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Knowledge and habits of tobacco among ice-hockey-playing boys

An intervention study

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Key words: Adolescence, Health promotion, Intervention, Oral health, Prevention, Smoking, Snuff, Sports, Ice-hockey, Tobacco, Tobacco habits and knowledge

ABSTRACT

The aim of this study was to investigate tobacco habits among ice-hockey-playing boys in three clubs in the County of Värmland, Sweden and to analyse whether health information about the harmful effects of tobacco could change the players' tobacco habits. In addition, the issue of whether there is any correlation between knowledge of tobacco and its harmful effects with tobacco habits was studied.

Ice-hockey-players from three ice-hockey clubs were represented and one of the clubs acted as a control group. A total of 252 male ice-hockey-players, 12–19 years old participated.

A specially designed questionnaire containing 33 questions on background, socio-economics, behaviour, and knowledge was used. The boys answered the questionnaire on three occasions. The first and second examinations took place on the same occasion with the intervention occurring between the examinations. The third examination was carried out after 3–5 weeks.

The study showed that the use of snuff played a more important role among the ice-hockey-players than did smoking and that they had tried using snuff at the age of 12.

The baseline investigation showed that there were no significant differences between the clubs in tobacco habits and knowledge of the harmful effects of tobacco. After the health information, the boys' knowledge of tobacco and its harmful effects increased significantly ($p<0.001$), but regardless, no change in their use of tobacco was found after 3-5 weeks. Knowledge also increased significantly among the boys in the control group ($p< 0.001$), but no change in the use of tobacco was found here either.

No significant difference could be demonstrated between the group of boys who used snuff and the non-users with regard to their knowledge of the harmful effects of tobacco.

SAMMANFATTNING

Syftet med studien var att kartlägga ishockeyspelande pojkars tobaksvanor i tre ishockeyklubbar i Värmland samt att studera resultaten av hälsoinformation om tobakens skadeverkningar på pojkarnas tobaksvanor. Dessutom har frågan om det finns ett samband mellan kunskap om tobak och dess skadeverkningar och tobaksvanor studerats.

Studien omfattade tre ishockeyklubbar varav en av klubbarna var jämförelsegrupp. Totalt deltog 252 pojkar i åldersgrupperna 12 till 19 år.

Ett frågeformulär användes innehållande 33 frågor fördelade på bakgrunds-, socioekonomiska-, beteende- och kunskapsfrågor. Frågeformuläret besvarades av pojkarna vid tre tillfällen. Undersökning 1 och 2 utfördes vid samma tillfälle med mellanliggande intervention. Tredje undersökningen utfördes efter 3–5 veckor.

Undersökningen visade att snusvanor hade en mer framträdande plats bland ishockeyspelarna än rökvanor och att de provat snusa redan vid 12-års ålder.

Basundersökningen visade inga signifikanta skillnader mellan klubbarna avseende pojkarnas tobaksvanor och kunskap om tobak och tobakens skadeverkningar. Efter hälsoinformationen ökade kunskapen om tobakens skadeverkningar signifikant ($p<0,001$) bland pojkarna, men trots detta kunde ingen förändring av deras tobaksvanor påvisas. Även bland pojkarna i jämförelsegruppen ökade kunskapen signifikant ($p<0,001$) men inte heller här kunde någon förändring av pojkarnas tobaksvanor påvisas.

Ingen signifikant skillnad kunde påvisas mellan de pojkar som snusade och de som inte snusade med avseende på deras kunskap om tobakens skadeverkningar.

INTRODUCTION

Tobacco prevention activities are carried out in the Swedish society at different levels. In spite of this, smoking is one of the major causes of ill health and premature death. According to *Pellmer & Wramner* (1997), important research findings are needed, on e.g. why youth begin to use tobacco and the reasons why some young people who smoke or use snuff can be convinced to quit.

