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REVIEW

Behavioral Interventions Associated with Smoking Cessation in the Treatment of Tobacco Use

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Abstract: Tobacco smoke is the leading cause of preventable premature death worldwide. While the majority of smokers would like to stop, the habitual and addictive nature of smoking makes cessation difficult. Clinical guidelines suggest that smoking cessation interventions should include both behavioural support and pharmacotherapy (e.g. nicotine replacement therapy). This commentary paper focuses on the important role of behavioural interventions in encouraging and supporting smoking cessation attempts. Recent developments in the field are discussed, including 'cut-down to quit', the behaviour change techniques taxonomy (BCTT) and very brief advice (VBA) on smoking. The paper concludes with a discussion of the important role that health professionals can and should play in the delivery of smoking cessation interventions.

Keywords: smoking cessation, theories of behaviour change, behaviour change techniques, brief advice, behavioural counselling, cut down to quit, health professionals

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Introduction

Tobacco smoke is the leading cause of preventable premature mortality worldwide.[1] Despite 6 million deaths being linked to tobacco use on an annual basis, an estimated 1 billion people worldwide continue to smoke.[1] For every death related to smoking, 20 additional individuals will suffer from at least 1 serious smoking related illness.[1] Life expectancy and health-related quality of life indices have been shown to reduce in a dose-dependent manner when the number of cigarettes smoked increases.

Tobacco smoking is a learned behavior that results in a physical addiction to nicotine for the majority of smokers.[2,3] Accordingly, stopping smoking can be difficult for many individuals, and it is recommended that interventions include behavioral and pharmacological support.[4–6] Clinical guidelines suggest the use of pharmacotherapy such as nicotine replacement therapy (NRT), bupropion, and varenicline to assist patients with nicotine withdrawal.[4–6]

Seventy percent of smokers want and intend to stop smoking at some point, yet only 12% are ready to stop in the next month.[7,8] To date, smoking cessation interventions have typically been targeted at individuals who want to stop and are able to provide a firm commitment to quit on a "quit day." However, many smokers have tried unsuccessfully to quit this way. Recent evidence demonstrates that gradually reducing the number of cigarettes smoked before eventually quitting and quitting abruptly, with no prior reduction, produce comparable quit rates.[8,9] What is recommended, therefore, is that people who smoke be given the choice in terms of the approach.[9] As discussed, when seeking to quit abruptly, a combination of behavioral support and pharmacotherapy is recommended.[9–11] Reduction interventions can be carried out using self-help materials, aided by behavioral support, and include use of prequit NRT.[8,9]

Importantly, smoking cessation interventions (brief and intensive) have been shown to be an extremely cost-effective way of preserving life and reducing ill-health.[12] Costs per quality adjusted life year (QALY) for all smoking cessation interventions (brief and more intensive and those including pharmacotherapy) are low.[13] The QALY is a measure of disease burden including both the quality and quantity of life lived and is used in assessing the value for money of health care interventions.[12] Parrot et al[13] have shown that cost-effectiveness estimates (costs to the health care provider per discounted life year gained) are lowest for brief advice (£174); adding self-help materials and NRT brings this to £269. Brief advice, self-help materials, NRT, and specialist cessation services cost £255 per year gained. Although the cost increases as each of these components are added, the effectiveness of the intervention also increases. The addition of each of the components increases the total number of life years gained. In the United Kingdom, a QALY that costs less than £20,000 to £30,000 is considered to be cost-effective; therefore, smoking cessation interventions are considered to be highly cost-effective.[12] This commentary paper provides an overview of the important role of behavioral interventions in encouraging and supporting smoking cessation attempts. It also discusses some recent advances in the field and considers the role of the multidisciplinary team of health professionals who have contact with people who smoke.

How Does Behavioral Support Work?

