Review Article

Smoking Cessation Support Services at Community Pharmacies in the UK: A Systematic Review

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Tobacco smoking is the number one preventable cause of death worldwide. Death rates documented in the UK have shown that more than 120,000 patients per year have died because of smoking.[1,2] Financially, the budget required in order to treat the diseases and the medical conditions developed as a result of tobacco smoking is calculated to cost the National Health System up to £1.7 billion per year.[1,2] As smoking is a modifiable risk factor for cardiovascular disease, early and total cessation could prevent morbidity and mortality. Smoking activates platelets and increases their adhesion, it causes malfunction or damage to the vascular endothelium, and it also increases the fluidity and levels of fibrinogen.[3] Smoking also causes atherosclerosis, leading to myocardial infarction, angina, sudden death, stroke, and intermittent claudication.[4,5] A number of studies have shown that legislation to ban smoking in of public places has led to a reduction in the incidence of myocardial infarction, especially among young people and non-smokers.[3]

Tobacco smokers face difficulties when they decide to discontinue, as the dependency on nicotine makes quitting hard without help and support. Smoking cessation services are services that encourage smokers to use a combination of pharmacological aids and psychological support in order to stop this habit more effectively. Educating smokers about the importance of not smoking is the first step in their long-term effort to give up the habit. This is why health care professionals, and more specifically pharmacists, should offer psychological support, help patients in their decision to quit smoking, inform them, and make sure that they understand the harmful effects of smoking, as well as the benefits of giving up. Once a patient has taken the important decision to quit smoking, there are three methods to help the implementation of that decision: nicotine replacement therapy (NRT), non-nicotine pharmacotherapy (Bupropion, Varenicline), and electronic cigarettes.[3-8] Smoking cessation services were found to be cost-effective,[8] but they necessitate approaches that could educate a large percentage of the general population. Community pharmacists and pharmacy personnel, who include pharmacy assistants, pharmacy technicians and trainees, could be the number one accessible option for patients who want to stop smoking.[3,6-7,9] In addition, published data have reported that pharmacists and pharmacy staff could play an active role in smoking cessation services, for example by providing education and counselling on the available NRT products (e.g.

patches), as well as suggesting lifestyle and behavioural changes.

The principal purpose of this literature review is to evaluate the existing accessible published data regarding the training, interventions, outcomes, and cost-effectiveness of pharmacy-led smoking cessation services within the UK. We performed a review and examination of the information contained in each study concerning ways in which pharmacy-led smoking cessation services can be enhanced in the future.

Materials and Methods

This literature review was conducted according to the regulations and recommendations of the Centre for Reviews and Dissemination's guidance for undertaking Systematic Reviews.[10]

Search approach

The study search was conducted between 9th October and 9th December, 2014, using the following electronic search engines: Science Direct, Google Scholar, Web of Knowledge, PubMed, NCBI, Scopus, and The Cochrane Library. These particular search engines were selected for the purpose of this review because of their comprehensive amount of available data related to the topic of preventative medicine and clinical pharmacy, as well as health sciences. The keywords used for the purpose of this review were as follows: preventative medicine, clinical pharmacy, smoking, England, Scotland, UK, smoking cessation, smoking cessation products, community pharmacies interventions, role of the pharmacists in smoking cessation, pharmacy staff and smoking, healthy living pharmacies, outcomes of smoking cessation services, cost-effectiveness, and smoking cessation services.

Study eligibility criteria

The selection criteria were based on the design of the study searched. This literature review included observational studies and randomised controlled trials referring to any smoking cessation service offered by pharmacists or any other member of staff within the community pharmacy setting. Furthermore, the selection criteria were based on studies that recruited smokers, covered the cost-effectiveness of the pharmacy services, and were related to quitting smoking as well as the interventions and the outcomes (total avoidance and regression).

Inclusion criteria

The inclusion criteria assigned had geographical and time limits, which meant that the studies evaluated data derived from the UK and were conducted between 1990 and 2014. In addition, the studies chosen in this paper were specifically related to smoking cessation services offered within community pharmacies. The use of the English language was also a set criterion.

Case studies chosen and data extraction approach

The inclusion and exclusion criteria were applied, and one assessor (AP) screened all suitable studies for the appropriate documentation. Key points of information were obtained from the studies. These included the study authors, year of publication, background of the study, the methodology proposed, the country of origin, the features of the participants and the main outcome.