The Swedish National Society for Information on the Harmful Effects of Tobacco has conducted studies annually between 1976 and 1988 on the tobacco habits of the Swedish people. Surveys have shown that the use of tobacco almost always begins before the age of 20 (*Ramström & Tibblin* 1988). Preventive activities must therefore be aimed at these age groups. This is carried out today in many different ways, among others by distributing information in schools and at different medical and dental health care clinics. In a recently published study, *Skjöldebrand & Gahnberg* (1997) reported that the use of tobacco decreased among 12-19-year-old adolescents after being given information about tobacco by dental personnel.

MEDICAL RISKS

Different forms of cancer are perhaps what is most often connected to cigarette smoking, but studies have also shown that smoking increases the risk of heart disease and vascular disorders. Men who died before the age of 55 were found to have had a greater increase in risk if they had smoked or used snuff (*Bolinder, Alfredsson, Englund & de Faire* 1994).

Norwegian studies showed that the oxygen uptake in athletes who used snuff was impaired compared with those who did not (*Strömme* 1986). healthy, middle-aged men, that those who used snu that was higher by 5 bea those who smoked had a higher by 10 beats/minute non-tobacco users. This pulse is probably related to sure (*Bolinder & de Faire* 1

ORAL HEALTH RISKS

The effect of tobacco on been the subject of a num which have been able to use of tobacco is an impor (*Pindborg* 1992). Nicotine tive effect on peripheral bl one study, *Bergström & F* (1983) showed that gin to bleed less in smokers smokers.

Bergström, Eliasson, & showed in an investigation a correlation between sm severity of periodontal dis miological study found a si rence in loss of attachme year-old smokers and non study also found that the n surfaces in the 35-year-old led or had carious lesions ly higher among the smoke the non-smokers (*Axelsson Lindhe* 1998).

In Sweden, it is usual f snuff, and the use of snu among both men and wom with smoking, the nicotin the same effect and is addi lation between snuff and th of cancer in the oral cavity been found (Socialstyrels review of the results fro international studies, *Boli* ported that both epidemio perimental investigations dictory facts on the corre

did not (*Strömme* 1986). In a study of healthy, middle-aged men, it was shown that those who used snuff had a pulse that was higher by 5 beats/minute and those who smoked had a pulse that was higher by 10 beats/minute compared with non-tobacco users. This effect on the pulse is probably related to nicotine exposure (*Bolinder & de Faire* 1997).

ORAL HEALTH RISKS

The effect of tobacco on oral health has been the subject of a number of studies, which have been able to show that the use of tobacco is an important risk factor (*Pindborg* 1992). Nicotine has a constrictive effect on peripheral blood vessels. In one study, *Bergström & Floderus-Myrhed* (1983) showed that gingivitis tended to bleed less in smokers than in non-smokers.

Bergström, Eliasson, & Preber (1991) showed in an investigation that there was a correlation between smoking and the severity of periodontal disease. An epidemiological study found a significant difference in loss of attachment between 35-year-old smokers and non-smokers. The study also found that the number of tooth surfaces in the 35-year-olds that were filled or had carious lesions was significantly higher among the smokers than among the non-smokers (*Axelsson, Paulander & Lindhe* 1998).

In Sweden, it is usual for men to use snuff, and the use of snuff is increasing among both men and women. Compared with smoking, the nicotine in snuff has the same effect and is addictive. No correlation between snuff and the development of cancer in the oral cavity in humans has been found (Socialstyrelsen, 1997). In a review of the results from a number of international studies, *Bolinder* (1997) reported that both epidemiological and experimental investigations present contradictory facts on the correlation between snuff and cancer. That the carcinogenic effect of snuff is less than that of smoking, however, was a consensus of the studies. Animal trials have, on the other hand, shown that the occurrence of tumours was significantly higher in the group of rats that was exposed to a combination of herpes simplex virus and snuff than in the group that was not (*Hirsch, Johansson, Thilander & Vahlne* 1984).

