

Differences in the effects of anti-tobacco health education programme in the areas of knowledge, attitude and behaviour, with respect to nicotine among boys and girls

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Abstract

Introduction. Health education used for increasing the effectiveness of intervention actions should cover a number of factors which exert an effect on learning.

Objective. Recognition of the extent to which gender may determine the effects of an anti-tobacco health education programme.

Material and methods. The intervention study was undertaken in May 2007, and covered 859 first-year schoolchildren in Białystok. The sample was selected by means of two-stage stratified sampling with consideration of two groups: an intervention group and a control group.

Results. In the group of girls, the 2-year educational programme resulted in an increase in knowledge concerning the negative effects of cigarette smoking by 21%, and being familiar with anti-tobacco actions and campaigns carried out in Poland by 24.5%. Among boys, an increase was observed only with respect to the knowledge of anti-tobacco actions and campaigns – by 10.7%. Considering the attitudes of girls after the completion of the programme, changes were noted with respect to three from among the six elements analyzed. However, among boys, after completion of the project, no changes were noted in any of the analyzed elements of attitude. In girls who participated in the anti-nicotine programme, the percentage of smokers did not increase, while an increase in this percentage was observed among girls of the control group and boys in both groups.

Conclusions. Different effects of the 2-year anti-tobacco programme obtained in the area of knowledge, attitude and behaviour should constitute a premise for the modification of educational programmes from the aspect of the variety of methods, techniques and instruments which would be adequate for adolescents' predispositions resulting also from their gender.

Key words

Tobacco smoking, anti-tobacco health education programme, junior high school adolescents, gender, health education

INTRODUCTION

Tobacco smoking still remains the major risk factor of civilisation diseases, and at the same time, one of the few which are impossible to totally eliminate [1, 2]. The results of epidemiological studies indicate that a reduction, and ultimately elimination of tobacco smoking, unequivocally brings about a beneficial health effect [3]. Adolescents are the population group who require special care and attention, because cigarette smoking at such a young age not only causes a number of direct hazards for health and normal development, but also contributes to the development of civilisation diseases and, associated with them, premature deaths in the future. Considering these premises, in many countries, and in the last decade also in Poland, health education programmes began to be implemented, addressed primarily to children and adolescents [4, 5, 6]. Simultaneously, innovative methods are constantly being sought for to increase the effectiveness of intervention actions. Health education used for this purpose as a component of health promotion

should cover a number of factors which exert an effect on learning. These effects are related with the schoolchild (age, gender, intelligence, special skills, cognitive style, interests, aspirations level, motives of learning, attitudes), as well as the process of learning (environment in which the education process takes place, and the way of acquiring, memorizing and sustaining new skills) [7].

Factors determining the effectiveness of learning mentioned in literature are a basis for posing the question and obtaining a reply 'to what extent adolescents' gender may determine the effectiveness of an anti-tobacco health education programme?' This knowledge would be indispensable for the modification of the current anti-nicotine educational programmes and the construction of subsequent projects in order to enhance their effectiveness.

OBJECTIVE

The objective of the study was recognition of the extent to which gender may determine the effects of anti-tobacco health education programme in the field of knowledge, attitude and behaviour among adolescents attending junior high schools in Białystok, northeast Poland.

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MATERIAL AND METHOD

The study originated in May 2007, covered 859 first grade class schoolchildren from 8 public junior high schools in Białystok, from among 3,318 first grade schoolchildren attending 33 public junior high schools in Białystok in a given school-year. The sample was selected by means of two-stage stratified sampling with consideration of two groups: an intervention group covered with educational actions and a control group where education was not carried out. The intervention group covered 417 schoolchildren (224 girls and 193 boys), whereas the control group – 442 junior high school adolescents (220 girls and 222 boys).

The study consisted of two sections: educational (Project: 'Non-smoking junior high adolescent – healthy secondary school student', and evaluative (pre-test and post-test).

During the 2-year educational programme, four educational classes and two competitions were carried out. In each intervention, methods were applied for increasing the level of knowledge and shaping attitude, including skills. The first intervention within the educational programme, which lasted 90 minutes, concerned mainly the negative effect of tobacco smoking on health. The second intervention consisted of 90-minute classes referring to the 'World No Tobacco Day' with presentation of the film 'Tobacco smoking and human physiology' [8]. The third intervention, which also lasted 90 minutes, was devoted to the indication of positive aspects of non-smoking and shaping the skills of assertive refusal. The fourth intervention concerned 45-minute classes in relation with the 'World No Tobacco Day', during which schoolchildren who smoked were confronted with arguments, and encouraged to join this action. The Scheider motivation test to stop smoking was performed, as well as the Fagerström Test for Nicotine Dependence. The scenario of individual interventions was designed according to the methodological guidelines by Woynarowska [7]. The interventions were conducted by students of the speciality of public health within their training in health promotion and health education, under the supervision of a university lecturer and in the presence of school pedagogues.