Results

Literature search and study choice

Three hundred and two citations were acknowledged, of which 25 were duplicated and 92 were not appropriate. The flow chart in Figure 1 demonstrates the article assessment and the choice procedure. Articles were assessed through their abstracts, and 185 were excluded, leaving 37 full-text articles to be screened for appropriateness. Finally, six full-text articles met the criteria set.

Features of the selected studies

After the selection procedure, six studies were incorporated in this review, covering 6528 participants. This review evaluated two observational studies and four randomised controlled trials, all conducted in the UK. Additional information on the study features and strategy, number and characteristics of the participants, as well as the monitoring period, are shown in Table 1. Of the six studies comprising the review, two investigated the interventions and outcomes of smoking cessation services in the community pharmacy setting, one showed the cost-effectiveness outcomes of a pharmacy-led group smoking
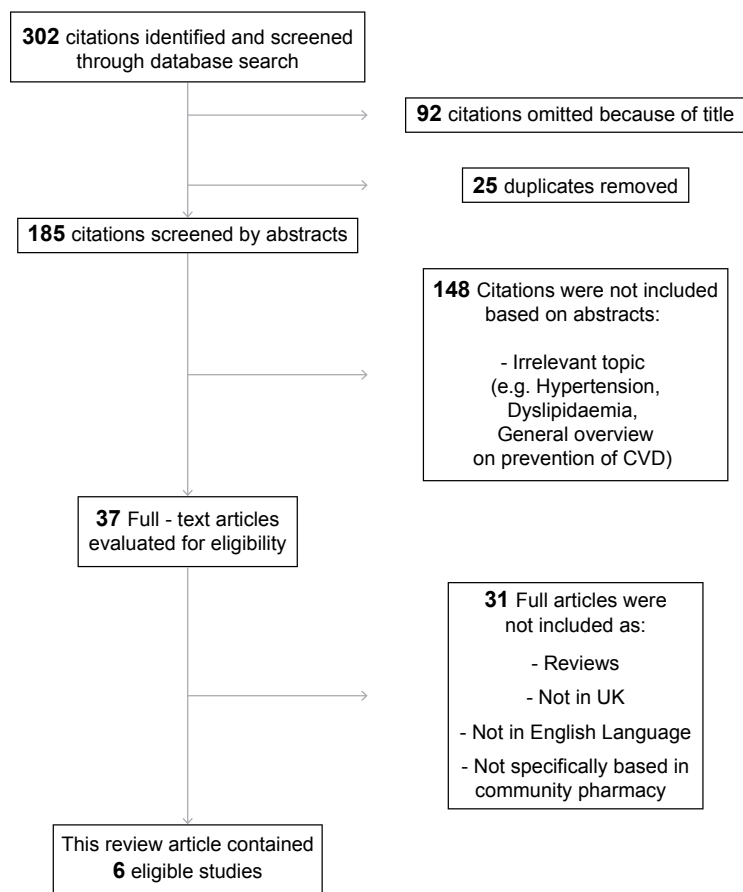
| **302** citations identified and screened through database search |
| **185** citations screened by abstracts |
| **37** Full - text articles evaluated for eligibility |
| This review article contained **6** eligible studies |

| **92** citations omitted because of title |
| **25** duplicates removed |
| **148** Citations were not included based on abstracts: - Irrelevant topic (e.g. Hypertension, Dyslipidaemia, General overview on prevention of CVD) |
| **31** Full articles were not included as: - Reviews - Not in UK - Not in English Language - Not specifically based in community pharmacy |

Figure 1. Flow chart demonstrating the assessments of articles included in this review.

Table 1. UK study features.

Authors	Year	Design	Participants	Characteristics of the sample	Monitoring period
Bauld et al.[16]	2011	Observational study	1785 smokers	-	52 weeks
Boyd et al.[15]	2009	Observational study	1979 smokers	Age range: 16 or above Female sample > Male No. of cigarettes daily: 21 or more > sample size than 20 or less (% valid value)	4 weeks
Bauld L et al.[11]	2009	Clinical controlled trial	1785 members of the public	Age range: 16 or above Male proportion: 41.5% No. of cigarettes daily: 21 or more (Represents: 40.6%)	4 weeks
Maguire et al.[12]	2001	Randomised controlled trial	484 patients	Age range: 18 or above Male proportion: 58.1% Not pregnant women No. of cigarettes daily: not a minimum no.	12 months
Sinclair et al.[13]	1998	Clusters Randomised controlled trial	492 patients	Age range: 17-77 Male proportion: 37% No. of cigarettes daily: 21 or more	9 months
Anderson et al.[14]	1995	Randomised controlled trial	40 pharmacies	A 21-year-old researcher visited 40 pharmacies divided into two groups. The research assessed: – How busy the pharmacy was – The willingness of the pharmacist to help – General satisfaction with the consultation and overall communication	5 days course

Table 2. UK study objectives, interventions and outcomes.