Sinusas, Coroso, Sopher, & Crabtree (1992) found a significant difference in the occurrence of leukoplakia in the oral cavity of baseball players who used smoke-free tobacco year-round and those who did not use tobacco at all. Therefore the use of snuff ought not to be ignored from a general medical point of view.

HEALTH PROMOTION

Preventive activities to reduce the use of tobacco require many different kinds of efforts and methods of approaching the problem. In the promotion of public health, co-operation between different fields such as medical, dental, behavioural science, business, and social is required. Oral health problems have important risk factors in common with a number of chronic diseases such as heart disease, vascular disorders, and cancer. One such risk factor is the use of tobacco.

Persson (1997) has studied different health promotion activities. He found that smoking decreased in persons who had participated in an intervention programme organised under the auspices of primary care.

Tobacco prevention activities that target youth must be made early and in different ways. Adolescent athletes are therefore an interesting group that has also previously been the object of investigations of tobacco habits. The tobacco habits of young athletes in the County of Skåne, Sweden were presented in a study

performed by *Bogarve & Andrén-Sandberg* (1996). In this study, boys who play ice-hockey were not represented, even though ice-hockey is an athletic sport where the use of snuff is considered to be something typical for the players. *Karvonen, Rimpelä & Rimpelä* (1995) showed in their study that the use of snuff was more common among 16–18-year-old boys who were active in an athletic club than among those who did not belong to one.

The overall aim of the present study is based on a general health perspective of the use of tobacco to promote an improvement in oral health. The specific aim was to survey the tobacco habits of 12-19-year-old ice-hockey-playing boys and to study how health information on the harmful effects of tobacco affects the tobacco habits of the players.

An analysis was also made to determine whether there were differences between ice-hockey clubs with different profiles concerning the boys' knowledge of the harmful effects of tobacco. Moreover, we investigated whether a correlation between knowledge of the harmful effects of tobacco and tobacco habits existed.

MATERIAL AND METHODS

PARTICIPANTS

The participants in the study consisted at first of 331 ice-hockey-playing boys born between 1979 and 1986 and who belonged to one of three clubs in the County of Värmland, Sweden: 133 from Färjestads Bollklubb (FBK) in Karlstad, 104 from Forshaga Idrottsförening (FIF) in Forshaga, and 94 from Grums Idrottsklubb (GIK) in Grums. GIK was the control group.

Karlstad, Forshaga, and Grums are three municipalities in southern Värmland. Karlstad, the main city in Värmland, has approximately 80,000 inhabitants of which 3,470 are boys between 12 and 19 years of age. Forshaga municipality with approximately 12,000 inhabitants of which 650 are boys between the ages of 12 and 19 years can be characterised as a 'suburb' of Karlstad while Grums municipality with approximately 10,000 inhabitants of which 486 are boys between the ages of 12 and 19 years can be characterised as an industrial community.

Geographically speaking, the clubs are close to each other, but each has a different profile. FBK represents a large club with an elite team, and FIF and GIK represent smaller clubs in division 2 and the premier division of the Swedish ice-hockey league respectively.

MEASURING INSTRUMENTS

Data was collected using a specially designed questionnaire at three evaluations. Questionnaire I was used at the baseline evaluation and contained a total of 33 questions on background, socio-economics, behaviour, and knowledge. Questionnaire II contained only questions on knowledge while Questionnaire III contained both behaviour and knowledge questions. One of the author's (M.R.) compiled the questions, and some were formulated so that they were identical or almost identical with questions used in previous studies, among others, in the one conducted by *Bogarve & Andrén-Sandberg* (1996). Many of the questions originate from the investigations among youth made by the Swedish Council for Information on Alcohol and other Drugs (Centralförbundet för alkohol- och narkotikaupplysning). The questionnaire contained questions with limited alternatives for answers and the possibility for the respondents to give their own comments and views.

To increase the sensitivity of the questionnaire with regard to the knowledge section, points were given for right answers and deducted for wrong answers.