After the second and fourth interventions, two competitions with awards were also performed (art and photographic) concerning the scope of tobacco-related problems.

The educational programme received the recommendation of the Polish Association for Health Education, and Chief Education Officer in Białystok.

The evaluation section in the form of a survey covered various aspects of nicotine use, both in the study and control groups, before starting the programme and 6 months after its completion, and was aimed at the assessment of the effects of the programme. In order to provide anonymity and to obtain reliable data consistent with the actual replies, the researchers resigned from the identification of the questionnaires. Thus, the evaluation covered the same schoolchildren from the intervention and control groups, without the possibility to associate information from the questionnaires by the same person.

In the study of the effectiveness of the anti-tobacco programme, three types of indicators of the effectiveness of educational programmes were considered: indicators related with the knowledge acquired, indirect indicators (attitude, including skills and intentions), and direct indicators (behaviours related with tobacco smoking).

In order to show the differences in the characteristics evaluated between girls and boys before the programme and after its completion, the Pearson chi-square χ^2 test was used. The p values $p < 0.05$ were considered statistically significant.

RESULTS

Characteristics of the schoolchildren in the study.

The educational programme covered 417 (48.5%) school adolescents, described as the intervention group, while the control group were 442 children attending junior high schools (51.5%). Before the programme, in the intervention group, girls constituted 53.7%, whereas in the control group – 49.7%. In the final study (6 months after the completion of the programme), the percentage of girls was 51.2% and 53.2%, respectively. The percentages of girls and boys between the intervention and control groups did not differ significantly in any of the studies.

Analysis of information from the questionnaires allowed the socio-economic and demographic characterization of the girls and boys examined, with consideration of such variables as: possession of siblings, education level of the mother (caregiver), education of the father (caregiver), family material standard and occupational activity of parents. Both before and after completion of the 2-year educational programme, no differences with respect to the above-mentioned characteristics were observed between the boys and girls, neither in the intervention group nor the control groups. Also, two years after the beginning of the programme, no significant changes in the characteristics examined were noted in girls and boys from both groups.

Table 1 presents the changes in knowledge, attitude and behaviour related with nicotine use among boys and girls in the intervention and control groups after the completion of the 2-year anti-tobacco educational programme.

Knowledge related with tobacco smoking. The effect of the 2-year health education programme was evaluated in the area of boys and girls knowledge concerning three aspects: knowledge concerning the negative effects of tobacco smoking, knowledge of anti-nicotine actions and campaigns carried out in Poland, and so-called 'internalized knowledge' expressed by conviction about the harmful effect of tobacco smoking.

Analysis of adolescents' knowledge concerning the negative effects of tobacco smoking showed that after completion of the 2-year educational programme, in the intervention group, an increase – by 21.7% ($p < 0.001$) – was observed in the percentage of girls who knew at least two negative effects of tobacco smoking, compared to the situation from before the programme. However, this percentage did not change among the boys covered with the programme ($p = 0.285$).

After two years, in the control group, the percentage of boys and girls who were familiar with at least two negative effects of tobacco smoking did not change.

In the group covered by the programme, a significant increase in the knowledge of anti-tobacco actions and campaigns carried out in Poland was observed, both among girls ($p < 0.001$) and boys ($p = 0.044$) which, however, was not found in the control group.

No changes were noted with respect to so-called 'internalized knowledge' expressed by the conviction about the harmful effect of tobacco smoking among boys and girls,



Table 1. Changes in knowledge, attitude and behaviour concerning nicotine among boys and girls in intervention and control groups after 2 years

