Implementation and evaluation of a smoking cessation group session program

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Summary

Introduction: Prevalence rates for tobacco use in Russia are among the highest in the world. At the same time tobacco control is a low priority in the country. In particular, the effect of addiction on users is underestimated and very little assistance is provided in the country, particularly from the state public health service, for smokers to stop smoking. Our aim was to create, implement and evaluate an effective smoking cessation service.

Design and measurements: We developed a smoking cessation group session (SCS), which consisted of a lecture by a specialist, examination with a carbon-monoxide detector, exchange of personal experiences and discussions about issues related to smoking cessation including pharmacotherapy. All smokers completed a questionnaire prior to beginning SCS to measure social, psychological and behavioral factors in order to assess possible determinants of SCS efficacy. Attempts were made to follow up all participants.

Results: Over 1400 smokers ages 18—74 years participated in SCS over a period of 2 years. The majority of smokers, 73% of men and 56% of women were highly tobacco dependent ($\geqslant 5$ points on the Fagerstrom test). Follow up was unavailable for 29% of the participants. Of those with follow up, 41% stopped smoking for some period of time and 18% reduced their daily consumption of cigarettes by at least 25% of their pre-treatment level. No attempt at smoking cessation was made by 31% of all smokers after their participation in SCS. A large proportion of smokers, even after participation in SCS, were not sufficiently motivated and ready to stop smoking. Past quit attempts, number of cigarettes smoked per day, level of tobacco dependence, and the degree of motivation were associated with abstinence.

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Conclusions: SCS is an effective model of smoking cessation assistance particularly for those motivated to quit. It should be used in most public health settings and thus integrated into the national health care system in Russia. Further research should address cost-effective ways of enhancing the impact of this program.

Introduction

Smoking cessation is an important component of a comprehensive tobacco control policy. The Framework Convention on Tobacco Control sets out general obligations to implement effective programs and services for treating tobacco dependence [1]. A 2000 report by the US Surgeon General emphasizes that smoking cessation is one of the most cost-effective of all health care treatments [2]. Interventions to help smokers quit are particularly required in Russia.

The prevalence of tobacco use in Russia is one of the highest in the world, with 63% of men and 10% of women being current smokers [3] and tobacco consumption is increasing by 1.5—2.0% per year [4]. There is a noticeable increase in the prevalence of smoking among young Russian women. In Moscow the percent of smoking women ages 20—29 years increased from 10% in 1985 to 30% in 2000 [5]. The impact to the country is enormous: 30% of total male deaths and 4% of total female deaths in Russia are attributable to smoking [6]. Among men, the fraction of smoking attributable mortality is one of the highest in the world [7].

At the same time, our population survey shows that in the age group 30—50 years, the proportion of ex-smokers is only about 10%, but the proportion of current smokers willing to quit is over 60% [8]. Tobacco dependence was recognized long ago as being a chronic relapsing disorder and the majority of smokers need smoking cessation assistance to stop smoking. In spite of a great need and demand for smoking cessation assistance, such help is unavailable from the state public health service. This should be given high priority within the next few years in order to reduce the burden of tobacco-related diseases. Smoking is an important preventable cause of morbidity and mortality [2]. Evaluation of the effectiveness of extensive cessation programs in the Russian Federation showed that they could reduce risk for early mortality and increase life expectancy by an average of three years [9]. In spite of the stated potential benefits, tobacco control remains a very low priority in the country. In particular, the effect of addiction on users is underestimated and very little is provided in the country for those smokers who need assistance with cessation.

Health professionals, particularly physicians are perceived as the most valuable, credible and reliable source of smoking cessation help [10]. However there are two main obstacles for widespread physician-assisted intervention in Russia at the present time. First, the prevalence of smoking among Russian physicians is the same as in the general population and the majority of them could not model non-smoking behavior. Second, demands on a physician's time reduce the number of smokers who can receive smoking cessation assistance. Consequently, very few health professionals offer cessation counseling [11]. The public health challenge is to deliver high-quality smoking cessation services to large numbers of smokers at a low cost.

