Types of Interventions for Smoking Prevention and Cessation in Children and Adolescents

Tipuri de intervenții pentru prevenirea și stoparea fumatului la copii și adolescenți

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Abstract

Smoking among children and adolescents is a pressing public health issue that demands the development, improvement and implementation of programmes aimed at the prevention and cessation of smoking on a global scale. The objective of our article is to review the main types of interventions for smoking prevention and cessation among children and adolescents. These interventions are based on a wide variety of approaches and include school-based programmes, primary and secondary care-based interventions, programmes targeting parents and family, community-based programmes, social marketing programmes and media campaigns, legislative interventions and computer and other IT-based interventions. Generally, there is still a paucity of low level evidence regarding the efficacy of most smoking prevention and cessation programmes for children and adolescents except for a few particular types of interventions that are reasonably well documented.
Keywords: *intervention, smoking prevention, smoking cessation, children, adolescents*

Rezumat

Fenomenul fumatului în rândul copiilor și adolescenților reprezintă o problemă de sănătate publică de mare actualitate care impune dezvoltarea, perfecționarea și implementarea pe scară mai largă a programelor de prevenire și stopare a fumatului destinate populației aparținând acestor categorii de vârstă. Obiectivul referatului de față este de a trece în revistă principalele tipuri de intervenții pentru prevenirea și stoparea fumatului la copii și adolescenți. Aceste intervenții se caracterizează printr-o mare diversitate de abordări și includ: programele școlare, intervențiile individuale din cabinetele medicale/spitale, programele care vizează părinții și familia, programele comunitare, programele de marketing social și campaniile media, intervențiile legislative și intervențiile asistate de calculator sau alte mijloace specifice societății informatizate. Cu excepția unor tipuri particulare de intervenție a căror eficiență este rezonabil documentată, dovezile existente în privința eficienței programelor de prevenire și stopare a fumatului la copii și adolescenți sunt încă puține și de nivel redus.
Cuvinte *cheie: intervenție, prevenirea fumatului, stoparea fumatului, copii, adolescenți*

Introduction

Smoking annually causes more than 5 million deaths worldwide, and current trends show that tobacco use will cause more than 8 million deaths annually by the year 2030[1]. According to recent estimates, smoking will be responsible for up to 10% of the total deaths worldwide[2]. Life expectancy in smokers is on average 10 years shorter than in non-smokers[3].

Studies monitoring tobacco consumption among youth in various countries have shown that it equally affects developed and developing countries[4]. In Romania the latest national studies as part of the Global Youth Tobacco Survey (GYTS) programme have shown that 41.2% of sixth, seventh and eighth grade students have smoked at least once and 13.5% are current smokers (have smoked at least one cigarette in the past 30 days)[5]. Current tobacco use among teenagers in South-Eastern Europe ranges between 5.6% - 33.1%[6]. Daily smoking rates among 15 years old Romanian adolescents vary between 6.4% - 12%[7,8], which is still worrying.

The objective of the current review is to present the types of interventions for smoking prevention and cessation in adolescents, starting from the classical models and progressing to the latest computer assisted methods.

1. School-based programmes

Schools are considered the most convenient sites for delivering tobacco related education to children and adolescents. The health education curriculum presented by teachers or trained specialists is the most widely accepted and used intervention in anti-tobacco education. The curriculum can be based on various theoretical models such as the rational model (conveying knowledge/information), the affective-emotional and social skills development model (influencing attitudes, beliefs and motivations), the learning or social influence theory (addressing factors that influence the initiation of smoking such as the attitude of colleagues and family, the influence of mass-media and other cultural and social factors), and various mixed approaches[9].

A group of 231 adolescents (132 young females and 99 young males) from 8 Romanian high schools participated in the Adolescent Smoking Cessation programme with the following results:

8.2 % quitters, 20 reducers and 48 participants tried to stop smoking at least once during the project. The six months follow-up showed that 10 adolescents were still abstinent and 4 were still reducers. The "I do not smoke" programme was performed in 2006 and was comprised of 27 classes of adolescents aged 13-14 from Cluj-Napoca. The "Quit & Win for young people" contest was implemented between 1 October - 30 November 2005, 6000 registration forms were distributed in 35 high schools in the following cities: Bucharest, Iași, Cluj, Constanța and Timișoara. 67.3% of the interviewed subjects registered for the contest (4038 persons), 24% were current smokers and 76% never smoked[10].

