EFFECTIVENESS OF SCHOOL PROGRAMS IN TOBACCO CONTROL

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SUMMARY

The authors reviewed published data dealing with the effectiveness of school programs in tobacco control. Most of the evaluated school programs showed at least partial effect including namely improved knowledge level, decreased prevalence of smoking initiation and continuation. Less successful was achieving of behavioural changes and social resistance. Effect of the school programs can be significantly amplified by combination with other interventions such as mass media campaigns, parent involvement and extracurricular activities.

The main problem of the studies in this field is a relatively short follow-up time not allowing considering findings as relevant evidences for long-term effects of school programs. However, even assuming only time limited decrease of prevalence of smoking among intervened students, such temporary effect leads to the decrease of a lifetime cigarette exposure having beneficial health effects.

Considering social, demographic and cultural aspects of the epidemiology of smoking habit, evidence based data in this field, relevant for Central and Eastern Countries, are required. Such situation calls for authentic trials and studies respecting specific conditions in these countries.

Key words: tobacco, school programs, prevention

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INTRODUCTION

Smoking is the most important preventable cause of premature death and loss of health in developed countries (1, 2). Tobacco control became one of the priorities of the World Health Organisation (2) and effective smoking prevention represents a very important public health problem. Since smoking initiation starts as early as in childhood (3), measures of primary prevention should be focused on this age group. One of the possibilities are school based programs (4) implemented in numerous countries.

Our objective is to present a review of the published scientific data on school programs in tobacco control, to evaluate their effectiveness and to summarise the most important findings, particularly from the public health aspect.

MATERIAL AND METHODS

For information retrieval we used the Medline, ACP Journal Club (ACP), Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews (CDSR) and Database of Abstracts of Reviews of Effects (DARE) via Ovid Online System (5) and closed it as to October 31, 2003. The following combination of keywords was used: keyword "school" and MeSH "smoking/prevention and control". Involved were the original articles dealing with the effects of tobacco control school programs and have been published since 1996 onwards. Left out were the repeating references, editorials, letters to the editor and papers not meeting the mentioned criteria for this review.

Eventually 29 references were thus selected. 25 of them were controlled trials and studies (6–30), 3 were uncontrolled studies (31–33) and one was the cost-benefit analysis (34).

RESULTS

Most of the studies were targeted on general schoolchildren population (the whole classes or schools were intervened). One trial evaluating smoking cessation program among school children was carried out among those interested in cessation (6). Outcomes were measured most frequently via self-reports (questionnaires) (7, 9–13, 16–20, 22, 23, 25–33), while in some trials also objective methods (measurement of carbon monoxide) were employed to assess the current smoking status (6, 8, 14, 15, 21).

The selected references mostly bring at least partial significant effect and only a single trial concluded such intervention as completely ineffective (the study of a classroom program based on the transtheoretical model of behaviour change) (8). Positive effects of the interventions included most frequently the decreased prevalence of smoking initiation and influenced positively the continuation of smoking at least in some subgroups of the studied samples (6, 7, 9–14, 17, 20–24, 26, 27, 30, 32). Another positive effect was an improved knowledge level on health effects of tobacco (7, 10, 13, 16, 19, 25, 31). In one study the intervened students presumed a significantly less smoking after 20 years, however the decrease of smoking prevalence after intervention remained statistically insignificant (28), thus showing a discrepancy between their attitudes and actual status.

According to the findings of a longitudinal study, a part of the Hutchinson Smoking Prevention Project, the training of teachers

showed a positive impact on the effectiveness of classroom based programs (18). An article presenting results of the North Karelia Community Project evaluated effectiveness of the intervention by the cumulative exposure of tobacco, which was 22% lower in intervened groups than in control groups. However, smoking prevalence 15 years after intervention remained significantly lower only among non-smokers at baseline (29). Besides the intervention focused on educational activities, also the restrictive measures implemented in schools resulted in reduced teenage smoking (33).