Methods

A group session approach was chosen as the most affordable and effective method for smoking cessation assistance. The evidence suggests that individual and group support have an approximately similar effectiveness [12—14]. Our smoking cessation group session (SCS) program consisted of a lecture by a specialist, exchange of personal experiences and discussions about issues related to smoking cessation including pharmacotherapy. A breath CO reading was taken during the session using a carbon-monoxide detector. SCS was provided to increase motivation, offer a sense of control and develop skills and techniques for smoking cessation. At the conclusion of the SCS, the participants were invited to visit or to call the service if they had any other questions or problems. The length of the SCS was about 1.5 h with about 10 smokers in each group. The SCS were conducted free of charge by trained medical professionals with experience in clinical psychology and smoking cessation therapy. The staff typically worked 2 SCS per week, which were conducted in the Department of Prevention of the Russian Cancer Research Center.

An informational advertisement campaign offering a free smoking cessation service was organized periodically during the two years of the study. The service was promoted primarily through local media (Moscow broadcasting station, local newspapers and a local TV channel) free of charge as well as

by health service providers, including general practitioners and other medical professionals in 10 Moscow out-patient clinics located near the smoking cessation service. Special meetings and seminars had been conducted for the physicians to encourage them to offer referrals to all their patients who were smokers. Promotion of the service became limited because of a lack of funds and our inability to accept more referrals or callers. The following categories of callers were not eligible for recruitment: callers who had already quit, those (not smokers themselves) calling on behalf of others, those displaying obvious signs of a psychological or intellectual disability, and those under 18 years of age.

Prior to attending the SCS, smokers were asked to provide baseline data by completing a detailed self-administered questionnaire, which identified demographic characteristics, smoking behavior and other factors including past quit experiences, general health status and complaints, level of nicotine dependence, and motivational readiness to quit smoking. Tobacco dependence was measured by the Fagerstrom test [15] and motivation to quit smoking by a test developed at the Russian Cancer Research Center [16]. This test consists of 5 questions with a choice of responses and a scoring system for a quantitative estimation of the degree of motivation or readiness to quit smoking.

All recruited smokers were contacted for follow-up after participating in the SCS, either in person or by telephone. They were invited to return for a follow-up assessment during the first 1—3 weeks after attempting to stop smoking. For those who did not attend in person, self-reported data were obtained by phone at 1, 3, 6 and 12 months post-session. Participants with questionnaires that were not returned or that contained incorrect answers for more than half of the questions were excluded from the analyses. All collected data were submitted to univariate and multivariate analyses. Descriptive statistics were used to characterize the sample. Univariate analyses included χ^2 tests for nominal or dichotomous data and t tests for continuous normally distributed data. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated to evaluate the association between possible determinants of SCS efficacy and the results of smoking cessation assistance.

Results

More than 1500 smokers participated in SCS but only 1430 returned a satisfactory questionnaire. The age range of the smokers was 18—74 years.

Table 1 Age and sex distribution of 1430 smokers participating in SCS

Age	N (%)	Proportion of smokers by gender	
		Male	Female
<20	49 (3%)	24 (3%)	25 (4%)
20—29	206 (14%)	103 (12%)	103 (18%)
30—39	222 (16%)	122 (14%)	100 (17%)
40—49	268 (19%)	156 (18%)	112 (19%)
50—59	358 (25%)	202 (24%)	156 (27%)
60—69	263 (18%)	192 (23%)	71 (12%)
>70	64 (5%)	48 (6%)	16 (3%)
All	1430 (100%)	847 (100%)	583 (100%)

All were Moscow residents. Table 1 shows the age and gender structure of this cohort. The majority, 67%, were over 40 years of age, and only 17% were under 30 years. It appears that middle aged and older smokers are more motivated to stop, perhaps because of the appearance of health consequences of smoking.

The proportions of men and women in the study cohort were 59% and 41%, respectively. It should be noted that the male and female distribution among participating smokers is quite different from that among all smokers in the Moscow population — approximately 80% and 20%. These data demonstrate that women who smoke may be more motivated to quit smoking than men.