Questions & most frequent answers	Pre-test/Post-test acc. to gender			
	Group covered by the programme		Control group	
	Girls	Boys	Girls	Boys
Behaviour				
Have you smoked at least one cigarette during the 2-month period before the study? (<i>Yes/No</i>)	13.4% vs. 20.2% p=0.063	13.5% vs. 32.4% p<0.001	13.7% vs. 28.1% p<0.001	20.7% vs. 32.0% p=0.015
Knowledge				
Do you know any negative effects of tobacco smoking? (<i>maximum 1/ 'at least 2'</i>)	53.1% vs. 74.8% p<0.001	36.3% vs. 41.7% p=0.285	55.7% vs. 49.5% p=0.207	34.2% vs. 31.3% p=0.556
Have you heard about anti-tobacco actions or campaigns in Poland? (<i>Yes/No</i>)	44.8% vs. 69.3% p<0.001	47.9% vs. 58.6% p=0.040	51.4% vs. 49.1% p=0.658	47.7% vs. 53.4% p=0.285
How do you evaluate the effect of tobacco smoking on health? (<i>'hazardous'/not hazardous; I have no opinion'</i>)	92.4% vs. 95.3% p=0.233	84.9% vs. 91.2% p=0.063	93.7% vs. 91.0% p=0.326	86.9% vs. 84.4% p=0.485
Attitude				
In your case, what was the reason for smoking the first cigarette? (<i>'curiosity'/offering cigarette by friends, problems, boredom, impressing, willingness to be adult, other reason'</i>)	47.4% vs. 68.9% p=0.047	39.5% vs. 59.4% p=0.044	66.7% vs. 48.5% p=0.440	36.5% vs. 55.0% p=0.002
What is your attitude towards cigarette smoking by adolescents? (<i>'negative'/neutral, positive'</i>)	67.5% vs. 60.5% p=0.137	56.5% vs. 51.9% p=0.372	68.9% vs. 53.9% p=0.002	57.7% vs. 53.1% p=0.384
Do your friends who smoke impress? (<i>Yes/No</i>)	93.9% vs. 98.6% p=0.045	97.6% vs. 96.0% p=0.479	97.0% vs. 96.6% p=0.827	96.5% vs. 96.3 p=0.928
Do you have the courage to admonish someone for smoking cigarettes in your presence? (<i>Yes/No</i>)	81.8% vs. 91.7% p=0.012	72.7% vs. 83.8% p=0.028	79.2% vs. 88.2% p=0.045	73.8% vs. 92.4% p=0.001
Do you find it annoying if you have to stay in a room full of smoke? (<i>Yes/No</i>)	71.0% vs. 76.3% p=0.221	66.0% vs. 62.4% p=0.477	73.4% vs. 67.7% p=0.220	62.2% vs. 57.8% p=0.404
Would you want to give up smoking at present? (<i>Yes/No</i>)	87.0% vs. 77.4% p=0.372	83.3% vs. 65.9% p=0.126	77.1% vs. 88.9% p=0.187	72.1% vs. 66.7% p=0.587

two years after the educational anti-tobacco programme, both in the intervention and control groups.

Attitudes towards smoking. The attitude of the schoolchildren towards the problem of tobacco smoking was evaluated based on their opinion concerning tobacco smoking by adolescents, skills for admonishing someone against smoking, impressing by smoking friends, feeling of discomfort associated with staying in a room full of cigarette smoke, causes for starting the habit, and willingness to discontinue cigarette smoking.

Adolescents attending junior high schools described their attitude towards tobacco smoking by adolescents according to a 5-degree scale – from positive to negative. After 2 years, in girls from the control group, a significant decrease – by 15% (p=0.002) – was noted in the percentage of junior high school girls who had a totally or rather negative attitude towards smoking by adolescents, while in the group of girls covered by the intervention, no changes in this percentage were found. Among boys, no changes in the attitude towards tobacco smoking by adolescents were noted, neither in the intervention nor in the control groups.

The subsequent aspect of the attitude was the perception of smoking by friends as an impressing behaviour. In the group of girls covered by the programme a significant increase – by 4.7% (p=0.045) – was observed in the percentage of schoolgirls who did not consider smoking friends as impressing. Among the boys in the programme, as well as among girls and boys in the control group, no significant changes in this percentage were noted after two years of observation.

The adolescents assessed their skills of assertive response in situations related with cigarette smoking. After completion of the 2-year educational programme, in the group covered

by this programme, a significant increase was noted in the percentage of boys (p=0.028) and girls (p=0.012) who had the courage to admonish someone for smoking in their presence. Similarly, this percentage significantly increased among girls and boys from the control group, p=0.001 and p=0.045, respectively.

The junior high school adolescents in the presented study revealed in the questionnaires the reason for smoking their first cigarette. Among the schoolchildren examined, the primary reason for smoking the first cigarette was curiosity. In the group covered by the programme, after its completion, a significant increase was observed in the percentage of both girls (p=0.047) and boys (p=0.044), who smoked their first cigarette out of curiosity (by 21.5% and 19.9%), whereas in the control group a significant increase in this percentage was noted only among boys. No significant changes were found in girls from the control group.

