# The Problem and Effectiveness of Abrupt Cessation and Gradual Cessation for Smokers Who Want to Quit

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**Abstract.** Smoking has become one of the critical factors endangering human health. Under increasing personal health threats, many smokers have tried to escape from this habit. For those who want to quit smoking completely, whether adopt abrupt cessation or gradual cessation has been a controversial topic for many years. Abrupt cessation refers to quit smoking abruptly, without any nicotine intaking in the cessation period. Gradual cessation refers to quit smoking gradually, lowering the nicotine intake through the cessation period. So far, in this field, many researchers have stood with the opinion supporting the abrupt cessation, saying that abrupt cessation is effective in reducing smoking behavior and the chance of relapse. This article reviews the existing papers, aiming to evaluate the supporting information on abrupt cessation and gradual cessation, and give out an overview of existing controversy. The result suggests that the effectiveness of abrupt cessation cannot be neglected. However, through the consideration of smokers' preferences, the severity of being addicted, and drug intervention, gradual cessation may play a more critical role.

**Keywords:** Abrupt cessation; gradual cessation; smoking cessation; behavioral motivation; varenicline therapy.

## 1. Introduction

The behavior of smoking has a long-time history, and so does abstinence from cigarettes. In today's scientific field, many researchers have drawn the question of how to quit smoking properly and efficiently. There are two types of cessation, which are abrupt cessation and gradual cessation. Whether stopping smoking abruptly or gradually will be more effective has been a controversial topic for those who are eager to quit smoking. In most cases, ordinary people may want to quit gradually because they think this method involves fewer withdrawal symptoms, which means it might be easy to quit completely. However, some experts may reject this thinking, that abruptly stopping smoking is more likely to generate a better result [1].

The general guidelines advise stopping abruptly [2,3], although most people may choose the gradual cessation of smoking at first. In fact, abrupt cessation and gradual cessation of smoking have been investigated for many years. These studies compared abstinence rates, withdrawal symptoms, or basic theoretical explanations to determine which is more suitable for people to quit smoking, abrupt cessation or gradual cessation. At the most condition, they have put evidence that abrupt cessation can result in longer time abstinence for smokers. On the contrary, gradual cessation may be more effective than abrupt cessation at some particular conditions. This paper aims to analyze the result of recent research, make the conclusion that abrupt cessation is better for quitting smoking to what extent and support the argument that gradual cessation may by a fitter type of cessation be used. Besides, the methodology and study format for these research will also be evaluated in order to give recommendation for future researchers and show the problems faced in this field recently.

## 2. Abrupt cessation may not be more effective

### 2.1 Support the abrupt cessation

The existing researches on investigating the effectiveness of abrupt cessation are more focused on comparing the abstinence rate with gradual cessation. Researchers divide the participants into two groups for experiencing abrupt cessation and gradual cessation. The participants in the study had

significant characteristics of smoking addiction (smoking for at least three years). Meanwhile, they also had a relatively strong willingness to quit smoking. During the cessation part, there are specific ways to detect participants' smoking behavior: participants are looked after by the nurse or professional clinical staff; researchers get the phone report from the participants; participants meet with the researcher at regular intervals. As a result, abrupt smoking cessation is more likely to lead to prolonged abstinence compared to gradual cessation [1]. In the following similar studies, three randomized controlled studies all compared the abstinence rate for two cessation groups, including 1607 participants, with the same result supporting abrupt cessation as a better-quitting strategy [4]. The author suggested that the abstinence rate for the gradual cessation group keeps low throughout the entire quitting period [4]. The study used a straightforward method to compare the effectiveness of both types of cessations, which is to compare the abstinence rate for two groups after the randomization of participants. The strength of abrupt cessation can be clearly shown, which is also the reason for the general guidelines to support this type of cessation.

### 2.2 Latent problems in methodology

However, these pieces of evidence still have some risks to make them less supportive. The number of subjects is good for explaining the effect of abrupt cessation on smokers, but the diversity of the sample is hard to give generalizable evidence. Every country has its own culture regarding smoking, and smoking habits, resulting in a different abstinence rate when applying the same study to another country [1]. For example, participants in Chinese culture may have a different result in the investigation of abrupt cessation and gradual cessation. A retrospective, observational cohort study involving 278 Chinese participants with moderate to severe smoking addiction suggests that the abstinence rate is lower for the abrupt cessation group compared to the gradual cessation group [5]. So far, many studies provide evidence from other ethnicity and give out different opinions, but they are not complete replicational studies. In the study mentioned above [5], researchers introduced a pre-cessation varenicline therapy to assist both types of cessation groups. How much ethnicity can explain the result in this study is unknown because the variable of pre-cessation varenicline may account for more. The critical evidence for detecting the ethnicity of the sample for quitting strategy is absence, or in another explanation, the effect of ethnicity difference is not powerful to affect the smoking abstinence rate for both groups. Nevertheless, this field still needs a diverse sample to make the result more generalizable.