Smoking behavior data

Smoking status of all the smokers was defined by a self-administered questionnaire, which was completed prior to starting SCS. Table 2 shows the age of onset of regular smoking. Onset of smoking prior to age 15 was reported by 10% of women and 23% of men. However among women over 49 years of age, only 1% began regular smoking before 15 years of age; among women under 30 years it was 33%. Similarly though less dramatic findings were observed for men with 21% over 49 years of age and 41% under 30 years having begun smoking prior to age 15 years. These data confirm that the age of onset of regular smoking has become noticeably lower with the younger generation compared to the older generation. Only 3% of male smokers but 13% of female smokers began regular smoking after age 29 years. A significant proportion of women begin regular smoking at a relatively late age.

The majority of smokers in the study cohort (73% of men and 56% of women) smoked 20 years or more. Only 6% of women and 3% of men smoked

Table 2 Age of onset of regular smoking

Gender	Current age	N	Age of onset of regular smoking				
			<15	15—19	20—24	25—29	>29
Women	<30	128	42 (33%)	77 (60%)	8 (6%)	1 (1%)	—
	30—49	214	13 (6%)	109 (51%)	61 (29%)	20 (9%)	11 (5%)
	>49	243	3 (1%)	55 (23%)	76 (31%)	42 (17%)	67 (28%)
	All	585	58 (10%)	241 (41%)	145 (25%)	63 (11%)	78 (13%)
Men	<30	127	52 (41%)	70 (55%)	5 (4%)	—	—
	30—49	278	49 (18%)	171 (61%)	43 (15%)	14 (5%)	1 (0.5%)
	>49	442	91 (21%)	201 (46%)	102 (23%)	24 (5%)	24 (5%)
	All	847	192 (23%)	442 (52%)	150 (18%)	38 (4%)	25 (3%)

Table 3 Awareness of any personal harm from smoking

	Women (444)			Men (650)		
Age	<30	30—49	>49	<30	30—49	>49
Do you feel any harm from your smoking?						
Yes	69 (78%)	142 (88%)	165 (86%)	62 (71%)	171 (80%)	287 (82%)
Sometimes	13 (14%)	17 (10%)	19 (10%)	19 (22%)	35 (17%)	55 (16%)
No	7 (8%)	4 (2%)	8 (4%)	6 (7%)	7 (3%)	8 (2%)

for less than 5 years. The proportion of heavy smokers (>20 cigarettes per day) was much higher among men than women, 35% and 15%, respectively ($p < 0.001$). Tobacco dependency was high ($\geqslant 5$ points on the Fagerstrom test) in the majority of smokers (60% of women and 76% of men). Even in the younger age group, under 30 years, 58% of women and 70% men were highly tobacco dependent.

Among the 1430 smokers only 8% (112) had never tried to quit smoking. While the overwhelming majority had tried to quit at some time in the past, 52% (745) reported no measurable success, 10% (144) succeeded only in reducing the number of cigarettes smoked and 30% (429) succeeded in quitting for some period of time.

Table 3 presents data regarding awareness of any personal harm from smoking. The majority (about 80%) of smokers almost independently of age and sex answered that they feel some harm from their smoking, with slightly more, older smokers answering thus.

Evaluation of outcome of SCS

In total more than 1500 smokers participated in SCS between November 2002 and November 2004. Of these, 1430 completed a baseline questionnaire and were followed either through repeated visits to the service and/or telephone contacts. We were unable to achieve contact with 29% (419) of the smokers. Only 128 subjects or 9% of all recruited smokers made a follow-up visit. There are two main reasons why on site follow-up was so poor. First, we were forced to change the location of the smoking cessation service. Second, we accepted smokers from the entire Moscow region so it was difficult for some to travel great distances to attend follow-up visits. If any smoker failed to attend a follow-up meeting his/her smoking status was ascertained by telephone. Therefore, long-term smoking status and cessation outcomes were validated for only a minority of subjects for whom we used a portable carbon-monoxide analyser. For the majority of subjects, self-reported data were obtained by phone at 1, 3, 6 and 12 months post-session. Follow-up was not uniform for all participants. More than 1 month of follow-up was achieved for 1013 (100%); more than 3 months for 834 (88%); more than 6 months for 578 (41%) and more than 12 months for 281 (20%).