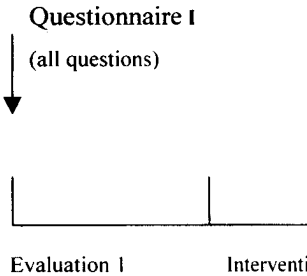

Figure 1. Schematic design of the st

INTERVENTION

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February and March. Figu
design of the study.

STATISTICAL ANALYSES

All statistical analyses we
using the software package
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Table 2. The groups of boys in the st

Age	12	13
FBK*	17	17
FIF*	19	17
GIK*	16	12
Total	52	46

*Ice-hockey club abbreviation

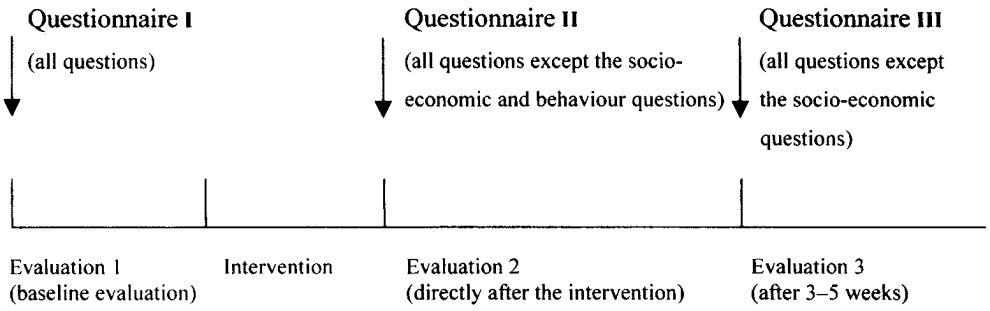

Figure 1. Schematic design of the study.

INTERVENTION

The information programme was given by two dental hygienists with a great deal of experience of health education. The programme was designed so that it could be presented in approximately 15 minutes. Overhead pictures, which gave the opportunity for a dialogue between the presenter and the boys, were used to illustrate the harmful effects of tobacco in general and from the view of oral health. The material touched on all the questions in the questionnaire. Since the information was well structured, the ability of the different teams to reiterate the information was good.

The interventions and the different evaluations took place in the clubhouse during the teams' regular training in February and March. Figure 1 shows the design of the study.

STATISTICAL ANALYSES

All statistical analyses were carried out using the software package SPSS. To evaluate the effect of knowledge and time a one-way ANOVA with the post hoc test Scheffe was used. For mean comparisons Student's *t*-test was used. Results were considered to be statistically significant when $p<0.05$.

RESULTS

Of the original 331 boys, 252 (76%) participated in the study. The reasons why 24% of the original sample did not participate in the study vary and are presented in Table 1. Internal dropout was limited in scope and has therefore not been analy-

Table 1. Reasons for dropping out distributed by ice-hockey club.

REASONS	FBK* (n)	FIF* (n)	GIK* (n)	TOTAL
Illness	3	5	12	20
Injured	3	0	1	4
Away	7	0	0	7
Not available	3	0	2	5
Unknown	15	18	10	43
Total	31	23	25	79
	23%	22%	27%	24%

*Ice-hockey club abbreviation

Table 2. The groups of boys in the study distributed according to ice-hockey club and age.

Age	12	13	14	15	16	17	18	19	Total
FBK*	17	17	13	9	10	16	14	6	102
FIF*	19	17	13	14	8	1	3	6	81
GIK*	16	12	6	5	10	11	7	2	69
Total	52	46	32	28	28	28	24	14	252

*Ice-hockey club abbreviation

Table 3. Frequencies of the boys' smoking habits at the baseline evaluation.

	FBK*	FIF*	GIK*	Total
Smoker		1		1
Never smoked	62	53	34	149
Tried smoking	39	25	34	98
Smoked but quit		1	1	2
Total	101	80	69	250

*Ice-hockey club abbreviation

Table 4. Frequencies of the boys' snuff habits at the baseline evaluation.

