between the MoHFW, the GOI, and the World Health Organisation (WHO), there were no official tobacco cessation services offered in India. The first stage involved opening tobacco-cessation centers and developing models for quitting tobacco in India. These clinics had the aim of creating tobacco cessation intervention models for smokers and users of smokeless tobacco, gaining expertise in delivering these interventions, and lastly researching the viability of putting these interventions into practice and their acceptance. All the Tobacco Cessation Clinics used to meet every year to evaluate themselves and formulate future strategies under MoHFW, GOI, and WHO [13,14]. Subsequently, these clinics expanded to include training, community-based awareness programs, and advocacy issues and were re-named as Tobacco Cessation Centers (TCCs) in 2005. Regional Centers for Tobacco Cessation is the new name given to the facilities. According to WHO, the majority of children begin their initial use of tobacco before graduating, beginning in their high school years. Most of the students in the survey (60.9%) initially used tobacco while they were teenagers. This study's conclusion is consistent with one published by WHO. 15.4% of smokers began using tobacco while they were still in school, between the ages of 11 and 15 years. Similar to an earlier study, the main motivations for smoking in this study were enjoyment and fun (69.7%), followed by peer pressure (23.2%). This implies that the primary factors leading to the initiation of tobacco smoking are enjoyment and pleasure, peer pressure, and psychological pressures [15].

There are numerous smoking and smokeless tobacco products available in India, including cigarettes, cigars, reverse chhutta, chumti, hooklis, chillum, hookah, paan, khaini, mawa, snus, snuff, bajjar, mishri, gul, gudhaku, tobacco water, and numerous other regional methods of consumption [16]. Despite all government initiatives to limit and prohibit tobacco usage, it is still widely used in India. In India, 10.7% of people (99.5 million) smoke tobacco now, with 19% of men and 2% of women doing so. Particularly disturbing is the fact that some children as young as 10 smoke. India has the highest rate of oral cancer in the world, and it is clear that tobacco use is the reason. Despite this, India has made progress in recent years to reduce tobacco use, with the population's tobacco use falling from 34.6% to 28.6%. The findings indicate that 49.6% of those who use smokeless tobacco and 55.4% of current smokers intend to quit smoking on a doctor's advice. According to Kumar *et al*., 3.9% of girls and 23.6% of boys at Delhi University smoked cigarettes. The majority of college students used cigarettes (97.6%): 70% of smokers did it for enjoyment and fun, whereas 23.2% succumbed to peer pressure. The survey found that most students began smoking between the ages of 16 and 20 and that some students began smoking as early as the ages of 10-15, indicating that they began when they were of school age. Another study conducted in a medical school found that smoking is the predominant form of tobacco use among medical students for stress relief [17,18].

More than half a trillion dollars in economic losses were a result of tobacco smoking each year. Every economy, but particularly those with middle and low-income levels, is affected by this worrying scenario. Smokers have a higher risk of developing serious con-

ditions such as heart attacks, emphysema, chronic obstructive pulmonary disease (COPD), and cancers of the mouth, throat, lungs, and pancreas. Raising taxes, banning smoking in public places, and other harsher rules are necessary to discourage tobacco use, but at the same time, the right facilities and measures should be made available to assist those who are addicted to nicotine [19].

COPD is a significant issue for public health globally. COPD is often caused by smoking, with a global prevalence of 391.9 million. While in India, it accounted for 255.4 million [20]. According to a World Bank/WHO study, it is currently the fourth most common cause of chronic morbidity and mortality in the United States and is predicted to rank fifth as a worldwide burden of illness in 2020. Smoking is the main etiological factor in COPD. In addition to COPD, smoking raises the risk of acquiring several lung diseases such as pneumonia, tuberculosis (TB), asthma, interstitial lung disorders, pneumothorax, and lung cancer. The ICD-10 classification now includes tobacco dependence as a disease. The medical community, particularly in less developed nations, has not taken the disease of tobacco dependence seriously and has not made significant efforts to treat it. Air pollution from burning wood and other biomass fuels has been cited as a risk factor for COPD in several nations. Significant occupational exposure to irritants such as dust, gases, fumes, and dust are additional risk factors for COPD. Quitting smoking is the most important step you can take to decrease the start and progression of COPD [21].

The most important strategy for reducing the progression of COPD is quitting smoking. The incorporation of smoking cessation as a standard care plan in all chest clinics is urgently required. Thoracic surgeons who are knowledgeable about smoking cessation techniques, pharmaceutical administration, and the use of nicotine replacement therapy (NRT) should handle COPD patients. Bupropion or nicotine gum should be provided to smokers who are worried about gaining weight after quitting as they have been demonstrated to just delay weight gain [22].