Author(s)	Objectives/ Interventions	Key Findings/Statistics		p
Bauld et al.[16]	Two groups set: • 1st group: one-to-one counselling with a pharmacist • 2nd group: group-based support	CO-validated quitters consolidated drop in CO levels from 22.5% at 4 weeks monitoring period to 3.6% at 52 weeks of the first quitting date. 1st group: 2.8% cessation rates 2nd group: 6.3% Cost effectiveness per group: Probability of quitting: 1st group: 0.0025 and 2nd group: 0.055 Cost per client: 1st group: £79, 2nd group: £368 1st group: an incremental cost per QALY of £2600 2nd group cost per QALY: £4800		<0.001
Boyd et al.[15]	Two groups set: • 1st group: Pharmacy-based therapy • 2nd group: Group therapy	Cost effectiveness: 1st group: Cost per participant: £53.31 (probability to quit: 0.17) 2nd group: Cost per participant: £338.54 (probability to quit: 0.31)		NA*
Bauld et al.[11]	Two groups set: • 1st group: Pharmacy-based service • 2nd group: Group therapy	CO-validated quitters (CO range 1-10 ppm.): 1st group: 18.6% 2nd group: 35.5% Self-reported quitters: 1st group: 9.2% 2nd group: 5.8%		<0.0005
Maguire et al.[12]	Two groups: • 1st group: Pharmacy-based smoking cessation (PAS) • 2nd group: as control	Non-stop continuous abstention of smoking:		
		3 months	PAS group:27.5% Control group:11%	
		6 months	PAS group:18.5% Control group:8.2%	<0.001
		12 months (cotinine <50 ng/mL)	PAS group:14.3% Control group:2.7%	
Sinclair et al.[13]	Two groups: • 1st group: Trained pharmacists and pharmacy assistants • 2nd group: as control	Smoking cessation acceptance:		
		1 month	1st group: 29.9% 2nd group: 23.6%	0.12
		4 months of quitting	1st group: 16.1% 2nd group: 10.9%	0.094
		9 months of quitting	1st group: 12.0% 2nd group: 7.4%	0.089
Anderson et al.[14]	Two groups: • 1st group: 20 random Barnet pharmacists, who participated in a training session. • 2nd group: contained 20 untrained pharmacists	Time spent:	1st group: 5.3 min (SD 4.7) 2nd group: 2.45 min (1.3)	<0.02
		Questions asked:	1st group: 20 2nd group: 16 χ^2=3.956 (df=1)	<0.05
		Referral to doctor:	1st group > 2nd group χ^2=3.956 (df=1)	<0.05
		Unwillingness to help:	1st group: 1 pharmacist 2nd group: 5 pharmacists	<0.05

*NA – not available.
QALY – quality-adjusted life year.

cessation service versus a control group, one evaluated both the interventions and the cost-effectiveness mechanisms of the services, and two analysed the training offered for pharmacists and pharmacy staff.

Evaluation of training interventions and outcomes of smoking cessation services delivered by community pharmacies

Bauld et al[11] defined two groups using a Maudsley model. The first group included pharmacy-based services with one-to-one support once a week, which lasted between 5 and 15 minutes depending on the individual, combined with NRT supply. The second group, which involved group support, offered behavioural support and education as well as 60-minute counselling by a specialist, in combination with NRT, bupropion or varenicline. The duration of the services provided to each group was 7 weeks and 12 weeks, respectively (Table 2). The study established that there was a statistically significant difference in the abstinence rate at 4 weeks (p<0.0005) between carbon monoxide (CO)-validated and self-reported quitters. In this comparison, smokers who quit by themselves and those with CO greater than 10 ppm were excluded.

