

**ASSESSING THE EFFECTIVENESS OF SMOKING CESSATION
INTERVENTIONS**

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Abstract

Background: Smoking remains a leading global public health challenge, responsible for significant morbidity and mortality, particularly through its strong association with lung cancer and other chronic diseases. Despite widespread awareness of its harmful effects, cessation rates remain suboptimal, necessitating the development and evaluation of effective intervention strategies.

Methods and Materials: This study synthesizes evidence from systematic reviews and clinical research on smoking cessation interventions, including pharmacological treatments such as nicotine replacement therapy (NRT), varenicline, and e-cigarettes, as well as behavioural interventions like counselling and structured support programs. It also examines implementation strategies within primary care, hospital, and community-based settings, alongside barriers affecting both healthcare providers and patients.

Results: Findings indicate that combined approaches integrating pharmacological and behavioural interventions yield the highest cessation success rates, reaching up to 24% annually, compared to significantly lower rates in unassisted attempts. Pharmacological combinations, particularly NRT with varenicline or e-cigarettes, demonstrated enhanced effectiveness in reducing cravings. Behavioural strategies, including intensive counselling and personalized support, further improved outcomes. However, implementation remains hindered by constraints such as limited time, insufficient training, financial barriers, and patient-related challenges including fear of withdrawal and relapse.

Conclusion: Smoking cessation interventions are effective but underutilized due to systemic and individual barriers. Optimizing their implementation through improved healthcare infrastructure, increased funding, and tailored patient support is essential to enhance cessation outcomes and reduce the global burden of tobacco use.

Keywords: *smoking cessation, nicotine replacement therapy, behavioural interventions, e-cigarettes, abstinence rates*

Introduction

It is no secret that the global tobacco epidemic poses as one of the main public health challenges due to the fact that it is spread everywhere like a plague, which leads to worse diseases, many of which are causes for mortality for the human race. To give an example, it has been reported that 80-90% of lung cancer deaths are linked to cigarette smoking, which is the leading risk factor for the development of this cancer.

Furthermore, the public health sphere has already identified the harmful effects and negative outcomes of smoking, regardless of its type, and has already devised and implemented various interventions to try and raise the awareness of the population to this issue and try to put a stop to its damage and to limit its vicious spread where it has not left any age group except that it has inflicted its harm whether by active or passive smoking. Even neonates and infants are affected by it if their mothers smoke during their pregnancy. A wide array of programmes have been introduced into the population including awareness programmes, workshops and interventions including ones using pharmacological therapy.

With that said, many of those who smoke wish to quit and drop this harmful habit, but not everyone is successful due to a low percentage of them using evidence-based treatments such as nicotine replacement therapy and behavioural support. Also, due to this issue remaining at large and worsening over time, public health authorities are increasingly aware of it and are developing new methods to improve their effectiveness in addressing it.

Intervention strategies

One of the methods thought to be ideal in helping smokers quit their harmful habit of smoking is the involvement of primary care practitioners in the withdrawal process due to the fact that primary care has a very wide reach where most of the populations comes into contact with a primary care physician and they usually trust those general practitioners whom many of them visit on a regular basis due to various reasons including chronic diseases follow-up. The objective of those healthcare professionals is to offer frequent advice to patients, and some strategies have been developed to support this. For example, one follows a system of five As (Ask, Advice, Assess, Assist, Arrange), in which the physician applies these 5 steps when interacting with a smoking patient; another follows the “Very Brief Advice” guidelines. However, it is quite problematic that these 2 strategies are usually not implemented by

physicians, and if they do implement them, they fail to provide sufficient support to the patients in other words, they fail to implement them effectively due to different reasons such as inadequate assessment of the patients' tobacco use, or they are simply overlooked for various external reasons such as increased workload and not having enough time to go through all the patients' risk factors and trying to deal with them individually. Usually, these behavioural support options range from just a brief advice by the doctor to the patient if he just has risk factors or is just a new smoker, to more intensive counseling sessions for heavy smokers and those who have severe difficulty in quitting smoking and these interventions are under improvement because it is difficult to assess which of the specific components are the most important for achieving the desired goal of these components as motivational techniques, the mode of delivery, or the intensity of the sessions. With that said, many of the healthcare providers failed to perform the task, especially those who work in cardiac oncological centres or deal with such patients, a lot of them usually miss the opportunity to teach the patient the consequences of this negative habit, and to encourage to stop, which then leads the patient to go on his streak of smoking which would eventually lead to him developing serious life-threatening diseases.

There are other various strategies, such as the use of pharmacological interventions, which involve the use of Nicotine Replacement Therapy (NRT), such as nicotine gums and patches. Also, some researchers have tried to analyze the effectiveness of using e-cigarettes to help patients or smokers stop smoking. However, such researchers need comparative data to guide policymakers toward effective decisions that can help reduce their spread. The main intervention strategies will be discussed further in this section.