NRT is secure and needs to be advised for quitting smoking. After discussing the subject's preferences, a decision on the NRT should be made. When using NRT, the patient is encouraged to stop smoking. The nucleus of the accumbens is hypothesized to produce dopamine as a result of the action of NRT on nicotinic receptors, which are stimulated in the ventral tegmental area of the brain. NRT does not, however, totally cure the signs and symptoms of nicotine withdrawal since none of the medical nicotine treatments, which rely on systemic venous absorption, ever manage to achieve levels of nicotine in the arterial system that are as quick as those found after breathing tobacco smoke. In contrast to pharmaceutical nicotine, which takes several minutes to hours to reach the brain, nicotine from tobacco smoke enters the brain in just a few seconds. NRT has been demonstrated to increase quitting rates by two-fold. It has been demonstrated that the success rates of all NRTs, including nicotine patches, nicotine gum, nicotine inhalers, and nicotine nasal spray, are comparable [23-25].

The NTQLS do not provide any medication, although some quit-lines in other nations do. When NRT was offered as an add-on to telephone-based therapy, these quit-lines had higher stop rates than telephone-based counseling without medication. There are many ways to get help to stop using tobacco, including face-to-face counseling, phone counseling, online counseling, smoking cessation apps, m-Cessation services, tobacco quit-lines, Facebook and WhatsApp counseling, automatic voice recognition counseling, and more. The government has also developed and put into use a mobile-based strategy called m-Cessation (011-22901701) to support and encourage people who want to quit. With this approach, smokers who wish to quit place a missed call to a toll-free number. The tobacco epidemic is taking on a contemporary appearance, ranging from traditional tobacco use, such as khaini and gutka cigarettes, to innovative packaging, such as filtered khaini, low-tar thin cigarettes, and more fashionable electronic cigarettes [16,26].

Smoking is an acknowledged major risk factor for the emergence of TB. There is enough data to conclude that active smoking and TB incidence are directly related. Environmental tobacco smoke (ETS) exposure in children has been linked to an increased incidence of TB [27,28]. Indoor air pollution has several causes, one of which is ETS. Homes with a history of tobacco use in the family had higher indoor levels of sulfur dioxide, nitrogen dioxide, and suspended particulate matter, which is harmful to children's respiratory health. In the opinion of Kumar *et al*., indoor air pollution brought on by passive smoking, secondhand smoke, or other indoor air pollutants results in greater levels of PM2.5 and volatile organic compounds, which may be the root of both pediatric and adult respiratory illnesses. There is a definite connection between binge drinking and cigarette smoking given that 80% of those with alcohol dependence are reported to smoke. Smoking weakens and damages the immune system, making it more vulnerable to infections, and making smokers more prone to infectious disorders. Because their lips and fingers come into touch while smoking, people who use tobacco products are more susceptible to contracting the virus through their mouths while smoking cigarettes or using other tobacco products. Smokers' already compromised lung health makes them more susceptible to a deadly COVID-19 infection. Additionally, smoking with a hookah or water pipe entails sharing mouthpieces, which could aid in the spread of a virus. Smoking cessation programs are among the most economically advantageous of all medical interventions when considering the social and economic effects of tobacco use [29-31].

Approaches and strategies for smoking cessation

Scientific approach

Numerous health promotion strategies are employed for smoking prevention and cessation. Evaluation of several health promotion intervention studies has shown a positive impact on the drop in smoking prevalence. Below are some methods that science suggests for smoking cessation:

Behavioral counseling

Healthcare specialists and stop-smoking advisers offer extensive counseling on how to quit smoking. High-quality evidence from over 300 studies in over 250,000 people shows that receiving stop-smoking counseling increases long-term quit rates [32,33]. The process of behavioral counseling starts with the assessment of the stage as proposed by James Prochaska and Carlo Di Clemente in the transtheoretical approach [34]. Physicians often encounter smokers in their daily clinical practice who, according to the Transtheoretical Model of Prochaska and Di Clemente, fall into the pre-contemplation phase and the contemplation phase, indicating their willingness to change but not yet taking the decisive step of seeking assistance from a smoking cessation expert or a tobacco treatment center. The Very Brief Advice (VBA) is a proven intervention aimed at encouraging smoking cessation attempts among patients. It is extensively employed in both general and specialized healthcare settings in the United Kingdom [35]. VBA can be efficiently achieved by posing only two crucial questions: i) do you smoke? and ii) have you ever

thought about quitting? If the answers to these inquiries are positive, it provides an opportunity to establish a rapport with the patient and explore the possibility of including them in a therapeutic program.