After completion of the 2-year educational programme, no increase was observed in the percentage of boys and girls who smoked and declared willingness to discontinue smoking, also in the control group no changes were noted in the percentage of boys and girls willing to quit smoking.

Also with respect to the feeling of discomfort associated with staying in a room full of cigarette smoke, after completion of the programme, no significant changes were observed in the percentages of boys and girls, both in the intervention and control groups.

Behaviours related with tobacco smoking. After completion of the 2-year educational programme, in the group of schoolchildren covered by this programme, the percentage of smoking girls prior to and after the intervention did not significantly differ (13.4%; 20.2%; p=0.063), whereas

a significant increase was noted in the percentage of smoking boys – by 18.9% ($p < 0.001$).

In the group of junior high school adolescents who did not participate in the anti-tobacco educational programme, within the 2-year period discussed, a significant increase was found in the percentage of smoking girls – by 14.4%, and boys – by 11.3%.

DISCUSSION

In the literature, evaluations of the effect of gender on the effectiveness of anti-tobacco programmes are not equivocal. Results of evaluation of the programmes 'Project SMART' [9] and 'ALERT Plus' [10] carried out among adolescents in order to limit the use of cigarettes, alcohol and narcotics, showed that educational programmes are effective with respect to girls; however, they are ineffective in the group of boys. However, the anti-tobacco programme 'Youth Study Oslo Smoking Prevention Programme' [11] and the programme for the prevention of the use of cigarettes, alcohol and narcotics 'The European Drug Abuse Prevention Trial (Eu-Dap)' [12], proved to be effective among boys, and ineffective among girls.

The effectiveness of the above-mentioned programmes was evaluated primarily with respect to the anti-tobacco behaviour of the adolescents examined. Therefore, the objective of the presented study was recognition of the extent to which gender may determine the effects of anti-tobacco health education programme, not only in the sphere of behaviours related with cigarette smoking, but also with respect to knowledge and attitudes in the environment of adolescents attending junior high schools in Białystok. While analyzing knowledge concerning nicotine addiction according to gender, positive effects of the 2-year educational programme were observed among girls with respect to two of the three analyzed indicators concerning knowledge (knowledge of the negative effects of tobacco smoking on health, and knowledge of anti-tobacco actions and campaigns carried out in Poland). In boys, an increase in knowledge was noted only concerning anti-tobacco actions and campaigns carried out in Poland.

Despite the above-described changes, so called 'internalized knowledge' among boys and girls expressed by the conviction about harmfulness of tobacco smoking did not significantly change, neither among the adolescents covered nor those not covered by the 2-year educational programme. It should be mentioned that before the programme, a considerable percentage of adolescents covered by this programme declared their conviction about the harmfulness of tobacco smoking – 92.4% of girls and 84.9% of boys, whereas after completing of education – 95.3% and 91.2%, respectively.

The described increase in knowledge among girls could have contributed to the changes in their attitudes observed. The effect of the anti-tobacco programme in the area of girls' attitudes were noted with respect to the following components: negative attitude towards tobacco smoking by adolescents, impressing by smoking friends, and reason for smoking the first cigarette. Among boys participating in the educational programme, no changes in attitude were noted in any of its elements analyzed.

The observation of the adolescents' declarations concerning the reasons for smoking their first cigarette in life was interesting. Among the schoolchildren examined, the primary reason for smoking their first cigarette was

curiosity. An increase in the percentage of boys and girls smoking out of curiosity observed in the group covered by anti-tobacco educational programme may indicate that it is necessary to continue actions on behalf of health promotion, including anti-tobacco education and prophylaxis, not to end the education at the stage of evoking curiosity, which cannot be avoided during the programme. During the 2-year period of observation, the percentage of schoolboys who smoked their first cigarette out of curiosity increased, irrespective of the programme, both in the intervention and control groups; however, in girls, this percentage significantly increased in the intervention group but not in the control group. Nevertheless, despite evoking the girls' curiosity concerning nicotine addiction, the percentage of smokers among them did not increase, which was noted in the group of boys.

Based on information concerning knowledge and attitude it may be presumed that an inhibition of growth in the percentage of smoking girls in the group participating in the programme may result from the increase in knowledge concerning the negative effects of tobacco smoking, as well as change of attitude towards tobacco smoking by adolescents, and lack of acceptance of smoking by friends as an impressing behaviour. With respect to boys, one change observed in the area of knowledge of anti-tobacco actions and campaigns in Poland was not reflected by their behaviour pertaining to cigarette smoking, because the percentage of smoking boys increased.