	FBK*	FIF*	GIK*	Total
Use snuff	14	6	11	31
Never used snuff	53	52	28	133
Tried using snuff	32	19	28	79
Used snuff but quit	3	1	2	6
Total	102	78	69	249

*Ice-hockey club abbreviation

sed further. As can be seen in Table 2, 183 boys, 102 of whom represented FBK and 81 FIF, received information on tobacco. The control group consisted of 69 boys from GIK.

TOBACCO HABITS

Smoking habits

Only one boy at the first evaluation reported that he smoked. In FBK, 62 (61%) boys responded that they had never smoked and 39 (39%) that they had tried smoking. Similar results were found in the FIF group, 53 (66%) and 25 (31%) respectively. In the control group, GIK, a lower percentage responded that they had never smoked, 34 (49%), and a larger percentage that they had tried smoking, 34 (49%), compared with the two other clubs. However, differences between the clubs were not significant. In both FIF and GIK, one boy reported that he had smoked but had stopped. The boys' reports on their smoking habits at the third evaluation deviated only marginally compared with the baseline evaluation. The boys' smoking habits as reported in the baseline evaluation are presented in Table 3.

Snuff habits

The boys' snuff habits are presented in Table 4. At the first evaluation, 14 (14%) of FBK's boys responded that they used snuff. Among the boys, three reported that they had used snuff but had quit. Fifty-three (52%) of the boys reported that they had never used snuff while 32 (31%) responded that they had tried. Of the boys in FIF, 6 (8%) responded that they currently used snuff, 52 (67%) that they had never used snuff, and 19 (24%) that they had tried it. One boy reported that he had used snuff but had quit. In GIK, 11 (16%) boys responded that they used snuff. The

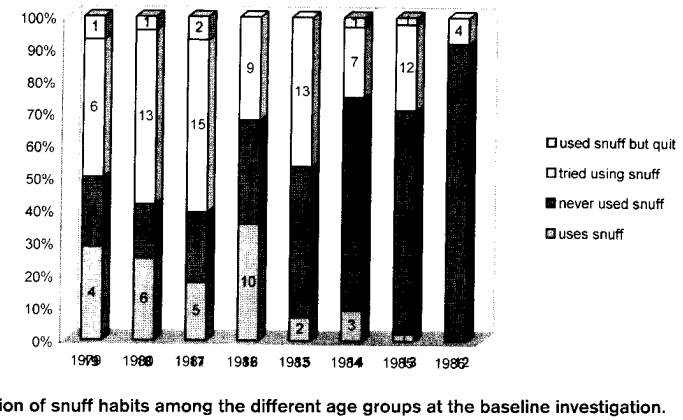

Figure 2. Distribution of snuff habits among the different age groups at the baseline investigation.

same number of boys, 28 (41%), responded that they had never used snuff or that they had tried it. Two of the boys reported that they had quit. At the third evaluation, 13 (13%) of the boys in FBK reported that they currently used snuff, 5 (6%) in FIF and 12 (17%) in GIK. Consequently, only small differences existed concerning the boys' snuff habits between the first and third evaluations and between the clubs.

The distribution of snuff habits at the baseline evaluation in the different age groups is presented in Figure 2. Among the 12-year-old boys, four of the 50 in that age group reported that they had tried snuff; the rest said that they had never tried it. Of the 13-year-olds, one reported that he currently used snuff, one that he had quit using snuff, and 12 that they had tried while 31 had never used snuff. Experiences in using snuff increased in the remaining age groups. The use of snuff was most common in the 16-year-old group where ten reported that they currently used snuff. Two of the 17-year-olds and one 18- and one 19-year-old had quit.