In the previous study of Lindson et al. (2016), the researcher only used one strategy for a gradual cessation group through 6 quitting months [1]. The non-diversity of strategy may limit the result that the abstinence rate for gradual cessation can be affected in multiple ways. The recent outcomes suggest that there are many strategies that can be chosen for those who want to quit smoking gradually, which may result in different abstinence rates [6]. To test whether the change in the type of gradual cessation strategy can raise the abstinence rate, Lindson et al. (2020) give out four types of strategy for the gradual cessation group: cut down the most difficult or most accessible cigarettes at first, smoking on an increasing time schedule or not a specific schedule. In terms of these strategies, participants show different levels of abstinence rate, but there is no significant data to support either one of them has the capability to exceed the abstinence rate of the abrupt cessation group. This founding answers recent criticism on the possibility that different types of gradual cessation are more effective and gives good support to the effectiveness of abrupt cessation. Due to the considerable potential variation of the gradual cessation strategy, there are many miss parts needed solid evidence for comparison of gradual cessation and abrupt cessation [6]. Apart from the types of gradual cessation for people who want to quit, motivation also has a significant potential variable to affect the abstinence rate.

### 2.3 Controversy for motivation of smokers who want to quit

Comparing the abstinence rate for both groups is a good way to figure out which strategy is worth using, but it cannot find the factor which affects the participants to show different levels of abstinence

rate. Motivation plays a critical role in quitting smoking, and it is complex for researchers actually to know the effectiveness of motivation. Wee et al. (2011) claim that those who have higher motivation and spontaneity to quit smoking have higher abstinence rates [7]. Although those in both cessation groups have a high level of motivation to quit initially, their motivation is reduced during the cessation period, and the reduction for the gradual cessation group is faster than that for abrupt cessation group [7]. In the earlier study of Lindson et al. (2012), they point out the importance of choosing those who want to quit smoking as participants based on the motivation of willingness to get rid of cigarettes completely [8]. However, the author did not go into deep about participants' motivation in their following studies. Some critique the lack of the specific implementation of participants' spontaneity for the study of Lindson et al. (2016) or this kind of study. When the motivation of participants is affected, the abstinence rate for both cessation groups may be changed.

Some earlier studies have connected motivation and two types of cessation, saying that abrupt cessation may not be the best strategy in certain conditions [7,9]. Participants were randomly assigned to the abrupt cessation group and gradual cessation group, with a high preference for each group. For those who have no preference for either group, their abstinence rate has no significant difference for both groups [10]. This may recommend to the following study that the difference in abstinence rate may result from the motivation attached to one of the cessations. Theoretically, having higher motivation and preference for one group may raise the abstinence rate, hence it brings a question on which is more effective under the condition that participants have the full preference for the type of cessation they have chosen. Mokhtar et al (2022) argue that, in the long term, the abstinence rate of participants in both groups has no difference if they are in their preferred group [9]. The result of this study provides a piece of different evidence in this field which involves the consideration of participants' preference but concludes that the abstinence rate is more likely to be affected by smokers' behavioral characteristics or demographic. These pieces of evidence reflect that the critical point that may rely slightly on making a difference between gradual cessation and abrupt cessation, but to make the improvement for either strategy, increasing the abstinence rate for those who want to quit.

### 2.4 The effect of drug intervention

In addition to the investigation on how motivation could affect abstinence rate either in gradual or abrupt cessation, some reports did investigate the utility of drugs in abrupt cessation instead of only emphasizing the final abstinence rate for both types of cessations. Existing findings show that patients who experience abrupt cessation may have a higher level of side effects from drugs and withdrawal symptoms than those who experience gradual cessation. The risk and side effects generated by abrupt cessation are more likely to be headaches, insomnia, and nausea [5]. Relatively milder withdrawal symptoms were found in the gradual cessation group [5]. A similar result can also be found in an earlier prospective clinical study in China, including 314 moderate and severe nicotine addicts. The adverse drug reaction, including gastrointestinal discomfort, dreaminess, and nausea, was more found in the abrupt cessation group [11]. In both studies, the abstinence rate for gradual cessation keeps higher than that for abrupt cessation through 1 month, 3 months and 6 months. The reason for that may be side effects brought by the adverse drug reaction together with the increasing withdrawal symptoms, affect negatively to patients in the abrupt cessation group [5,11]. Not like the studies mentioned at the beginning of this paper, these studies introduce the drugs into the comparison between abrupt cessation and gradual cessation and also explain the difficulty of withdrawal. The participants are those who are most likely to be severe addicts, which may result in a question that severe nicotine addicts may have higher withdrawal symptoms, impeding them from quitting completely. In that case, a question may be revealed that gradual cessation is more effective for this type of patient even though there is no drug intervention.