Remote support

The impacts of support provided in person *vs.* remotely, such as through phone or video conversations for counseling, are not significantly different by the studies. There is also growing evidence that stop-smoking support delivered *via* text messages can boost quit rates [29].

Nicotine replacement therapy

This has been used safely for decades to aid smokers in quitting. It can be prescribed by healthcare professionals, but in many countries is available to buy without a prescription from grocery stores and pharmacies [34].

Bupropion sustained release

A non-nicotine medicine called bupropion sustained release (SR) has an abstinence rate that is twice as high as a placebo. Treatment for nicotine addiction in smokers is both incredibly efficient and affordable. It functions by blocking the neurological system from receiving dopamine and noradrenaline. If there is a favorable risk-benefit ratio, the medication can be given throughout pregnancy and is typically well tolerated by those with cardiovascular disease. The two side effects that occur most frequently are dry mouth (10%) and sleeplessness (35-40%). Patients who have eating problems, seizure disorders, or who previously used a monoamine oxidase inhibitor should not take it. Ideally, between the first and second week of treatment, 150 mg orally once a day for 3 days, followed by 150 mg orally twice daily for the following 7 to 12 weeks beyond the stop date. Consider providing maintenance therapy for 6 to 12 months to a subset of patients. It is favored in patients with depressive ideation since research has connected it to decreased post-cessation weight gain. It has been demonstrated to be better than NRTs but combining it with them has no further benefit [19].

Varenicline

It is a medication that helps smokers quit smoking by lessening the pleasure they get from smoking. Additionally, it lessens withdrawal symptoms after quitting. Varenicline approximately doubles the chances of successful long-term quitting [34].

Cytisine

Despite being initially considered a second-line drug according to smoking cessation guidelines, cytisine (CIT) is gaining recognition for its exceptional performance as a first-line medication, even after the withdrawal of varenicline from the market. Derived from the seeds of *Cytisus laburnum*, a common garden plant found in central, eastern, and southern Europe, CIT is an alkaloid that has been employed for smoking cessation in eastern European regions for over 6 decades. CIT exhibits a chemical structure and pharmacological effects strikingly similar to those of nicotine and varenicline [36].

Combining medication and behavioral support

Studies show that using both behavioral support, such as counseling, and medicine, such as NRT, increases quit rates more than using either alone [34].

Cut down on smoking

Smokers can try cutting back on their smoking if they believe they are unable to completely stop. Evidence shows that if someone reduces how much they smoke, they are more likely to successfully quit in the long term [34].

Social approach

Some of the social methods which assist in smoking cessation are detailed below.

Peer education

This "involves sharing of information in small groups or one-to-one by a peer matched either demographically or through risky behavior to the target population" [37]. The fundamental theoretical underpinnings of the peer education method are the information, motivation, behavioral skills, and resources model and developmental theory. Theories of engagement in education and behavioral theories pertaining to health are some further theoretical underpinnings.

Theatre in health promotion

The theatre offers a potent platform for disseminating messages about healthy living and increasing public awareness of the need for health promotion. Due to the audience's active participation and support of the actor, the theatre offers an intriguing strategy. The actor, who is integral to the dramatic narrative, explores the chosen topic as a relationship between facts and fiction [38]. The theatre method is premised upon drama theories and social cognitive theory, which recognizes human behavior as an interaction between individual aspects, behavior, and context [39].

Media advocacy

Media advocacy is best described as using the media as a platform to advance a cause. Information is disseminated through the media to alter public minds or change their views [40]. Media advocacy needs to be based on the solid principles of planning, which use the "GOTME" approach: goal, objective, target, message, and evaluation.

Community mobilization

By utilizing a variety of sophisticated interventions to encourage community members to become more conscious of their environment, community mobilization seeks to change social norms. Collaboration, educational entertainment, participation from other members, and support from organizations and associations all contribute to bringing about the revolution. Community mobilization is based on three key concepts: social capital, empowerment, and social change [41].

Motivational interviewing

Motivational interviewing (MI) is characterized as a client-centered, directive strategy to promote positive behavior change and eliminate ambivalence. MI's key guiding concepts include building discrepancy, showing empathy, promoting self-efficacy, and rolling with resistance. Some forms of MI include motivational enhancement therapy, brief MI, and telephone counseling.

Mass media campaigns

These are regularly used to reach the general public with mes-

sages through newspapers, radio, and television. Such campaigns are an effective way to bring up a topic and promote discussion, and they have the potential to affect populations' health-related behavior for the better or worse. Mass media campaigns should be included as a key component of approaches to improve population health behavior [42].