However, failures in smoking reduction occurred in some of the target groups (8, 11, 12, 23, 28). Two references reported effects of D.A.R.E. (Drug Abuse Resistance Education) school--based program. One of them showed significant reduction in cigarette smoking after completion of the program (7). However, the second one, evaluating results after one-year follow up time, showed significant effect only if the extracurricular activities including parental involvement and community actions were added (D.A.R.E. plus program)(23). Impact of intervention was higher in high-risk classes (high prevalence of smoking at the baseline) than in low-risk classes (12, 15). Preventive measures showed higher effect among non-smokers or occasional smokers than among current smokers at baseline (11, 12, 20, 24, 29, 30). Considering sex differences, some studies report failure of the effect among girls (11, 23), while another one was less successful among boys (27). In other programs, achievement of behavioural changes, attitudes and social resistance failed (16, 19). Considering the used interventions, combination with mass media campaigns showed higher effect compared to school programs alone (15). Similarly parental involvement and extracurricular activities increased the impact of school programs particularly among boys and among non-smokers (11, 23, 26). Among smokers interested in quitting, classroom-based activities achieved higher cessation rate than distributing of pamphlets (6). Comparing providers (health educator/nurse vs teacher) (12, 29) or training methods (workshop vs self-preparation) (12), no significant differences have been found and about equal effect was found regardless of the provider and the used method.

Most of the studies evaluated results up to several weeks after completion of intervention (6, 7, 9, 12–14, 16–21, 24–28, 30–32,), some of them after one year (4, 8, 10, 22, 23) and after two years (11, 15). One study provides evaluation of intervention after 15 years (29).

Benefit-cost ratio of school programs, considering the lifetime savings of health care and productivity, has been estimated as high as 15.4 assuming such a program would reduce smoking by 6% initially and 4% indefinitely (34).

DISCUSSION

We are aware that the retrieved references show certain differences, which however in such type of studies can be to some extent expected. These variations in the results can be explained by the diversity of the studied target group, the interval for evaluating results as well as the research methods. Therefore, in evaluation of such studies, these factors should be thoroughly considered.

If we consider effect of such programs from broader aspect, the most of the selected references showed success, since although significant reduction in tobacco use was not achieved, changes in the knowledge level and attitudes are promising for the changes in life-style in the future. In more rigorous view, only a part of the selected references showed actual success represented by changes of smoking habit and other more effective ways of tobacco control among school children are needed. It seems, that enhancement by additional extracurricular activities such us parental involvement, mass media and community actions could be helpful, as indicated by the successful programs including such components (11, 17, 20, 23, 24, 26, 27, 29, 31).

School programs should be launched as soon as possible, since their effect is stronger among those who have never initiated smoking (11, 12, 20, 24, 29, 30). Beside this, in considerable proportion of teenage smokers nicotine dependence developing relatively shortly after initiation (35) makes the cessation process even more difficult.

There is evidence, that even relatively small decrease in smoking prevalence is highly cost-beneficial, particularly from long-term aspect. It suggests that school programs are an effective preventive tool, particularly when accompanied by other activities and campaigns (34).

The main problem of the reviewed studies is a relatively short follow-up time - in most of the studies less than one year. Their findings thus cannot be considered as relevant evidences for long--term effects of school programs. Only one study followed up the studied cohorts for 15 years and a gradual decrease of difference between smoking prevalence of intervention groups and controls was observed, remaining significant only among non-smokers at baseline (29). To better understand the role of school programs in initiation and development of smoking habit from long-term aspect, appropriate study designs should be looked for, particularly those dealing with the problem of dropping-out participants after school leaving.

Epidemiological surveys suggest (36), that the experiences on this issue originating mainly from the USA and Western Countries cannot be fully implemented in Slovakia and other Central and Eastern European countries and the current situation calls for authentic studies and trials focusing on determinants of adolescents' smoking (37), respecting specific social, cultural and economic conditions. Only the guidelines based on such studies can be successfully applied for effective school programs included in tobacco control activities in the specific situation.

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