Table 4 shows the outcomes of smoking cessation assistance through SCS. The majority of smokers who participated in SCS achieved some result: 42% of men and 42% of women stopped smoking for some period of time and 20% of men and 17% of women reduced their daily consumption of cigarettes by at least 25% of pre-treatment levels. An attempt to stop smoking was made by 9% of men and 14% of women without success, while 29% of male smokers and 27% of female smokers did not

Table 4   Outcome of smoking cessation assistance

Gender	N	No attempt	Attempt without success	Outcome following a quit attempt				
				Cut down	Quit for <1 month	Quit for 1—6 months	Quit for 7—12 months	Quit for >12 months
Men	635	183 (29%)	58 (9%)	127 — 20%	101 — 16%	107 — 17%	32 — 5%	27 — 4%
Women	462	124 (27%)	66 (14%)	80 — 17%	78 — 17%	76 — 16%	20 — 5%	18 — 4%

even make an active quit attempt. All smokers in the last group were asked why they did not try to quit. Most often explanations included:

- a postponement to attempt to quit for a future date;
- lack of belief in the efficacy of the smoking cessation assistance that was offered;
- a change in the personal decision to quit smoking.

Thus a significant proportion of smokers, even after participating in SCS were not sufficiently motivated to stop smoking.

More valuable are the data presented in Table 5 on subjects >12 months follow-up after SCS. These data show that among this group of subjects, the quit rate at 1-year of follow-up was 18% for men and 13% for women. A more positive effect of SCS should be pointed out. The follow-up interviews of smokers, who were not able to quit or who relapsed, revealed that about 95% of them remained motivated to quit smoking and many of them repeated their attempt to quit, in general, with more success.

Determinants of SCS efficacy

Analyses were undertaken to identify factors associated with successful cessation and maintenance or relapse. Table 6 shows the results of SCS assistance depending on smokers' past quit experience. There were 467 smokers who were able to stop smoking for 1 week or more after smoking cessation assistance and 643 smokers, who were unable to stop smoking after the SCS assistance. Relative risks were estimated using exposure odds ratios from cross-tabulations and logistic regression. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated to evaluate the association between past quitting experience and results of smoking cessation assistance and are presented in Table 6. The results confirm that a previous quit attempt was associated with a better outcome. The probability of quitting smoking after participating in SCS was 4 times as great among those who quit for some period of time in the past as among those without any quit experience (OR = 4.06; 95% CI 2.29—7.21). Thus a past quit experience with at least some success significantly

Table 5   Outcome of smoking cessation assistance among 281 subjects with >12 months follow-up

Gender	N	No attempt	Outcome following a quit attempt					
			No success	Cut down	Quit for <1 month	Quit for 1—6 months	Quit for 7—12 months	Quit for >12 months
Male	148	33 (22%)	23 (16%)	21 (14%)	16 (11%)	20 (13%)	9 (6%)	26 (18%)
Female	133	23 (17%)	23 (17%)	15 (11%)	20 (15%)	26 (20%)	9 (7%)	17 (13%)

Table 6   Association between past quit experience and the outcome of SCS assistance (N = 1110)

Past quit experience	Number of smokers who		OR	(95% CI)
	Stopped smoking for >1 week (n = 467)	Could not quit (n = 643)		
No attempt to quit in the past	17	67	1.00	Reference
Unsuccessful past attempt(s)	232	352	2.60	(1.48—4.56)
Reduced number of cigarettes	50	61	3.23	(1.67—6.26)
Quit for some period of time	168	163	4.06	(2.29—7.21)

increased the probability of quitting during the last attempt.

Table 7 shows the results of SCS assistance depending on the number of cigarettes smoked per day. It appears that those who smoked more than 30 cigarettes per day were significantly less likely to stop smoking for 1 week or more than those smoking fewer than 11 cigarettes per day (OR = 0.6; 95% CI 0.35—1.03).

Table 8 shows the results of SCS assistance depending on the number of years of regular smoking. The OR for quitting depended on an increase in the number of years of regular smoking, however this was not statistically significant.

