Health-Related Behaviour and School Health Promotion in Estonian School children

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Abstract

Purpose*: The aims of this study were to: give an overview of health related behaviour in Estonian sixth grade schoolchildren; clarify how different domains of health related behaviour are associated with individual (gender, location, and ethnicity) and school-related (application of a Health Promoting Schools approach (HPSA) and health topics covering in school subjects) factors.*

Methods*: Health-related behaviour of randomly selected Estonian 1033 sixth grade students (aged 12.77, S.D. .38 years) were evaluated using web-based questionnaires.*

Results: *Studied factors, like gender, location, ethnicity, health topics covering in lessons were more persistent than HPSA in predicting high risk-taking behaviour in different health related domains by multiple logistic regression analysis.*

Conclusion*: Full implementation of the principles of HPSA, more often covering health topics in lessons, and taking into account factors such as gender, location, and ethnicity when planning health promotion, should increase the efficiency of health promotion in schools.*

Keywords: health related behaviour, gender, location, ethnicity, Health Promoting Schools approach, education

1. Introduction

Many lifestyle related diseases such as ischemic heart disease, HIV/AIDS, injuries and diabetes mellitus are judged to be public health issues worldwide. It is expected that by 2030 the burdens of premature death and disability as a consequence of lifestyle related diseases will increase (Mathers & Loncar, 2006). Unhealthy habits and risk taking behaviour, such as physical inactivity, an unhealthy diet, smoking, drug, and alcohol abuse, risk-taking traffic-, fire-, water-related, and sexual behaviour, evolve primarily during adolescence and influence a people's health for the rest of their life. When compared to other European countries, the health related behaviours of Estonian adolescents are one of the worst regarding physical activity, eating fruits, smoking, drugs and alcohol use (Currie et al., 2012).

Health promotion interventions using ecological approach, focus on the intrapersonal (e.g. knowledge, attitudes, skills), interpersonal (family, peers, school's social environment), institutional (formal and informal rules and regulations), community (relationships with organizations) and public policy factors (laws and policies) which all help to support and maintain healthy behaviour (McLeroy et al., 1988). Many current school programs for promoting health and well-being in schoolchildren are based on an ecological approach.

Health promoting schools initiatives aim to promote health and well-being among pupils, staff and parents in cooperation with and support from the community (Parcel et al., 2000). Intervention studies using a Health Promoting Schools approach (HPSA) have shown to be quite successful in promoting health and well-being via the curriculum integrated with the school's ethos and environment, and collaboration with parents and the community (Lister-Sharp et al., 1999). Few studies, other than intervention studies, however have assessed how successful HPSA is in shaping everyday behaviour of students.

Estonia joined the European Network of Health Promoting Schools (ENHPS) in 1993 (Hansen et al., 2009). Today, about 40% of Estonian schools (approximately 200) belong to the network. The network is coordinated by The National Institute for Health Development, who supports school staff by providing knowhow, training and materials. At the same time all schools, whether ENHPS members or not, are required to do health promotion work as a part of their curriculum (Põhikooli riiklik oppekava, 2011). When implementing the curriculum, teachers can choose between different methods of achieving learning goals that take into account their own knowledge and the materials available.

Many studies have shown that health related behaviour in teenagers is associated with gender [Currie et al., 2017; Morrongiello & Rennie, 1998; Merenäkk et al., 2003; Buhi & Goodson, 2007; Hibell et al., 2012), ethnicity (Currie et al., 2012; Hibell et al., 2012; Amundsen et al., 2005; Monshower et al., 2007; Chen & Jacobson, 2012) and location (urban vs rural) (Levine & Coupey, 2003; Martino et al., 2008; Foulger et al., 2013). Therefore when studying health-related behaviour also gender, ethnicity, and location should be taken into account.

The aims of this study were to gain an overview of the prevalence of health related behaviours of Estonian sixth grade children in different domains of health; to clarify how different domains of health-related behaviour are associated with individual (gender, location and ethnicity) and school (application of a Health Promoting Schools approach and health topics covering in lessons) factors.

2. Methods

2.1. Study sample

This study was carried out during the school year 2012/2013. Sixth grade school children from four of Estonia's largest counties - in the north, south, east and western parts of the country - took part. Data about the schools were obtained from the national educational online database (Eesti Hariduse Infosüsteem [EHI], 2021). Pupils from all the regular schools in the four studied counties constituted a total of 8247 students. In each county schools were divided into three groups: Estonian-based urban schools; Russian-based urban schools; country schools. A two-stage sampling technique was implemented: 1) random selection of schools (primary sampling unit); 2) random selection of a single sixth grade class per school (secondary sampling unit). 52 (of 78 selected schools) schools agreed to participate in the study. Of 1033 sixth grade pupils participated in the study (response rate was 82.6%), 50.1% were male, and mean age was 12.77, S.D. .38 years. From the 52 schools participating in the study 36 (69.2%) were Estonian schools with 699 (67.7% of subjects) studied subjects and 39 (75.0%) were urban schools with 838 (81.1%) subjects. A school's primary language was used as an indication of the ethnicity of students. The school-level questionnaires were filled in by representatives of 43 (82.7%) schools. The Ethics Committee of the Faculty of Medicine, University of Tartu, approved this study.