Maguire et al[12] compared two groups. The pharmacy-based smoking cessation service (Pharmacists' Action on Smoking; PAS) and a second group, which acted as a control. In the PAS group, the pharmacist had an introductory one-to-one interview with a patient, which lasted between 10 and 30 minutes, presenting the PAS chart and leaflets, and setting a weekly monitoring plan for a total of 4 weeks, then once a month for 3 months. NRT was not always offered. The control group was offered typical services, i.e. the pharmacists dispensed smoking cessation treatment without any consultation. The results showed that 27.5% of the clients who used the pharmacy-led service managed to refrain from smoking for the whole period, whereas only 11% of the clients who participated in the control group maintained their abstinence. The duration of abstinence for both groups was 3 months. Furthermore, the prevalence of abstinence in both groups during a 6-month period was 18.5% for the pharmacy-led group and 8.2% for the control group. At 12 months, the percentage of urinary cotinine-validated continuous abstinence was 14.3% in the pharmacy-led group and 2.7% in the control group (p<0.001).

A study by Sinclair et al[13] had two groups, the first of which consisted of trained pharmacists and pharmacy assistants who provided the pharmacy support programme, including enrolment in the advice service and record-keeping, while the second group, which was the control, were offered essential services such as dispensing of NRT. The results of both groups for self-reported abstinence were obtained after 1 month, 4 months, and 9 months. The results established that in the first month, the pharmacy support program group (requiring enrolment, advice-counselling and record-keeping) reached 29.9% abstinence whereas the control group had 23.6% abstinence (p=0.12). After 4 months, the results showed that the pharmacy support program achieved abstinence for 16.1% of the participants, compared to 10.9% for the control group (p=0.094). Finally 12.0% of the pharmacy led group and 7.4% of the control group (p=0.089) achieved abstinence for the 9-month period. Although the pharmacy-led group showed higher abstinence, this was not statistically significant.

Anderson et al[14] evaluated two groups. The first group contained 20 random pharmacies in the London borough of Barnet. The Barnet pharmacists were trained by attending a five-day session, including a two-day course that covered techniques for personal interaction and promotion of public health, as well as the communication expertise needed to put over the health education message, and a one-day continuous course. An active pharmacist working in the community setting and a psychologist taught the course. During the five day courses Barnet pharmacists had the opportunity to learn about diabetes, coronary heart disease, nutrition, etc. In general, the course stimulated participation and was based on competence and knowledge acquired through a communication process. The second group included 20 untrained pharmacists. In both groups the researcher, who was the customer, asked for information about available patches for quitting smoking. The results showed that the time spent by each group on assessing the customer (researcher) was dependent on training. Thus, the mean time spent was 5.3 minutes for the first group and 2.45 minutes for the second group (p<0.02). This significant difference arose from the fact that Barnet pharmacists, who had already trained in order to offer the smoking cessation service, took more time to assess the patient. Furthermore, regarding the questions that both groups were asked, the results showed that 20 (all) Barnet pharmacists and 16 out of 20 untrained pharmacists first asked about the quantity of cigarettes that the researcher smoked per day (p<0.05). Referral to a doctor is another important element of smoking cessation services, as each individual has to be treated differently. In this study the researcher declared that she was diabetic – referral is compulsory when a diabetic patient wants to quit

smoking. Results established that a larger percentage of Barnet pharmacists referred the customer (researcher) to a doctor compared to control pharmacists (p<0.05). The study pointed out that there was no difference between the groups regarding how busy the pharmacies were. Nevertheless, only one Barnet pharmacist was reluctant to counsel the customer (researcher) compared with five pharmacists from the control group (p<0.05).[14]

Evaluation of cost-effectiveness outcomes of smoking cessation services

Boyd et al[15] defined two groups using a Maudsley model. The first group received a pharmacy-based service with one-to-one support once a week combined with a supply of NRT. The second group underwent group therapy in the community, rather than in pharmacies, in combination with smoking cessation medication. The individual pharmacy-led service demonstrated better results in terms of the number of clients who stopped smoking compared to group services run in the community. The outcomes, which were applicable to the cost-effectiveness analysis, were based on the original sample of participants and the quitters who were CO-validated at 4 weeks after quitting. The pharmacy-led group had 255 quitters, whereas the group service led by a specialist involved 146 quitters. The authors also estimated the probability of stopping smoking within a period of four weeks as an outcome of this study. The probability for the pharmacy-led group was 0.17 whereas for the group-based service it was 0.31. Reviewing the results related to the probability of quitting smoking for each group, the group-based service had the highest probability of cessation success in four weeks, but at the same time proved to be the more expensive intervention, as the cost per client was £338.54 compared to £53.31. Overall, the pharmacy-led service required an incremental cost of £772 per quitter for the four-week programme, while the group-based service required a supplementary cessation cost of £1612.