KNOWLEDGE OF TOBACCO AND ITS HARMFUL EFFECTS

In the introductory questions, the boys were to list some of the approximately 4,000 substances found in cigarette smoke. At the baseline evaluation, 78% of FBK's boys listed nicotine, 61% tar, 6% carbon monoxide, and 19% tobacco. Of the boys in FIF and GIK, 73% and 68% respectively responded nicotine, 37% and 35% tar, and 16% and 28% tobacco. Three per cent of the boys in GIK also listed carbon monoxide. Among the FBK and FIF boys, the percentage of correct answers increased at the second evaluation but decreased somewhat at the third. At the third evaluation, the percentage of correct answers given by the GIK boys increased compared with the baseline evaluation.

Concerning the question about naming a few of the 2,000 substances that snuff contains, 66% of FBK's boys answered nicotine, 3% lye, 1% lead, and 11% tobacco. Of the FIF and GIK boys, 56% and 58% respectively responded nicotine and 11% and 16% tobacco. At the baseline investigation, more than half of all the boys responded that snuff contains nicotine. The level of knowledge increased among both the boys in the intervention groups and in the control group at the second and third evaluations compared with the baseline evaluation.

At the baseline evaluation, 60% of FBK's boys responded that there was a correlation between smoking and heart disease and vascular disorders. The same answer was given by 52% of FIF's boys and 55% of GIK's boys. The correlation between the use of snuff and heart disease and vascular disorders was less well known, by only 22% of FBK's boys and by 26% and 17% of FIF's and GIK's boys respectively. That smoking can discolour teeth was known by 84% of FBK's boys and that using snuff can cause gingival recession (exposing the root surface of the teeth) by 52%; 81% and 61% of FIF's boys, respectively, were aware of these facts, as were 71% and 41% of GIK's boys.

At the baseline evaluation, 77% of FBK's boys responded that nicotine affects health, as did 77% and 68% of FIF's and GIK's boys respectively. That the heart beats faster during smoking was known by 26% of FBK's boys and that smoking affects lung capacity by 49%; 22% and 56%, respectively, of FIF's boys were aware of these facts, as were 19% and 43% of GIK's boys.

DIFFERENCE IN KNOWLEDGE AFTER INTERVENTION

Concerning the total score on the knowledge test, the Student's t-test showed that the improvement between the first evalu-

ation (baseline evaluation) and the second evaluation was statistically significant among FBK's boys ($p<0.001$) and among FIF's boys ($p<0.001$) as was the improvement for the same two clubs between the first and the third evaluation ($p<0.001$) and ($p< 0.001$) respectively. Between the second and third evaluation, however, there was a statistically significant decrease in the total number of correct points scored on the knowledge test among both the FBK boys ($p=0.004$) and the FIF boys ($p< 0.001$).

Among the GIK boys, the difference between the first and second evaluation was not statistically significant. The improvement between the first and third evaluation, however, was statistically significant ($p<0.001$) as was the improvement between the second and third evaluations ($p<0.001$). Mean values of the number of correctly answered questions in the different clubs and at the different evaluations can be seen in Figure 3.

DIFFERENCE IN KNOWLEDGE AT THE DIFFERENT EVALUATIONS

The differences in the levels of the total knowledge score between the three clubs at the different evaluations were analysed using the analysis of variance (mean scores are reported in Figure 3). The analysis showed that the interaction between the knowledge scores and time was significant ($p<0.001$). The development in knowledge was therefore significantly dependent on whether or not a player had been given information. The differences between the clubs were also significant at the two latter evaluations. This shows that this difference can be ascribed to the information given to FBK and FIF and that the differences endured over time.