2.2. Procedure

This article handles the outcomes of the study Health Promotion Effectiveness in Estonian Schools. Student and teacher questionnaires, and focus group interviews with school staff, were used to ascertain how individual, social, environmental and school-based factors influence adolescents' health related behaviour. This current article focuses only on the main results from the student and teacher questionnaires, our other findings will be described in future papers. Most (85%) of the students filled in the web-based questionnaires (in cases of technological malfunctions, students used paper forms). In order to avoid overloading the students, the questionnaires were administered classroom-wide during five separate 45 min sessions. Students' health related behaviour was assessed for the following domains: nutrition; physical activity; traffic-, fire- and water-safety; smoking, alcohol and drug abuse; sexual behaviour. Questions about student's socio-economical background, health status, personality and perceptions of the school's environment were also included. When pupils filled in the questionnaire, only a study assistant was in the classroom. The study assistant explained the aim and procedure of the sessions and if needed answered pupil's questions. After the last questionnaire session, students were given a gift to thank them for their participation. Unique codes were used instead of the names on the questionnaires to ensure pupils' confidentiality. The answers from all the student questionnaires were combined to form a unified database.

The school level questionnaire was delivered by email. Each school was given a unique code. The questionnaire was divided into nine parts and included questions to the governing board and to a sixth grade teacher. Questions about how the Health Promoting Schools approach was applied, as well as how the school promoted the following domains such as: nutrition; physical activity; traffic-, fire- and water-safety; smoking, alcohol and drug abuse; sexual behaviour. Each part of the questionnaire was answered by the most competent school representative (e.g. the school director, head teacher, representative of the health council, class teacher, subject teacher, or extracurricular organizer).

2.3. Student questionnaire

The student questionnaire covered nine health related domains: nutrition; physical activity; traffic-, fire- and water-safety; smoking, alcohol and drug abuse; sexual behaviour. Items measuring health related behaviour and the corresponding coding systems are described in Table 1. The students were asked to estimate their behaviour during the previous 12 months. When health related behaviours were measured using more than one question (e.g. nutrition, physical activity, traffic- and water-safety), a mean score of coded responses was calculated. In the coding, healthier behaviour got a higher value. Students were divided into high risk and low risk groups based on their behaviour scores for each domain. Cut-off points for group membership were determined on the basis of the 25th percentile value of respective health behaviour score, so that students with scores below the 25th percentile value were assigned to the high risk group and vice versa as previously done (Eensoo et al., 2007). For fire safety, all subjects who played with matches often or very often were assigned to the high risk group. For substance use, respondents who reported that they never use substances were included into the low risk group, with all other students assigned to the high risk group. The high risk group in sexual behaviour included students who had unprotected sex during their first and/or last intercourse. There were also questions regarding whether individual health related topics had been covered during lessons. If respondents reported that a health topic had been covered "sometimes" to "very often" in lessons, the answers were coded to "health topic has been covered" (1); and "no" or "I don't know" response was coded to the respective health topic having been "not covered" (0). The questionnaires did not include questions regarding whether drugs use and sexual behaviour had been covered in lessons, because these topics in this age group have not included to curricula yet (Põhikooli riiklik õppekava, 2011).

Table 1. Student-level items used to measure health related behaviour

Domain	Description of items and coding
Nutrition (4 items, Cronbach alpha .60)	Frequency of eating different food products, such as 1) fruits and berries, 2) vegetables, 3) fast food, 4) milk and other dairy products [2]. Participants responded on a seven-point scale ranging from "never" (1) to "several times a day" (7). The eating of fast food was scored in the opposite direction, from "several times a day" (1) to "never" (7).
Physical activity (3 items, Cronbach alpha .64)	Frequency of moderate to vigorous physical activity (MVPA) per week, in your free time outdoors, and for at least 60 minutes a day [2]. Participants responded on a five-point scale ranging from "rarely or never" (1) to "every day" (5).
Traffic safety (7 items, Cronbach alpha .70)	Frequency of car seat belt use in front and back seats, use of a reflector while moving on streets and roads during darkness, use of crosswalks on the way to school or in the local area, use of a helmet when cycling and motorbike riding, and motorbike racing with cars in traffic [19]. Participants responded frequency of activity on a five-point scale ranging from "never" (1) to "always" (5). The item about racing with cars when motorcycling was scored in the opposite direction, from "always" (1) to "never" (5). Additional response indicating no participation in a measured activity were not included in the traffic behaviour score (e.g. do not move in darkness in the street or do not ride by motorbike).
Fire safety (1 item)	Frequency of playing with matches was answered on a five-point scale from "very often" (1) to "never" (5) [20].
Water safety (3 items¸ Cronbach alpha .73)	Frequency of swimming in seasonal time, in deep water, beyond the buoys and diving in head first were answered on a five-point scale from "very often" (1) to "never" (5) [21].
Using of substances	Frequency of using tobacco products, alcohol, and drugs was estimated separately on a five-point scale from "every day" (1) to "never" (5) [9].
Sexual behaviour (2 items)	Use of a condom during first and last intercourse [2] was coded "no" or "do not remember" (0) and "yes" (1).