Table 9 presents the results of SCS assistance depending on the level of tobacco dependence as measured by the Fagerstrom test. The probability of quitting was inversely related to the Fagerstrom test score but was not statistically significant. At the same time when the duration of abstinence was taken into consideration, it appeared that a

significantly greater percentage of smokers with low tobacco dependency (Fagerstrom score 1—4) was able to quit for more than 1 month in comparison with highly dependent smokers (Fagerstrom score >7). The corresponding percents were 30% and 19% among men ($p < 0.05$) and 29% and 11% among women ($p < 0.001$).

Table 10 presents the results of smoking cessation assistance depending on the degree of motivation to quit as measured by a questionnaire, developed at the Russian Cancer Research Center [16]. The questionnaire consists of 5 questions with response choices and scores. It was used for a quantitative estimation of the degree of motivation or readiness to quit smoking. Only 392 participants undertook this test. There were 168 smokers who successfully gave up smoking and remained abstinent more than 1 week after smoking cessation assistance and 224 smokers, who were unable to stop smoking. Adjusted odds ratio (OR) and 95% confidence intervals (CI) were calculated and are

Table 7 Association between the number of cigarettes smoked per day and the outcome of SCS assistance (N = 1110)

Number of cigarettes smoked per day	Number of smokers who		OR	(95% CI)
	Stopped smoking for >1 week (n = 467)	Could not quit (n = 643)		
<11	81	84	1.00	Reference
11—20	269	382	0.73	(0.52—1.04)
21—30	78	110	0.74	(0.47—1.14)
>30	39	67	0.60	(0.35—1.03)

Table 8 Association between the number of years of regular smoking and the outcome of SCS assistance (N = 1109)

Number of years of regular smoking	Number of smokers who		OR	(95% CI)
	Stopped smoking for >1 week (n = 467)	Could not quit (n = 642)		
<5	17	22	1.00	Reference
5—9	48	47	1.32	(0.63—2.70)
10—19	108	116	1.20	(0.61—2.39)
20—29	95	131	0.94	(0.47—1.88)
>29	199	326	0.79	(0.41—1.53)

Table 9 Association between the score on tobacco dependence and the outcome of SCS assistance (N = 1109)

Fagerstrom test score	Number of smokers who		OR	(95% CI)
	Stopped smoking for >1 week (n = 466)	Could not quit (n = 643)		
1—4	151	187	1.00	Reference
5—7	221	311	0.88	(0.66—1.17)
>7	94	145	0.80	(0.56—1.15)

Table 10 Association between degree of motivation to quit and cessation (N = 392)

| Motivation score | Number of smokers who | | OR | (95% CI) |
	Stopped smoking for >1 week (n = 168)	Could not quit (n = 224)		
<6	10	41	1.00	
6—7	61	79	3.17	(1.46—6.89)
8—9	87	102	3.50	(1.65—7.42)
>9	10	2	20.50	(6.71—62.6)

presented in Table 10 to evaluate the association between the degree of motivation to quit and the results of smoking cessation assistance. Smokers who had a higher score of motivation were more likely to quit than smokers with a lower score. Those with a score of 6—9 were 3—3.5 times while those with a score >9 were 20 times more likely to quit smoking and maintain abstinence for 1 week or more than smokers with a score of <6. These data show a significant association between the degree of motivation or readiness to quit and cessation.

The SCS included educational and motivational activities, behavioral and relaxation training and also teaching about pharmacological methods including nicotine replacement therapy (NRT). All smoking cessation assistance activities were provided free of charge except for the cost of NRT and other medications. All smokers were recommended NRT but only about a half purchased and used it. NRT use was likely related to several factors: affordability, level of tobacco dependence, belief in NRT efficacy and possibly other factors. We did not have the opportunity to examine all these factors. Only long-term (>12 months) cessation was significantly higher among male smokers who used NRT in comparison with smokers who did not used NRT, 8% and 3%, respectively

(p < 0.05) (Table 11). Among women, all cessation longer than 1 month was significantly higher among those who used NRT than those who did not, 43% and 23%, respectively (p < 0.001) (Table 12).