Primary Care Intervention Programmes

A group of researchers conducted a systematic review of 49 articles and identified the main strategies implemented by these studies, concluding that the main strategy groups were financial strategies, infrastructure changes, stakeholder training and education, and consumer engagement.

The strategy division involving financial strategies showed a significant effect on smoking cessation at the patient level. Moreover, the financial strategies, changing infrastructure, and educating and training stakeholders divisions have increased the rate at which physicians note

and record the patient's smoking status and the rate at which they provide advice for the patient to stop smoking.

Among the factors that have facilitated these strategies were external policies such as funding for public health and cessation clinics. Whereas the main obstacles were time and financial constraints. Even though there was funding in some studies, many institutes had a deficiency in funding, and this was further manifested by the lack of free medications that would aid in stopping smoking, such as those in NRT. Other obstacles were a lack of follow-up and not giving clear priority to those patients who are at high risk, having ambiguous targets in the primary care setting, and healthcare professionals lacking knowledge and unable to deliver clear messages to the patients about the available options that could aid in the cessation of smoking.

Use of pharmacological interventions & E-Cigarettes

A group of researchers have studied different methods to analyze which is the most effective between medicines and E-cigarettes in aiding smokers to quit. They concluded that even though they both have a good effect in helping smokers quit smoking for 6 months or longer. However, they found out that a specific combination of both these methods has provided a good outcome; they concluded that the use of E-cigarettes and medicines, more specifically, cystine and varenicline, was effective in helping the majority of the participants quit smoking. Second in line was the use of two types of NRTs at once, for example, a nicotine patch and a gum or a lozenge. The use of these methods helps by decreasing the desire to smoke and the craving for it. They also noted that the medications and E-cigarettes can be used with behavioural support.

However, they noted that more evidence is required to identify if the E-cigarettes have long-term negative consequences on the body, but in their study, there was a very low number of harms that were reported. Moreover, they noted that some medicines are unavailable in many countries, and varenicline is in short supply due to manufacturing issues. They also noted a small number of negative effects across the different tests. And when compared to placebos, most of the treatment methods were prone to being easily monitored and controlled with regard to safety. The research showed a positive outcome: effectively improving the economy by reducing healthcare costs and lowering economic costs.

It goes without saying that quitting smoking is one of the most difficult challenges to overcome, and a lot of people require repeated attempts before they succeed. While pharmacotherapy is

effective and is a necessary component in withdrawing from smoking, behavioural support also plays a significant role. However, these interventions regarding the behavioural support differ greatly in terms of content and delivery. An overview of more than 30 reviews and more than 300 trials to single out the effective elements of behavioural support. The overview has concluded that there is sufficient evidence demonstrating the success of individualized counselling and ensuring that the patients will receive monetary incentives for demonstrating progress in abandoning smoking. With that said, some aspects of the individualized counselling played an important role in aiding the patient's quit, namely, the intensity of the support provided in the counselling sessions. The researchers have mentioned that more intense sessions led to better success rates and more intensive sessions means more frequent contacts with the patients or longer duration of the sessions. Furthermore, the use of additional methods to deliver information, as well as tailoring it to each patient, has helped patients quit. Such methods include mobile text messaging.

Lastly, the researchers have focused on the high-risk patients by identifying them and revealing cases in which they could relapse, and then tackling such cases by teaching the patients various strategies to cope with their cravings.

Effectiveness of the smoking cessation interventions

As seen in the studies described in the previous section, researchers have sought to devise various strategies to help smokers quit this harmful habit. Along with introducing stable strategies to aid them in maintaining a constant abstinence after they have already achieved an initial abstinence. Even though the prospect of these interventions is quite promising, they have significant shortcomings that prevent them from reaching their full potential.

There is a clear distinction in the effectiveness rates described among the different cessation strategies. This indicates that a structured medical and psychological intervention strategy drastically surpasses unassisted attempts, also known as "cold turkey". The "cold turkey" path is the most utilized way by people who attempt to quit smoking. According to the statistics, it is the least effective path. Success rates have shown that 3% to 5% of smokers remain smoke-free after one year. When compared to behavioural monotherapy, one can clearly notice that smokers who solely follow behavioural strategies are more likely to quit smoking than those who do it on their own, with the success rates being 7% - 16%. Moreover, it is proven that using a combination of

both therapies, meaning using both pharmacological interventions along with behavioural support, is the most effective, with success rates reaching 24% over a year. With regard to the pharmacological NRT, it was noticed that using a standard nicotine patch along with a short-acting NRT form, such as gum, increased the abstinence rate by 5% when compared to using a NRT as monotherapy. In addition to that, E cigarettes containing varenicline have shown a 44% abstinence rate over 4 weeks, which is much higher than those containing bupropion, which demonstrated 29.5% abstinence rate over 4 weeks, and the E-cigarettes containing a placebo, which have achieved a 17.7% abstinence rate over 4 weeks. This shows that the most effective combination with regard to pharmacological therapy is the use of varenicline and NRT (a short-acting NRT along with a nicotine patch), as this combination has given the greatest efficacy results.