"RAJKUMAR" strategy

Since November 2001, the Delhi-based VPCI has offered cigarette cessation therapy. Tobacco users who have enrolled at the VPCI's TCC have received medication and counseling services for quitting smoking. The "RAJKUMAR" intervention strategy adopted by the Institute includes scientific essentials of a tobacco cessation treatment plan: RAJKUMAR (R = Reaching the subject, A = Assess the stage of change, J = Judge the severity, K = Know the risky situations, U = Use coping skills, M = Medication required or not, A = Arrange follow up, R = Re-evaluation) [21].

Future perspectives

The current methods for smoking cessation range from direct advice through counseling to medicines. When used separately, counseling and medicine are beneficial for treating tobacco dependency, but when used together, they are much more successful. The use of both counseling and medication should therefore be recommended by clinicians to everyone who is trying to quit. Notably, cessation programs are among the most cost-effective medical treatments.

Even for those who have a great intention to stop using nicotine, the substance's strong addictive properties present a significant obstacle. Only about 3-5% of smokers who make an independent attempt to stop do so for longer than 6 months [43]. About 80% of them relapse within the first month after quitting. The pharmacologic effect of nicotine primarily causes tobacco addiction; hence, it is essential to treat this part of tobacco dependence using pharmacotherapy to boost success rates. People who are trying to quit can benefit from adding a pharmacologic agent to prepare to stop because it will lessen their withdrawal symptoms, cravings, and psychological conditions. A study was done by Pezzuto *et al.*, and the primary strategy to alter the course of the disease and lower the annual rate of forced expiratory volume decline is quitting smoking. When a COPD patient successfully quits smoking, triple therapy treatment becomes more effective. In another study, Gill *et al*. found a correlation between the pondering ratings on the three visits in our study. Similar findings were reported in a study by Ha and Choi, who demonstrated that the experimental group had a noticeably higher stage of change than the control group [44,45]. Another interesting finding that came out from the Gill *et al.* study was the mean number of cigarettes smoked per day. It was seen that the mean number of cigarettes smoked per day was 6.12 on the first visit, and after 2 weeks, the mean number of cigarettes smoked per day was 4.73 [46]. This strategy also improves respiratory function and symptoms in the near term. There are first-line (NRT, bupropion, and varenicline) and second-line (nortriptyline, clonidine, *etc*.) pharmacotherapies for treating tobacco dependency, according to current clinical practice guidelines. On their own, first-line medications are only marginally more effective than a placebo, but they can greatly boost the effectiveness of psychotherapy [47].

Helping smokers is difficult, which reflects the persistent relapse nature of tobacco dependence rather than a failure on the part of doctors or their patients. To effectively negotiate the challenging road to quitting smoking, the patient's therapy collaboration with his or her cessation specialist must be supportive and motivating. The creation of this alliance is significant because it can promote long-term treatment compliance and achieve the greatest use of personalized treatment plans. Nevertheless, the presently marketed tobacco cessation products (*i.e*., NRT, bupropion, and varenicline) increase the chance of smoking cessation, but they lack high levels of efficacy (particularly in real-life settings) [48], showing a wide variation in success rates across studies, with some of them associated with significant adverse side effects. To overcome this gap, numerous pharmaceutical companies and academic institutions are researching cutting-edge smoking-cessation drugs that interfere with nicotine signaling, many of which are currently in the clinical development stage. We are excited to learn about their effectiveness and safety. Despite these advancements, efforts should be focused on locating fresh targets, evaluating novel strategies, and figuring out how to make the greatest use of what is already accessible. Regarding the latter, it is highly desirable to acknowledge smokers' preferences for route and schedule of administration and the identification of individual traits that predict the success of these treatments, as doing so may help match smokers with a strategy that will help them quit, identify smokers who may require more intensive treatment, make the most of available medical resources, and improve state-funded anti-tobacco policies [34].

Conclusions

Smoking tobacco remains a serious public health problem that increases preventable illness and mortality on a global scale. Tobacco control techniques should be regularly followed to reduce the prevalence of tobacco use and, consequently, the burden of illness and mortality caused by tobacco use. Professionals in oral health have a unique chance to participate in tobacco control activities and cessation programs because there is a strong connection between mouth illnesses and tobacco use.

The NTQLS and TCC of VPCI have been working relentlessly to help people get rid of tobacco and smoking addiction. Services from tobacco quit-lines operate in both reactive and proactive modes. Callers are linked to one of the counselors or quit coaches operating out of the quit-line office after placing the call, which is done by a tobacco user. These services are intended to encourage people to give up tobacco and lead healthier lives. All medical professionals, researchers, nongovernmental organizations, government agencies, and educational institutions, including universities, colleges, and schools, should speak up to save our children and our nation from the growing threat of tobacco use.

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