Discussion

Tobacco control remains a critical public health challenge in Russia. The development of acceptable and effective cessation resources that can be delivered to large numbers of smokers can play a major role in confronting the alarming smoking situation in the country. Increasing availability of tobacco cessation to adults is critically important to improve public health in the short and medium term.

The following reasons underly our choice of the SCS method:

- it can be affordable and available to the majority of current smokers willing to quit;
- group counseling has been shown to be a cost-effective use of physician time because 10—15 smokers can be served simultaneously;
- it is more realistic in Russia to inspire and train 1—2 physicians from every clinic for smoking cessation assistance than all of them;

Table 11 Smoking cessation and NRT use (377 men)

| NRT use | N | No effect | Cut down | Quit for | | | |
				<1 month	1—6 months	7—12 months	>12 months
Yes	168	25 (15%)	39 (23%)	39 (23%)	40 (24%)	11 (7%)	14 (8%)[*]
No	209	23 (11%)	71 (34%)	46 (22%)	46 (22%)	17 (8%)	6 (3%)[*]

[*] p < 0.05.

Table 12 Smoking cessation and NRT use (278 women)

| NRT use | N | No effect | Cut down | Quit for | | | |
				<1 month	1—6 months	7—12 months	>12 months
Yes	145	33 (22%)	23 (16%)	27 (18%)	40 (28%)	13 (9%)	9 (6%)
No	133	19 (14%)	44 (33%)	39 (30%)	23 (17%)	4 (3%)	4 (3%)

- behavioral change is sometimes easier to achieve in a group setting, where there is emotional support from group members with common interests and aims than with individual approaches;
- it is easy and cheaper to provide teaching supplies for groups than individually.

In our experience, middle aged and older smokers were more motivated to stop smoking likely because of the onset of tobacco-related health consequences. Among these, women were more motivated than men.

The age of initiation of smoking appears to be lower in younger cohorts. Among smokers less than 30 years of age, 41% men and 33% women began regular smoking before 15 years of age whereas the corresponding figures for smokers over 49 years of age were 21% and 1%. These findings underscore the importance of providing smoking prevention activities before age 15 years and should be taken into consideration for the development of a smoking prevention strategy in the country.

The majority of smokers participating in SCS, 76% of men and 60% of women had a high degree of tobacco dependency (5 or more points on the Fagerstrom test). Even in the younger age group under 30 years, 58% of smoking women and 70% smoking men were highly dependent. Moreover, more than 90% of smokers had quit attempts in the past, the majority of them without any success. Therefore the great majority of current smokers need skilled smoking cessation assistance.

A great majority (about 80%) of the study cohort almost independently of age and sex identified some harm from their smoking. Since this was a group that sought help, the percentage among all smokers in the general population may be less.

The majority of smokers who attended SCS achieved some success with 18% of men and 13% of women remaining abstinent at one year follow up. These data are similar to other reports in the range of 10—30% [14,17—21].

Our study also confirms the findings from others about factors that are associated with successful cessation including past successful quit attempts, number of cigarettes smoked per day and degree of motivation or readiness to quit smoking [22—24].

Our study has some important limitations. It was not a randomized controlled trial. Therefore conclusions about the effectiveness of NRT particularly its impact only on long-term abstinence are tenuous. Furthermore, the loss to follow-up (29%) was quite high. If all non-responders are assumed to have remained smokers, the size of the intervention effect is reduced. Another limitation of the study is the low attendance rate (only 9%) at the follow-up visit. Therefore the follow-up survey to determine smoking status and cessation outcomes has a limited validity relying on self-reported quit rates. Unfortunately, it was not possible to estimate the cost-effectiveness of the SCS, as necessary data were not available.

Conclusion

SCS is an effective model of smoking cessation assistance particularly for those who are motivated to quit. It should be used in most public health settings and be integrated into the national health care system in Russia. Group counseling may be the most cost-effective use of physician time for smoking cessation assistance and it does not need additional financial or human resources for implementation. The challenge is to motivate and recruit health professionals to acquire the necessary skills to implement SCS in a wide range of public health services locally as well as regionally. Further research should address cost-effective ways of enhancing the impact of this program.

Acknowledgments

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