Smoking cessation interventions are commonly influenced by theories of behavior change, including the Transtheoretical model (often referred to the stages of change model)[14] the Health Belief Model[15] and/or Social Cognitive/Learning theory.[16] Key aspects of the various models include a focus on the importance of motivation, self-efficacy, consideration of barriers and benefits to change, subjective norms, attitudes, and cues to action.[14–16] In recent years, West and colleagues have promoted the PRIME theory of motivation,[23,24] which they developed in response to what they perceived to be deficits in previous theories, particularly the Transtheoretical Model of Behavior Change.[15] In brief, PRIME theory considers cigarette addiction to be a disorder of motivation and it seeks, through a conceptualization of smokers' plans, responses, impulses, motives, and evaluations to help practitioners understand what they can do to help patients/clients overcome their addiction (a detailed account of PRIME theory can be found in West,[17] and McEwan and West.[18]

Linked to the above, behavioral interventions take the form of advice, discussion, encouragement, and other activities designed to help quit attempts succeed.[19] Interventions generally employ behavior change techniques, addressing factors such as

self-efficacy and motivation (often using motivational interviewing techniques).[20,21] Enhancing motivation is an important part of the overall treatment for tobacco addiction as it increases smokers' enthusiasm, sense of purpose, and will to quit.[22] Interventions may also seek to maximize self-regulatory capacity and skills (eg, strategies for reducing exposure to smoking cues) and include adjuvant activities such as giving advice on pharmacotherapy and encouraging social support (eg, among group members or from family).[20] Interventions should be tailored to individual need, where feasible.[20]

Behavioral change techniques for smoking cessation are complex and work in multiple ways, and this can make it difficult to tease out the most effective components.[19] There has been no improvement in the effectiveness of behavioral interventions over the past 20 years,[23,24] and it has been argued that a key reason is a lack of a shared language for describing the content, including the "active ingredients" of smoking cessation interventions.[19] This has limited the possibility of replicating effective interventions, synthesizing evidence and understanding the causal mechanisms underlying behavior change.[19] In an attempt to rectify this deficit, the UK Medical Research Council has recently funded the Behavior Change Techniques Taxonomy (BCTT) Project, the aim of which is to develop a reliable method for specifying behavior change techniques, linking them to relevant theory, and detailing the behaviors necessary to implement them.[25] Future research that uses the BCTT should help to inform the content and approach taken in interventions and improve the effectiveness of future behavioral support.[16]

While information and advice regarding the cessation of smoking remain relatively consistent across interventions, alternative modes of delivery have been developed to facilitate choice, uptake, and reach. The selection of a particular delivery mode may be related to an individual's preferences and/or availability and their ability to access the intervention.

Modes of Delivery

The most common and readily available interventions take the form of brief advice/interventions, individual behavioral counseling, group behavior therapy programs, telephone counseling, and self-help materials.

Brief advice/interventions

Brief advice on smoking cessation from a health care professional is effective in promoting cessation. This form of advice, particularly from general practitioners (GPs), leads 1 to 3 out of 100 smokers receiving it to stop smoking for at least 6 months.[26] This is in addition to the number who would have stopped anyway.[26] It is estimated that approximately 40% of smokers make some form of attempt to quit in response to advice from a GP.[26] This form of advice works primarily by triggering a cessation attempt.

The 5As approach, which is adopted in several countries worldwide, including the United Kingdom, the United States of America, and Australia,[5,6,9] provides health professionals who are not smoking cessation specialists with a useful framework for structuring brief smoking cessation advice/interventions.[27,28] The 5As approach assists initially in identifying smokers by encouraging health professionals to 'ask' patients/clients if they smoke/use tobacco. It then suggests that they 'assess' willingness to stop smoking, 'advise' on the importance of quitting, offer 'assistance' in the form of pharmacotherapy and/or referral for behavioral support, and 'arrange' a follow-up appointment, if possible, with those patients who wish to stop smoking.