2.4. Teacher questionnaire

The questions were composed according to the HPSA strategy (Parcel et al., 2000) to determine how this strategy was applied at each school. Answers of nine items were standardised from 0 to 1, with 1 being the positive answer (Table 2). The overall HPSA score for a school was calculated by the sum of these nine items (mean 6.08, S.D. = .35, range 0 to 9). On the basis of the 75th percentile value (7.75) of the obtained scores, schools were divided into two groups: 1) high-HPSA scoring (n=10) and 2) low-HPSA scoring (n=33). Of the 10 high-HPSA schools, 7 belonged to the ENHPS; of the 33 low-HPSA schools, 14 belonged to the ENHPS.

Table 2. School level items describing the application of HPSA strategy

Item wording and coding
1. In which documents are your school's health promotion regulated? Response options were "school's development plan", "school's curriculum", "school's house rules", "strategic plan or action plan for school health promotion". For each document, .25 points was scored, with the maximum score for this item of 1 point.
2. Is there a health council or health personnel in your school that coordinates health promotion work? Response options: "yes" (1 point), "no" (0).
3. How often does the health council get together? Response options: "at least every month" (1 point), "four times a year" (.75), "two times a year" (.5), "irregularly" (.25), "never" (0).
4. The health council analyses the efficiency of their work? Response options: "yes" (1 point), "no" (0).
5. The results of this analysis are considered when planning future activities? Response options: "yes" (1 point), "no" (0)
6. Suggestions made by the health council are considered in the decision making of the school? Response options: "yes, always" (1 point), "from time to time" (.5), "no" (0).
7. In your opinion, is the health council's work effective? Response options: "yes" (1 point), "no" (0).
8. The health council collaborates with all parties related to the school e.g. students, parents, school staff)? Response options: "always" (1 point), "from time to time" (.5), "does not collaborate" (0).
9. The health council collaborates with other organizations in the school district? Response options: "always" (1 point), "from time to time" (.5), "does not collaborate" (0).

2.5. Statistical analysis

For the descriptive statistics, the frequency of answers was presented as the number of respondents and percentages. Continuous variables were described using the mean and standard deviation (S.D.). Simple logistic regression analysis was used to assess how each independent variable associated with students' risk behaviour regarding different topics. Multiple regression analysis was used to clarify adjusted associations in respective topics of health related behaviour. Results were provided as odds ratios and 95% confidence intervals.

For statistical analyses, SPSS 20 software (IMB Statistics) was used. Values of $p<.05$ were considered statistically significant.

3. Results

Table 3 provides an overview of the health related behaviour of Estonian sixth grade students in the domains of nutrition; physical activity; traffic-, fire- and water-safety; smoking, alcohol and drug use; sexual behaviour.

Table 3. **Health related behaviour in Estonian sixth grade schoolchildren**

Healthrelated behaviour	N	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Nutrition		Never	Less than once a week	Once a week	2-4 days a week	5-6 days a week	Once a day	Several times a day
Eating fruits and berries	890	29 (3.3)	44 (4.9)	72 (8.1)	270 (30.3)	174 (19.6)	150 (16.9)	151 (17.0)
Eating vegetables	874	22 (2.5)	51 (5.8)	92 (10.5)	287 (32.8)	180 (20.6)	141 (16.1)	101 (11.6)
Eating fast food	882	67 (7.6)	522 (59.2)	157 (17.8)	90 (10.2)	23 (2.6)	10 (1.1)	13 (1.5)