Strategies for implementing the interventions described can be grouped into hospital-based and community-based, and each group uses its own methods to reach its target population, which differs for both groups.

The hospital-based strategies include integrating a system in which the physician provides advice to the patient who is a smoker. This advice can be brief but should be accompanied by comprehensive cessation treatments with proven long-term success rates. Another technique is the use of electronic medical records, which can identify known smokers and aid in creating automated messages for healthcare providers or in sending notifications to help them become more aware and implement other strategies. Moreover, to effectively implement these strategies in the health care setting, a number of specialized staff members who specifically address this issue are required. Alternatively, the general physicians could be appointed to this task should they be given more working hours and the required support. Lastly, healthcare institutions require funding, and government funding may be standard in many cases; however, some institutions have managed to gather internal resources to develop the systems and structures needed to perform these tasks.

With regard to community-based strategies, the Courage to Quit Programme (CTQ) can be implemented; it is a racially diverse intervention focused on the urban setting. It utilizes orientation and psychoeducation sessions to reach its goal, which is to help smokers quit. This programme has a high feasibility rate of 75%, an acceptability rate of 95%, and a quitting likelihood of 36%. Furthermore, implementing this programme requires personal therapy, quit

classes, and telephone quit lines to provide smokers with access to behavioural support, ensuring the programme's consistency and effectiveness.

Overcoming implementation barriers

The research regarding cessation interventions and their effectiveness, and how to implement them, has provided a vast amount of information; however, moving from these investigations and research and into implementing them in actual practice is a difficult task that is faced with many obstacles and challenges that both the healthcare providers and the smokers have to deal with.

From the barriers faced by healthcare personnel who are at the front line of implementing these strategies, the first barrier is insufficient time, along with a high workload burden. Physicians usually do not have meaningful interactions with patients for several reasons, namely, not having enough time to adequately address each patient, which means they are unable to introduce the patient to different cessation interventions that could help him quit smoking. Furthermore, the available staff in a healthcare institution could be lacking with regard to the knowledge, training and the protocols that are required when dealing with the smoker, and this issue could fall back to the administration of the hospital who is not providing sufficient training programmes or workshops to refresh the staff's knowledge regarding this. For these reasons, the hospital must either aid the physicians in effectively dealing with each patient, or increase paid working hours or introduce a specialized staff workforce that addresses this issue specifically. Also, the hospital needs to frequently run workshops and programmes to refresh staff's knowledge of available smoking cessation techniques, how to implement them, and how to introduce them to patients, as well as the barriers they face and how to overcome them.

As for the smoker himself, he faces challenges that may stop him from starting the journey to quit, and some of these issues are, for example, the lack of an incentive to stop smoking or simply the patient may just fear the process of quitting itself. Moreover, some patients stop during their journey due to the fear of side effects that they may encounter from the medications that they use and it is incumbent upon the physician to elaborate and provide the patient information regarding these medications and how to use them and explain to them the effectiveness and describe to them in the greater goal that they are trying to achieve along with

providing empathy and helping the patients manage their expectations. Furthermore, some patients may fear gaining excessive weight or having high stress levels, which is why behavioural support must be integrated into the cessation intervention.

Lastly, the cost of using the different pharmacological drugs and nicotine replacement therapy is a barrier for many patients, especially those who come from a low socioeconomic background. This is why the government, as well as healthcare institutions, must be vigilant to ensure that funding is available for those who wish to quit, especially those who need it the most.

Another form of barrier encountered by smokers comes from their environment. An example of this, which is a common cause for smokers to relapse, is that his friends, whether at work or in his social gatherings, pressure him to smoke, and this is known as peer pressure. For this reason, the programmes should include group participation so that each individual can help others reach the goal of quitting smoking.

Conclusion

Tobacco smoking still remains a global public health disaster that needs to be addressed effectively and rapidly to limit its dangerous spread, which has gone on for far too long. The interventions that were already studied and devised to help smokers quit this harmful habit have shown good success rates and have good potential but as was described, their implementation remains to be the greatest issue which, if not treated, will continue to allow this issue to cause the great healthcare, economic and social burden that it has already excelled in achieving and maintaining. For this reason, policymakers, healthcare institution administrators, governments, public health workers and healthcare providers must work together to implement these strategies effectively as well as to overcome the barriers and obstacles that are in place so as to be able to finally put an end to this issue and to focus on more pressing problems which require much more attention and action.

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