Without drug intervention involvement or other drug-based therapy, an investigation including 28,156 adult smokers in French supports the above argument. This study investigated the prevalence and predictors of smoking cessation among smokers seeking treatment. The participants made their own choice of group allocation based on their preferences. Some of them still choose not to quit

completely, which is the control group. Except for the smokers' preference to quit, the cessation for smoking is detected to be associated with the smokers' age, level of being addicted, low self-efficacy, previous quit attempts, intake of other medication, depression, and anxiety [12]. The abstinence rate for both groups could be affected differently, but for those severe smokers, the best way is to quit gradually [12].

Severe smokers commonly may have other complications, like chronic obstructive pulmonary disease (COPD). It is a kind of chronic bronchitis and/or emphysema with airflow obstruction characteristics, which can further develop into a common chronic disease of pulmonary heart disease and respiratory failure. Abrupt cessation has an obvious drawback for the severe smoker and also for those who have multiple complications. Research studying Varenicline therapy on COPD patients suggests that the gradual cessation group gives a significantly higher continuous abstinence rate [13]. Varenicline therapy aims to reduce nicotine addiction by reducing withdrawal symptoms and cravings. The longer duration of varenicline therapy is related to a high abstinence rate [14]. Through the comparison, the abrupt cessation of the varenicline therapy may not be more effective, also, for the nicotine replacement therapy, the abrupt cessation group shows a lower abstinence rate [12]. The abrupt cessation showed the weak side of this condition because the subject in abrupt cessation had to deal with the withdrawal symptom and the symptom of complications simultaneously.

## 3. Overall evaluation

The studies, which purely made the comparison of abstinence rates for abrupt cessation and gradual cessation, lack consideration of withdrawal symptoms and severity of nicotine addiction. These studies concluded that abrupt cessation is more effective than gradual cessation [1,4,6]. However, the participants in these studies are adult smokers who are detected as having smoking addicts, instead of distinguishing them with different severity of smoking addiction or using the severe participants. There is a practical difference between mildly addicted participants and severely addicted participants. They share different withdrawal symptoms or complications, which can variably discourage the participants from recovering. Also, for the earlier studies which use motivation and self-efficacy to explain the drawback of gradual cessation, the emphasizing point is not to improve the abstinence rate or improve the current strategies but to make a simple comparison. Although the evidence shows that abrupt cessation increases the abstinence rate for participants who want to quit and gradual cessation impedes the motivation of the participants in this group [7,8], in the following study, Mokhtar et al. (2022) give out the opposite idea [9]. Hence, the most important evidence may be that motivation will affect the cessation of smoking, not distinguish the types of cessations. Nevertheless, when the condition moves to severe smokers or the smoker with severe withdrawal symptom, deciding whether use abrupt cessation or gradual cessation becomes more complicated.

As the general guideline said, abrupt cessation is a good strategy that can be used to quit smoking [2, 3]. This may be because the current comparison study of abrupt cessation and gradual cessation includes the most general smokers. These studies have not clearly distinguished smokers by their severity of addiction to cigarettes. So they can be informed of those who want to quit at the first step of cessation. Also, due to the consideration of withdrawal symptoms and other variables, those with lighter addiction to nicotine may use abrupt cessation to quit smoking. For the clinical or for the severely addicted to nicotine, abrupt cessation is not recommended, as there are more risks to affecting their well-being and success of quitting. In this case, the treatment may include the reduction of withdrawal symptoms and drug intervention. The types of cessation may be used to assist smokers in doing better varenicline therapy. There are mature pieces of evidence to demonstrate the effectiveness of drug intervention for smokers who want to quit. Gradual cessation coordinated with varenicline therapy has more chance to reduce the withdrawal symptom and increase the overall abstinence rate [5,11,13]. The suggestion is that those who have a severe addiction to nicotine or have other complications can be recommended to use this strategy.

## 4. Conclusion

By concluding the existing research on quitting smoking strategies, this paper excogitated that abrupt cessation may have the strength to quitting cigarettes. The latent evidence, including the consideration of participants' preferences, shows that abrupt cessation is still the most effective strategy for quitting smoking. However, this result only is qualified under some conditions. The abstinence from smoking may be affected by the severity of addiction, drug intervention, and withdrawal symptoms. Abrupt cessation is said to be the best-quitting strategy for everyone, but it is more likely to suit those who have a mild addiction to smoking. In comparison, the argument for supporting abrupt cessation has the impulse toward skepticism. Gradual cessation has been deemed a more effective way to quit smoking because it takes the patient's withdrawal symptoms and complications into account. This scientific field still needs more solid evidence to verify the effectiveness of abrupt cessation, or future research can only focus on the improvement of the quitting strategy rather than making a simple or improved comparison between abrupt cessation and gradual cessation. Therefore, the point is not to compare abrupt cessation and gradual cessation but to make progress for both, as they can be used in a different situation.

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