While searching for the explanation why the anti-tobacco prophylactic programme performed among junior high school adolescents brought about a positive effect in girls, but no such effect in the group of boys, the problem of specificity of the process of learning by boys and girls should be undertaken. In the Eurydice network report presenting analysis of the data from the Programme for International Student Assessment (PISA) and Eurostat, concerning the relationship between gender and effects of education, it is indicated that girls obtained better results in reading than boys, whereas boys were better than girls in mathematics, with the lack of differences in achievements in the area of other exact sciences [13]. In literature, from the domain of pedagogy, attention is paid to the role of so-called varied education, directed towards adolescents according to gender, considering the differences in the way of learning and acquiring skills. Among boys there dominated deductive reasoning, while in girls – intuitive. Schoolgirls prefer definite examples, while boys prefer abstract examples. The latter have a better spatial imagination, while they have problems with fluency in expressing themselves 3 times more frequently than girls. Boys more quickly become fed up during classes, need more space for education and more physical activity, compared to girls, are willing to act and recognize the world in a creative way, and eagerly use coded language for learning (e.g. diagrams), while the girls prefer a written text. In this document, a return to educating boys and girls in separate school forms, or even schools, is even suggested, placing emphasis on the differences in shaping masculinity and femininity, as well as the degree of maturity and psychological development [14].

Both own studies and literature review show that while planning anti-tobacco programmes the differences and specificity of the way of learning and acquisition of skills occurring among boys and girls should be taken into consideration. The selection of educational methods and



techniques should be in accordance with predispositions resulting from gender. With respect to boys, more activation and interactive methods should be introduced, which develop own strategies, motivations and curiosity of learning, such as, e.g. role playing, case study, brain drain, or discussion [15].

The vertical method of communication applied in the programme (communication between individuals or groups occupying different positions in the social hierarchy), although proved to be effective with respect to girls, did not produce the anticipated results among boys. Therefore, a horizontal transmission should be used in the group of boys (information transmitted between individuals of groups occupying the same or similar positions in the social or organizational structure). An example of the method using horizontal communication is peer education, in which young people undertake educational actions among their contemporaries at the same age, environment, or interests. This method is popular not only in the United States, where it was first introduced, but also in Australia, the United Kingdom, Holland, Russia and the Ukraine [16]. Nevertheless, it is recommended that peer education should be one of several methods applied in actions biased towards change in health behaviours within educational programmes [17, 18, 19, 20]. Among other methods using horizontal communication, in recent international literature social-networking websites are quoted as new communication instruments used in anti-tobacco prophylaxis and education [21, 22]. They are based on the Internet, television and news media, such as mini-pages available via cellular phone. An example of this type of action is the campaign 'HELP – For a life without tobacco' directed mainly at adolescents aged 15-25.

A reduction in tobacco smoking in the total population, especially among adolescents, is one of the main tasks within the improvement and strengthening of the health of the population. In anti-tobacco educational actions, varied and effective methods, techniques and instruments should be selected to exert an effect on the change of knowledge, attitude, and behaviour, which would be adequate to the adolescents' gender, in order to obtain increasingly better results in the reduction in the prevalence and consequences of nicotine use.

CONCLUSIONS

1. The 2-year anti-tobacco educational programme inhibited the trend of intensification of nicotine use among girls covered by this programme, which was not observed in girls from the control group and boys in both groups.
2. Among girls, the anti-tobacco educational programme was effective with respect to two of the three indicators of knowledge analyzed (knowledge of the negative effects of tobacco smoking on health, and knowledge of anti-tobacco actions and campaigns carried out in Poland), compared to girls from the control group. With respect to boys, a positive effect of the programme was noted only concerning knowledge of anti-tobacco actions and campaigns carried out in Poland.
3. Considering girls' attitudes, positive effects of anti-tobacco programme were observed with respect to three from among six elements analyzed (negative attitude towards smoking by adolescents, impressing by smoking friends, reason for smoking the first cigarette), while among boys no changes in attitude in any of the aspects analyzed were noted as a result of the programme.
4. The different effects of the 2-year anti-tobacco programme obtained among boys and girls in the areas of knowledge, attitude and behaviour should constitute a premise for the modification of educational programmes from the aspect of variety of methods, techniques and instruments, which would be adequate to the predispositions of adolescents resulting also from their gender.

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