The differences between all the evaluations - the first and second, the second and third, and the first and third – between the control group, GIK, and the two clubs, FBK and FIF, were significant ($p<0.001$). Between FBK and FIF, on the

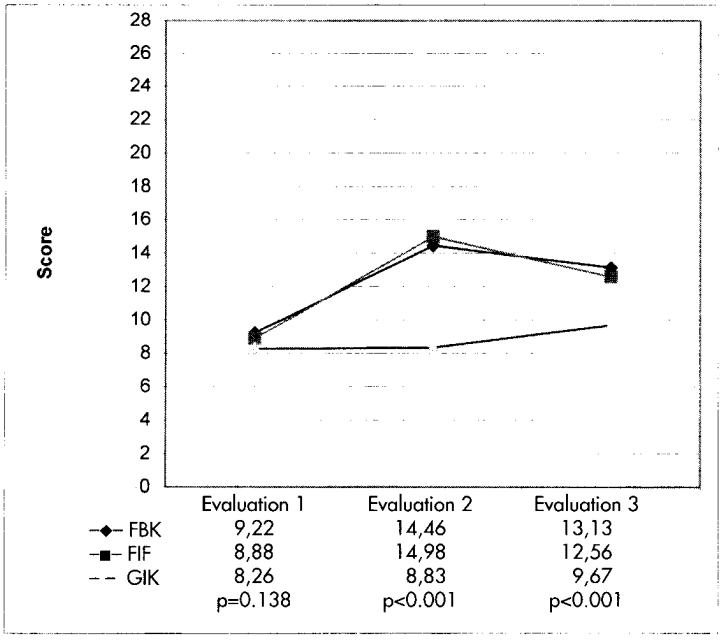

Figure 3. Mean value of the number of correctly answered questions in the different clubs and at the different evaluations.

Table 5. Mean values for the total k
ween snuff users and non-users at
tions.

	Evaluation	
	1	2
Snuff users	9.5	12.4
Non-users	8.8	13.1

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DIFFERENCE IN KNOWLEDGE BETW
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DISCUSSION

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Table 5. Mean values for the total knowledge score between snuff users and non-users at the different evaluations.

	Evaluation		
	1	2	3
Snuff users	9.5	12.4	12.5
Non-users	8.8	13.1	12.0

other hand, the difference between the different evaluations was not significant.

DIFFERENCE IN KNOWLEDGE BETWEEN THOSE WHO USE SNUFF AND NON-USERS

The differences in the levels of the total knowledge scores over time between those who use snuff and non-users were tested using the analysis of variance (mean scores are shown in Table 5). The result shows that there was no significant main effect of the factor use of snuff. There was, however, a significant improvement in the total score for the entire experimental group over time ($p < 0.001$).

DISCUSSION

At the baseline evaluation, no significant differences could be found between the clubs concerning the boys' tobacco habits and knowledge of tobacco and its harmful effects. After the health information, the knowledge of tobacco's harmful effects increased significantly among the boys, but in spite of this, their use of tobacco did not change. Such knowledge also increased significantly among the boys in the control group, but no change in the boys' use of tobacco could be detected here either.

No significant difference could be detected between those boys who use snuff and non-users concerning their knowledge of the harmful effects of tobacco.

The baseline evaluation showed that only one of the boys smoked. On the other hand, a large number of boys reported that they had tried smoking, a higher percentage in GIK than in FBK or in FIF. In a public health report Public health in Värmland, Part 1 (Folkhälsan i Värmland, Del 1, 1990), the results of a questionnaire survey concerning the smoking habits of boys in the ninth grade are presented. The results of the current study agree well with those in the public health report.

In this study on the tobacco habits of ice-hockey-playing boys, snuff habits have a more prominent place than smoking habits. A total of 31 (12%) of the boys used snuff. In FBK, a higher percentage of the boys used snuff compared with FIF and GIK: 14% compared with 6% and 11% respectively. Of the 31 boys, 9 (29%) used more than two tins of snuff a week. In the study conducted *by Bogarve and Andrén-Sandberg* (1996), no mention is made of the number of boys using snuff; on the other hand, the amount of snuff used is reported. The branch of sports that reported a high use of snuff was wrestling. Ten per cent of the boys who wrestled reported that they used more than two tins of snuff a week. In other branches of sports, snuff was used only to a small extent, e.g. 1% in bowling and orienteering and 0% in swimming.