Evaluation of both cost-effectiveness and clinical outcomes of smoking cessation services

Another study by Bauld et al[16] included two groups, building on their intervention based on the Maudsley model, in order to determine the outcomes and the cost-effectiveness of pharmacy-based smoking cessation services. The aim of this study was to test the quit

rates and the cost-effectiveness of the behavioural support in both groups who were offered the service. The first group had one- to-one counselling with a pharmacist and the second received group-based support. The duration of the programme was 12 and 7 weeks, respectively. Both groups were compared with the self-quit rate. Generally speaking, CO-validated quitters consolidated a drop in CO levels from 22.5% at 4 weeks to 3.6% at 52 weeks after the quit date. The first group achieved 2.8% cessation rates whereas the second group achieved 6.3% (p<0.001). Concerning the financial effectiveness in both groups, the results suggested that the first group had a cost per client of £79.20, compared to £368 in the second group. The pharmacy-led service required a further cost of £7800 for the 52-week quitting programme; however, the group-based service required a supplementary quitter cost of £9200. The probability of quitting smoking was 0.025 in the first group and 0.055 in the second group, compared with 0.015 in the "self-quit" group. Finally, the pharmacy-led service had an incremental cost per quality-adjusted life year of £2600, compared with £4800 for the group-based service.

Study quality evaluation

This review assessed a total of 6 studies, which included two observational studies and four randomised controlled trials. After evaluating the studies included in this report, it is worth mentioning that the study of Sinclair et al[13] was the only one that proposed calculating sample sizes; however, it is not clear whether the methods proposed were actually considered. Furthermore, there is no obvious evidence that most of the studies included had the capacity to compare and contrast the groups with each other. However, it must be acknowledged that one of the six studies covered (Maguire et al[12]) had a large number of participants. Only Anderson et al[14] used blinding in the study. This meant that the researcher/customer did not know which pharmacists had participated in the 5-day training course before offering the smoking cessation service. The other studies included did not use blinding in their methods, because the intervention made its use difficult.

Comparing the studies included, Maguire et al,[12] Sinclair et al,[13] and Anderson et al[14] trained the pharmacists and pharmacy personnel who managed the interventions before offering the services. Maguire et al[12] stated that full instructions, advice and pro-

posals were provided to pharmacists and pharmacy staff concerning smoking cessation in order to educate them and to help them to be ready to offer the intervention. Subsequently, they organised workshops for them, of three hours' duration, in order to teach them about smoking cessation guidelines in addition to the experimental procedure of the study. These workshops were run by specialists and took place 2-3 weeks after the distribution of instructions through a written proposal. Statistical analysis of smoking, prevalence, NRT products, as well as instructions regarding the application and the explanation of the PAS model, were some of the topics covered in the workshop. All pharmacists and pharmacy staff had support and the opportunity to ask any questions regarding the PAS model. Sinclair et al[13] trained pharmacists and pharmacy staff in a 2-hour tutorial. This session informed them about the steps of modification with regard to smoking cessation and communication services for assigning change and delivering continuous assistance. The study by Anderson et al[14] included two training sessions (five days in total). A session was run for two days, which included education with reference to communication abilities, and key points on how to promote health, presented by an active pharmacist working in the community setting. The second part of the training comprised a continuous program of one-day sessions on particular subjects taught by a psychologist.

Finally, only in the study by Maguire et al[12] were information and instructions provided pertaining to the services offered. None of the studies mentioned supervision of any person who provided the intervention, nor was there any information regarding corroboration of the intervention technique.

Discussion

A review of all the results mentioned above shows that Bauld et al[11] and Sinclair et al[13] found significant results for abstinence from smoking over a period of six months, whereas after that period the results showed no significant difference (e.g. after nine months). Furthermore, all studies included in this review used the same methodology. More specifically, they compared a pharmacy-led service to a control.

Certain studies covered in the review stated the hypothesis set, although behaviour change techniques were not defined. Bauld et al[8] did not state the hypothesis of behavioural change techniques in the actions conducted. Although Maguire et al[12] mentioned

that the intervention was based on PAS, no more details of behavioural modification were included. Sinclair et al[13] educated pharmacists and pharmacy staff in the steps of modification so as to allow them to evaluate clients' progress and give personalised support to the clients' existing status. Nevertheless, the methods of the behavioural modification achieved did not take into account the modifications in the behaviour of the clients when being advised by the pharmacists and pharmacy staff.