While contact time between professionals and patients/clients in hospital, outpatient, and/or community settings is time-limited, brief opportunistic advice, such as that provided using the 5As approach is, as discussed above, known to be effective, and so efforts should be made to deliver this form of smoking cessation intervention whenever possible. However, despite evidence of effectiveness, the delivery of brief interventions is often suboptimal.[29] A number of barriers have been highlighted including the need for a more time-efficient method of delivery.[29,30] While brief interventions are said only to take 5 to 10 minutes, in certain time-limited consultations, professionals struggle to be able to dedicate this amount of time to conversations about smoking.

Developed in response to the concerns raised above, a new form of intervention, "very brief advice" (VBA) on smoking, is considered to have a greater level of utility when compared with the traditional 5As approach.[29] VBA on smoking is a simple, person/patient centered approach that professionals can deliver effectively in less than 60 seconds if time

pressures are such that this is required.[31] When using VBA, professionals are encouraged to ask patients about their smoking, acknowledging that they may have tried to stop many times in the past, and to discuss the options that exist to support a quit attempt, that is, behavioral support and pharmacotherapy.[32] Review-level evidence demonstrates that advizing people of the best way to stop and offering support and treatment, wherever it is available locally, are the most effective ways of generating quit attempts.[33] The key mechanism is the positive focus on offering assistance rather than the negative judgment that may be associated with advising people to stop (which they generally know they should do).[31] VBA, therefore, presents another useful tool in the smoking cessation armory of professionals.

Individual behavioral counseling

This type of counseling involves scheduled face-to-face appointments with a trained smoking cessation counselor. In addition to other behavior change techniques, motivational interviewing is generally incorporated into this form of behavioral intervention and is designed to enhance a person's impetus to change their behavior.[34] This patient-centered approach enhances an individual's motivation for change through self-examination and identification of ambivalence to change and the subsequent resolution leading to sustained positive behavior change. Usually sessions are weekly over a period of at least 4 weeks after a quit date, and this is normally combined with prescribed pharmacotherapy. Multiple and longer sessions appear to be more effective.[22] Individual behavioral counseling can also include advice regarding how to cut down to quit (ie, gradually reducing the number of cigarettes smoked before eventually quitting).[8]

Group behavior therapy

This form of therapy is offered to small groups of clients, and information, advice and, in most cases, behavioural intervention is provided.[24] Group support allows individuals to learn behavioral techniques, and group participants provide peer support.[24] Similar to individual counseling, group therapy is normally combined with pharmacotherapy. The chances of quitting are doubled for those who attend group behavioral programs compared with those who receive self-help material but no face-to-face behavioral support.[24] It is currently unclear whether groups are more effective than individual counseling.[24]

Telephone counseling

Telephone counseling and quitlines provide support and encouragement to individuals who smoke and want to quit or individuals who have recently quit. Increased frequency of calls by an individual to the quitline increases the likelihood of a person quitting in comparison with less intensive interventions such as self-help materials, brief advice, or pharmacotherapy alone.[35] Three or more calls have been shown to a have a greater benefit than 1 or 2 interactions. Those who have 1 or more additional phone calls after an initial contact increase their chance of quitting by 25% to 50%.[35]

This is an important access route for people who may be time poor or have access to limited financial resources.[36] Counseling using quitlines can be provided as part of a national, regional, or local health program or as part of a smoking cessation service and potentially can reach large numbers of people without medical referral.[35] As telephone smoking cessation counseling has been shown to be effective in clinical trials of the service, it has subsequently been integrated into routine health care provision in many countries.[36,37]

New technologies

With the advent of new technology, such as smart phones and easier Internet access, other types of intervention are available. The use of text messaging (eg, txt2stop and txt2Quit) has been developed using motivational messages with some success in the United Kingdom and the United States.[38,39] A Cochrane review of studies using mobile phones to provide support and motivation for smoking cessation has shown that although results have been variable, this type of intervention can be effective.[40] As technology advances, it is important that, similar to other forms of smoking cessation information, advice and support interventions delivered in this manner are evidence-based. Abroms et al[41] have shown that many new smart phone applications (apps) are not evidence-based.