In this study, one 13-year-old reported that he used snuff while 12 (27%) reported that they had tried it. Experience in using snuff increased thereafter in the other age groups. In *Marklund's* study (1989) on the tobacco habits, knowledge, and attitudes of 13-17-year-olds, 3% of the boys reported that they used snuff and 23% that they had tried snuff. The study was conducted in 1987, and compared with the current study, no appreciable differences appear. In a follow-up study by *Marklund & Törnell* (1996) carried out in 1994, 3% of the 13-year-olds reported that they used snuff, as before, while 20% reported that they had tried it, a reduction of 3%.

In the study, The drug habits of school students 1997, the Swedish Council for Information on Alcohol and other Drugs (1998) reported that 17% of the 15-year-olds used snuff. That is pronounced difference compared with the current study where 7% of the 15-year-olds reported using snuff while 36% of the 16-year-olds used snuff.

The boys exhibited good knowledge of certain questions at the baseline evaluation, and the knowledge of the boys in each club did not differ markedly before the intervention. The correlation between smoking and cancer, heart disease, and vascular disorders was relatively well known. Discoloration of the teeth because of smoking was also well known by the boys. It was, however, less well known that heart disease and vascular disorders are also correlated with the use of snuff. Between 40% and 50% of the boys reported that snuff damages the mucous membranes in the mouth and can cause gingival recession, exposing the root surfaces of the teeth. These are effects that many have most likely seen in pictures on different occasions during the dissemination of information, such as during dental and oral health visits. A high percentage knew that nicotine affected health. On the other hand, it was less well known by the boys that the heart beats faster during smoking and that the use of snuff affects lung capacity.

The information given on tobacco and its harmful effects significantly increased the knowledge of the boys in both FBK and FIF while there was no difference in the control group (GIK). With time, the level of knowledge decreased among the boys, which agrees with the literature (*Marton, Dahlgren, Svensson & Säljö,* 1977). One interesting observation was that knowledge increased significantly in the control group GIK, even though it did not reach the level of that in the two other clubs. This increase in knowledge might be explained by the boys' interest in questions that concern the practice of their sport, they may have sought information – alone or together with friends, parents, and coaches - which they later expressed in the questionnaire.

Despite the significant increase in knowledge on tobacco and its harmful effects among the boys, no effect was seen on their use of tobacco. *Aarö, Wold, Kannas, & Rimpelä* (1986) reported in a study that no significant differences could be found between 15-year-old boys or girls who smoked and those who did not smoke concerning their knowledge of the harmful effects of smoking.

This study, which contains knowledge questions of different types, reports, the total knowledge score. The relationship between knowledge and whether the boy used snuff has also been analysed. Marklund (1989) is of the opinion that it is interesting to compare the different questions internally instead of studying the total result. Since personal experiences of tobacco can be important for different types of knowledge, the relationship between knowledge and behaviour ought to be studied in a similar manner.

According to *Marklund* the tobacco-users would deny the harmful effects of tobacco and therefore reject the knowledge. This could be an explanation for why behaviour does not change. However, this study contradicts this since no significant difference in knowledge of the harmful effects of tobacco was found between those who used snuff and those who did not.

Co-operation between people is the basis of activities that successfully promote health and it is important to involve all parties concerned. For people who work daily with children and adolescents, it should be a matter of course to participate in this important health activity.

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lists different measures to use in reducing the use of tobacco both among adolescents and the adult population. Information and support should be goal-oriented and focussed on individuals or groups e.g. adolescents with a high risk of developing a tobacco addiction.

Ice-hockey-playing boys ought to be seen as such a risk group, even though the results of the current study cannot be generalised.

In this sense, it is of interest to study different underlying factors such as the influence of socio-economical relationships with parents, siblings, and friends (*Aarö, Hauknes & Berglund,* 1981, *Marklund,* 1989). One interesting group in particular is those boys who reported that they had tried smoking and/or using snuff and not continued. This group should be the focus of a special investigation on how the use of tobacco is established and then continued or given up.

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