Interventions targeting school rules are considered essential and increase the efficiency of the smoking prevention curricula. Important components of these interventions are represented by setting up penalties for breaking the rules (warning, contacting parents, expelling from a class/school) and identifying the persons that are responsible for enforcing the punishments.

In peer-based school interventions older students play a key role in the programme as role-models for younger students. Such programmes include student-led activities set up in a school environment[11].

Regarding the evidence supporting school-based programmes aimed at preventing smoking, a Cochrane Review published in 2013 identified 49 such randomised controlled trials with an overall enrolment of 140,000 school children[12]. The effectiveness of the programmes appears to vary according to the type of programme and the timeframe that was utilised for assessing success. One year after the intervention the overall effect was insignificant, except for programmes which taught young people to be socially competent and to resist social influences. These particular types of programmes were found to be more effective than others with a significant outcome observed both after one year and at the latest follow-up. Programmes based on social influences proved to be ineffective (no overall effect at any time), multimodel interventions and those which only conveyed information were similarly ineffective[12].

Incentive programmes in schools were addressed in a Cochrane meta-analysis in 2012 and they did not confirm the prevention of smoking initiation among youth, although the studies were scarce (7 controlled trials), of different quality, and all except one were trials of the Smoke free Class Competition (SFC)[13].

A more recent review published in 2014 was carried out to assess the effectiveness of policies aiming to prevent smoking initiation among students by regulating smoking in schools. The authors found only one study meeting the inclusion criteria, a study comparing two 'middle schools' from two different regions in China with no difference between the intervention school (introduction of a tobacco policy, environmental changes, and communication activities) and control school. However, the reviewers considered it to be at high risk of bias. 24 observational studies were also described for the purpose of hypothesis generation. The conclusions were that there is no evidence to support school tobacco policies (STPs) and that the absence of reliable evidence for the effectiveness of STPs is a public health concern[14].

2. Primary and secondary care-based interventions

Another common setting favourable for tobacco cessation interventions is represented by primary care offices providing health services to children, adolescents and their parents.

Family physicians and paediatricians have excellent opportunities during the medical consultations to initiate brief interventions to prevent and stop tobacco use in youth and parents who use tobacco[15]. The primary care specialists' authority and their proximity to both the young patients and family members could enhance the effectiveness of such interventions[16].

Family practitioners and all the other clinicians should assess the smoking status of children under the age of 18. The screening of tobacco related habits should be coupled with clear messages about the importance of quitting smoking and avoiding any other tobacco products. Clinicians should also ask parents if they smoke, and encourage them to quit, in order to protect children from the harmful effects of environmental tobacco smoke[17].

Studies have shown that counselling parents in paediatric clinics can be efficient, and often results in an increased number of parents that stop smoking. While research suggests that the medical professionals are not taking full advantage of opportunities to deliver cessation messages, a randomized controlled trial that included 22 paediatric practices located throughout the USA demonstrated that delivering tobacco control assistance to parents in the paediatric offices can be effectively implemented in practice[18].

3. Interventions targeting parents and families

These programmes are based on the idea that the family environment influences young children. The smoking risk in children is influenced by several family-related factors: parents' smoking habits, approval/disapproval of smoking by parents and children's perception about it, parenting style, family structure, smoking rules at home, socio-economic status and education[9].

Smoking prevention programmes targeting the family environment consist of counselling the parents, offering information and resources in various formats (brochures, workshops, training etc.) and aim at developing parenting abilities, offering assistance to parents who are smoking but wish to quit, increasing the level of awareness regarding smoking, and changing the attitude towards smoking[11].

According to a Cochrane Review, family-based interventions are supported by moderate quality evidence (on the GRADE Working Group scale) showing that a family intervention might reduce uptake or experimentation with smoking between 16 - 32%, with the strong-

est evidence in case of high intensity programmes used independently of school interventions[19]. According to the authors, the common feature of high intensity interventions that were effective was encouraging authoritative parenting. They defined this as showing strong interest in and care for the adolescent, often with rule setting. This method was clearly differentiated from authoritarian parenting and neglectful parenting[19].

4. Community-based interventions

These programmes are addressed to the community in the wider sense of the term, including families, groups of friends, mass-media, governmental institutions, civil or religious non-governmental organisations. All these factors influence the social environment in which young people make decisions regarding smoking[9,11].