After six months of monitoring, results have shown the valuable impact of pharmacists and pharmacy staff contributing to smoking cessation services. Pharmacists as healthcare professionals and the pharmacy personnel had the ability to offer counselling, education and behavioural support to patients who wished to quit smoking.[12] Most of the studies covered in this review operated multifaceted interventions including various mechanisms. Bauld et al[11] assessed the services in terms of their content and methodology, using one-to-one interviews in comparison with group treatment.

In the studies included in this review, different comparison procedures were conducted. The study by Bauld et al[11] included active treatments. It compared non-medication approaches with the total number of patients taking NRT. A barrier that may have to be overcome is that the routine collection of data is important for checking and assessing smoking cessation programmes; however, Maguire et al[12] stated that there is a lack of record keeping in monitoring period measures.

Regarding the encouragement of abstinence from smoking, Bauld et al,[11] Maguire et al,[12] and Sinclair et al[13] mentioned that most of the participants who wanted to stop smoking, either by proposing a quit date or attempting to quit, were looking for help from smoking cessation medications. Furthermore, Sinclair et al[13] stated that pharmacy staff's lack of time of affected patients' compliance regarding the pharmacy-led service, which caused non-attendance at the service.

Although pharmacy-led services showed positive results for smoking cessation, in reality there was a lack of time for all contributors (either participants or pharmacists-pharmacy staff), as clarified by Maguire et al[12] and Sinclair et al.[13] In addition, a remuneration issue covering the smoking cessation programs was raised as a large obstacle for pharmacists in order to successfully offer the smoking cessation services, as identified by both Maguire et al[12] and Ander-

son et al.[14] According to these studies, pharmacists were not very eager to offer further advice regarding smoking cessation, with the exception of medication, as they were not paid for the extra work related to this service. An additional problem is the absence of training, which leads to a lack of self-confidence, thus causing problems in communication with patients and reducing the quality of the services offered.[12] Although training in offering a smoking cessation service has been provided for pharmacists since 1995, there is still a need for more scheduled sessions with specialists, such as psychotherapists or specialised pharmacists. As stated in the report of Anderson et al,[14] pharmacists mainly gave advice to patients regarding medication for smoking cessation. However, in the studies reviewed, pharmacists not only offered advice on medication, but also delivered initial counselling to each individual in order to understand their needs. Maguire et al[12] also emphasised that the relationship between pharmacists and physicians needs improvement, as this is a barrier that affects the delivery of smoking cessation services. They concluded that patient care should not be affected by the lack of effective communication between GPs and pharmacists. Hence, healthcare professionals should work as a team for the benefit of the patient.

Cost effectiveness analysis of the studies carried out by Boyd et al[15] and Bauld et al[16] showed that both pharmacy-led services and group services were financially cost-effective, even though they had a low cessation rate at one year. A pharmacy-led service achieved lower cessation rates compared to the group service, whereas group services were more expensive than pharmacy-led services. On the whole, clients had better results at four weeks but some patients' relapsed, leading to a lower abstinence rate after one year. Based on the results, it is important to increase the number of smokers who use the smoking cessation pharmacy-led service, as it is cost-effective. Furthermore, the pharmacy offers patients education, counselling, and behavioural change that is easily accessible. Finally, since an important factor leading to the relapse of smoking is stress, pharmacists are able to support patients in order to improve their quality of life and to encourage ongoing cessation.[12-14]

Conclusion

Health care professionals such as pharmacists can run effective smoking cessation services, leading to a decreased level of morbidity and premature mortality associated with smoking-related chronic diseases, as well as an augmentation of work productivity. In spite of smoking cessation services being the "gold standard" concerning cardiovascular disease prevention, they are not routinely offered by pharmacists and other health care professionals, as the training is still inadequate. In order to increase the success rates of pharmacy-led smoking cessation services, education and routine training for all pharmacy personnel is essential. Furthermore, it is imperative to consider the time constraints of the pharmacy personnel, as well as adequate reimbursement, to facilitate service provision. Results have shown that pharmacists, as primary healthcare professionals, are able to offer advice, help and support for smoking cessation with a higher success rate compared to self-quitting. The cost is relatively high, but at the same time such programmes are effective, using both pharmacy-led and group-led services. However, the pharmacy-led service is less expensive than group-based ones. It is thus imperative to try to increase both pharmacists' and patients' awareness of pharmacy-led smoking cessation services, and to ensure that these services become routinely offered in the community pharmacy setting.

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