Self-help materials

Self-help materials include manuals or structured programs that are used by individuals without the help of health professionals, trained counselors, or support groups. These are usually written materials

provided by health charities and government health departments with formats including leaflets, audio recordings, videos/DVDs, and Web/Internet-based materials. These self-help materials may be aimed at smokers in the general population or target particular populations such as those with long-term conditions or pregnant women. Current evidence suggests there is likely to be a small effect from the use of standard self-help materials on quit rates compared with no intervention.[42] Interestingly, there is no additional benefit to adding these materials to other interventions such as health professional advice or pharmacotherapy such as NRT[43]; however, a small benefit is seen when materials are tailored to individual smokers such as pregnant women or older smokers.[44]

Delivery of Smoking Cessation Interventions by Health Professionals

All health professionals have a role in delivering smoking cessation interventions to enable more people who smoke to quit and to remain smoke free. The US Public Health Service in 2008 found that interventions delivered by a variety of clinical health professionals were more effective than a single health discipline and nurse involvement in reinforcing other health professionals' smoking cessation advice is an important influence in helping smokers to quit.[9] Information and advice from nursing staff has been shown to increase patients' success in quitting, especially in hospital settings.[45] Similar advice given as part of health checks and prevention activities seem to be less effective but still may have some impact.[45] Dentists and other oral health professionals also have an ideal opportunity during dental health checks to ask about their patients' smoking status and provide smoking cessation information and advice.[46] While brief advice/interventions should be delivered by all professionals and therefore have a very wide reach, intensive support (individual, group, or telephone) is most effective when delivered by specialist advisors.[26]

Barriers and facilitators to the implementation of behavioral interventions

Unfortunately, despite strong evidence that the delivery of brief smoking cessation interventions is effective in encouraging cessation attempts, a number of studies have reported that delivery by health care professionals is often suboptimal.[28,33,47,48] The reasons are multiple but include time and service constraints,[47,48] concern about damaging relationships with patients,[28,33] and professionals not believing that smoking cessation interventions are effective.[28] Also, a key barrier is often that professionals have not had appropriate training and and/or lack confidence in their own ability to raise the issue of smoking cessation and provide appropriate information and advice.[28] Additionally, documentation is often poor regarding smoking status.[33] Therefore, to ensure that access to smoking cessation interventions is available and follow-up is undertaken, it is essential that smoking status is recorded in patients' health records in addition to information on advice, support, or referral provided. Finally, as noted above, while the 5As approach is commonly used, recent evidence suggests the VBA may be more appropriate in facilitating effective conversations about smoking in time-limited situations.[31,33]

Summary

Tobacco smoking remains a major contributor to premature mortality and significantly adds to the global burden of disease and disability. Brief advice/intervention using the 5As approach or very brief advice (VBA) is an essential first step in the chain of support known to be effective in assisting cessation. All professionals have a role in providing brief smoking cessation advice and education. Support to prepare for and during a quit attempt is best provided by health professionals with the appropriate knowledge and skills (some countries, such as the UK, have specially training cessation advisors). In combination, these different levels of support, combined with pharmacotherapy, significantly increase an individual's chance of managing to stop smoking successfully. Health care providers need to work with people who smoke to assist them in choosing the most helpful modality as a patient centered approach to smoking cessation.

Author Contributions

Conceived and designed the concept: NJR, SMK, SMSS. Wrote the first draft of the manuscript: NJR. Contributed to the writing of the manuscript: SMK,

SMSS. Agreed with the manuscript conclusions: NJR, SMK, SMSS. Jointly developed the structure and arguments: NJR, SMK, SMSS. Made critical revisions and approved final version: SMK, SMSS. All authors reviewed and approved the final manuscript.

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