The purpose of these programmes is to influence both individual behaviour and social rules, shaping the social environment favourable to a non-smoking lifestyle. Some community interventions target certain population groups that can influence youth smoking e.g. healthcare workers. Other community programmes can include mentoring and focus on the positive influence of role-models. Another sub-type of community programmes are youth leisure programmes which consist of conveying anti-smoking messages by means of sports, youth centres, gyms, youth clubs, etc[9,11].

Based on a Cochrane review from 2013 there is some evidence to support the effectiveness of community interventions in reducing the uptake of smoking in young people, but the evidence is not strong (very low on the GRADE Working Group scale) and contains a number of methodological flaws[20]. This conclusion was based on twenty-five studies included in the review (sixty-eight studies did not meet all of the inclusion criteria).

5. Social marketing programmes and media campaigns

Social marketing includes advertising, public relations, media campaigns via television, radio, internet, street billboards and printed media. Messages transmitted via mass-media have the advantage of reaching a large number of young people, but a review showed that although there is some evidence that mass media can prevent the uptake of smoking in young people, the evidence is not strong and contains a number of methodological shortcomings[21]. This review found seven studies reporting about media smoking campaigns that met all of the inclusion criteria. All seven studies used a controlled trial design and three of them concluded that mass media reduced the smoking behaviour of young people. The common features of all effective campaigns were: a solid theoretical basis, using formative research in designing the campaign messages, and reasonably intensive broadcasting over extensive periods of time[21].

The efficacy of media campaigns increases if they are integrated in a complex strategy, together with other types of programmes[11].

6. Legislative interventions and programmes that target smoking rules

Legislation banning tobacco sale to young people under a certain age is efficient especially when it operates concomitantly with other interventions/programmes. This category includes: activities to inform and train retail staff, mass-media campaigns to raise awareness on legislation, unexpected inspections to insure that laws are respected, applying penalties in case interdictions are not respected and offering motivational incentives to follow legislation, designing strategies regarding pricing and taxes applicable to tobacco products, as studies suggest that young people are influenced by the cost of cigarettes, the enforcement of legislation forbidding direct and indirect advertising for smoking, using health warnings under the form of texts or images on cigarette packages, and banning smoking in public areas.[9,11]

Legislative measures contribute to the limitation of cigarette sales to young people under a certain age if they are widely disseminated via mass-media and if complementary measures are enforced at a local level[22]. A meta-analysis published in 2008 assessed the effects of interventions to reduce the access of young people under a certain age to tobacco by keeping back shopkeepers from illegal sales[22]. There was limited evidence for an effect of intervention on youth perception of ease of access to tobacco, and on smoking behaviour. This was likely due to the fact that few of the studied communities in this review achieved sustained levels of high compliance. The results showed that providing information to salesmen was less effective in reducing illegal sales than active law enforcement and/or multicomponent educational strategies[22].

7. Computer and internet assisted interventions

According to a report published by the Department of Health of the Australian Government, computer and internet assisted interventions are capable of reaching large groups of children and adolescents through IT devices and internet access. These interventions ensure a relatively high privacy and the possibility to adapt the information and the programme to the individual level. Moreover, information can be accessed independently and the programme can be completed at a speed that is convenient to each user. From the financial point of view, these interventions are cost-effective. These types of programmes offer the possibility of setting up support networks for teenagers who wish to quit smoking through bidirectional discussion and communication forums[11]. In a review published in 2008 the authors concluded that using internet and text messages is promising if these programmes last long enough[23]. The results of a review published in 2009 suggest that internet-based interventions can assist smoking cessation, especially if the information is appropriately tailored to users and frequent automated contacts with users is ensured, however trials did not prove consistent effects[24].

SmokingZine is a prevention and cessation programme via the internet developed at the University of Toronto as part of the TeenNet Research Programme. *SmokingZine* was designed for youth between 12 - 19 years-old and aims to prevent initiation of smoking and to either help stop smoking or to reduce the number of cigarettes smoked. *SmokingZine* is an interactive website that has 5 steps and includes: self-assessment tools about understanding smoking and its consequences, educational games and also sections that enable youth to interact with each other. The website offers the opportunity to connect to other young people in order to give support in the smoking cessation process and maintaining non-smoking status. *SmokingZine* can be used by young people on their own as a self-help tool and also as a way for healthcare or teaching staff to offer support on smoking-related issues in a clinical or school context[25].

Click City: Tobacco is a smoking prevention programme for schools via the intranet. It is addressed to fifth grade children and it includes a follow-up in the sixth grade. The components of the programme target the etiological and predictive mechanisms of the predisposition and future intention to smoke, mechanisms that were documented theoretically and empirically. Short term results observed in 47 primary schools showed changes in the intention and predisposition to smoke during the entire duration of the study, demonstrating the short-term efficacy of the programme. However, the programme was not effective for students with high risk of smoking[26].

Although initially it was thought that the programme will not be accessible in all schools due to lack of computers with a connection to the internet, a survey made by the National Centre for Education Statistics in 2005 showed that 93% of primary schools and 95% of classes had access to the internet. This survey found no differences when comparing schools including different proportions of minority groups and children coming from families with different incomes. This led the authors to suggest that most of the students would have access to the program, once disseminated[26].

Fun without Smokes is an internet mediated smoking prevention programme for students aged 10-13 years old. The intervention is going to be assessed in a randomized controlled study that includes two intervention groups and one control group. The main variables that are monitored will be the smoking status and the use of the website *Fun without Smokes*. The assessments will be performed at the beginning of the programme and at 12 and 24 months. The antismoking programmes previously carried out in schools required huge time investments from the participating schools, which led to a feeling of frustration and a high rate of drop-outs. The *Fun without Smokes* programme requires less involvement and time investment of teachers, which is in harmony with requirements not to overload the school timetable[27].

ASPIRE is an interactive smoking prevention and cessation programme that is computer assisted and internet-based. It is addressed to high-school students from diverse cultural backgrounds. It is based on the transtheoretical model of change and includes five main sessions and two booster sessions. The efficacy of ASPIRE was assessed on a sample of 1,574 10th grade students from 16 schools in Houston, Texas, USA. The *ASPIRE* programme seems promising in reducing smoking among adolescents. The rate of smoking initiation in the intervention group was reduced within 18 months and the participants presented an improved decisional balance and also a reduced addiction score. The authors could not rigorously evaluate the impact of the programm on quitters due to the small number of smokers in the sample[28,29].

The *ASPIRE – Romania* programme is the locally adapted version of the American multimedia application and is available in Romanian and Hungarian.

The implementation of the *ASPIRE-Romania* project started in November 2014 with a sample of about 2000 ninth grade students from Tîrgu-Mures. The participants were randomized at school level in an intervention group and a control group in equal numbers. The computer-assisted intervention includes interactive multimedia content such as videos, animations, interactive games, quizzes and activities. The students were granted access individually to the content during one hour in the IT lab. The intervention consisted of five sessions, each lasting 40-45 minutes over six weeks. During the next semester the students participated in one follow-up session.

ASPIRE-Romania is the first project that attempts to implement an online, computer assisted intervention addressing adolescents in Romania, and is part of an international research project entitled "Contribution to Tobacco Science in Romania" coordinated by experts

from the USA and Hungary and is financed by the Fogarty International Center from the United States in partnership with National Health Institutes (NIH). The efficacy of the programme is going to be assessed based on a comparative analysis of variables collected pre and post intervention[30].

Conclusions

The interventions for tobacco prevention and cessation in adolescents are complex programmes. The most effective school-based programmes are those that teach young people to be socially competent and to resist social influences. The lack of reliable evidence for the effectiveness of other school-based programs is a public health concern.

Parent counselling in paediatric clinics can increase the number of parents that stop smoking. Medical office-based interventions represent opportunities to initiate brief interventions to prevent and stop tobacco use in youth and parents.

Family-based interventions have moderate quality evidence, with the strongest evidence for high intensity programmes used independently of school interventions, based on encouraging authoritative parenting.

Assessments of community-based interventions and social marketing programs showed that there is low level evidence regarding the prevention of smoking initiation in young people. Mass media interventions positively altered the smoking behaviour in young people and the common features of all effective campaigns were: solid theoretical basis, using formative research when designing the campaign messages, reasonably intensive broadcasting over extensive periods of time, and the integration of complex strategies together with other types of programs.

Legislative interventions showed limited evidence for an effect on youth perception of ease of access to tobacco, and on smoking behaviour.

Computer and internet assisted interventions reach a large population of young people. These tools can assist smoking cessation, if the information is appropriately tailored to the users, with frequent automated contacts. The *ASPIRE Romania* program seems promising for reducing smoking in adolescents. ■

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