Eating dairy products	892	21 (2.4)	28 (3.1)	39 (4.4)	126 (14.1)	173 (19.4)	256 (28.7)	249 (27.9)
Physical activity		Rarely or never	1-2 times a week	3-4 times a week	Almost every day	Every day		
MVPAper week	956	23 (2.4)	163 (17.1)	441 (46.1)	219 (22.9)	110 (11.5)		
MVPA at least 60 minutes a day	906	98 (10.8)	212 (23.4)	293 (32.3)	190 (21.0)	113 (12.5)		
MVPAin your free time outdoors	893	269 (30.1)	279 (31.2)	155 (17.4)	128 (14.3)	62 (6.9)		
Traffic behaviour		No activity	Never	Rarely	Occasionally	Almost always	Always	
Using a seat belt in front seat	849	8 (.9)	3 (.4)	9 (1.1)	26 (3.1)	80 (9.4)	723 (85.2)	
Using a seat belt in back seat	846	7 (.8)	5 (.6)	23 (2.7)	52 (6.1)	125 (14.8)	634 (74.9)	
Wearing a helmet when cycling	839	38 (4.5)	103 (12.3)	91 (10.8)	159 (19)	219 (26.1)	229 (27.3)	
Wearing a helmet when motorcycling	819	488 (59.6)	29 (3.5)	21 (2.0)	37 (3.6)	59 (5.7)	185 (22.6)	
Racing with cars in traffic when motorcycling	811	498 (61.4)	170 (21.0)	70 (8.6)	34 (4.2)	15 (1.8)	24 (3.0)	
Using crosswalks on the way to school or in the local area	841	102 (12.1)	20 (2.4)	39 (4.6)	124 (14.7)	258 (30.7)	298 (35.4)	
Using a reflector while moving on streets and roads in darkness	711	22 (3.1)	29 (4.1)	55 (7.7)	117 (16.5)	244 (34.3)	244 (34.3)	
Fire safety		Never	Rarely	Occasionally	Often	Very often		
Playing with matches	903	408 (45.2)	231 (25.6)	132 (14.6)	71 (7.9)	61 (6.8)		
Water safety		Never	Rarely	Occasionally	Often	Very often		
Swimming in deep water	904	69 (7.6)	82 (9.1)	165 (18.3)	258 (28.5)	330 (36.5)		
Swimming beyond the buoys	886	337 (38.0)	176 (19.9)	183 (20.7)	91 (10.3)	99 (11.2)		
Diving in head first	898	303 (29.2)	158 (15.2)	144 (13.9)	141 (13.6)	152 (14.7)		
Using of substances		Never	Some times a year	1-2 times a month	1-2 times a week	Every day		
Tobacco products	890	820 (92.1)	36 (4.0)	15 (1.7)	11 (1.2)	8 (.9)		
Alcohol	902	660 (73.2)	194 (21.5)	36 (4.0)	8 (.9)	4 (.4)		
Drugs	885	864 (97.6)	8 (.9)	9 (1.0)	0 (.0)	4 (.5)		
Sexual behaviour		No/do not remember	Yes					
Used condom during first intercourse	33	18 (54.5)	15 (45.5)					
Used condom during last intercourse	34	21 (61.8)	13 (38.2)					

MVPA- moderate to vigorous physical activity

Student respondents were divided into high and low risk groups according to their health related behaviour concerning various health related domains: nutrition (high n=181, low n=714), physical activity (high n=212, low n=800), traffic-safety (high n=194, low n=657), fire-safety (high n=132, low n=771), water-safety (high n=205, low n=703), smoking (high n=70, low n=820), alcohol use (high n=242, low n=660), drug use (high n=21, low n=864) and sexual behaviour (high n=22, low n=12).

Simple logistic regression analyses revealed (Table 4) that schoolchildren of low-HPSA schools had higher odds of belonging to high risk group in use of tobacco products and alcohol use when compared to the respective low risk groups. When the students reported that respective health related topics have not been covered in the lessons then they had higher odds of belonging to high risk group in the domains of nutrition, traffic-, water-safety and smoking. Boys had significantly higher odds of belonging to high risk group in the domains of nutrition, fire- and water-safety when compared to the respective low risk groups. Rural schoolchildren had higher odds of belonging to high risk group in use of tobacco products and alcohol use, but lower odds of belonging to high risk group of sexual behaviour when compared to the respective low risk groups. Russian-speaking pupils had higher odds of belonging to high risk group in domains of nutrition, physical activity, traffic-safety, and sexual behaviour, but lower odds of belonging to high risk group in alcohol use when compared to the respective low risk groups.

Table 4. Variables predicting students' high risk behaviour in different domains of health

Health-related behaviour	Odd ratio (95% CI)				
	Low-HPSA vs high-HPSA	Not covering vs covering health topic in lessons	Gender (boys vs girls)	Location (rural vs urban)	Ethnicity (Russian vs Estonian)
Nutrition	.87 (.58-1.33)	**2.16 (1.51-3.10)**	**1.93 (1.38-2.70)**	.88 (.58-1.35)	**1.71 (1.22-2.40)**
Physical activity	1.26 (.82-1.91)	1.29 (.93-1.79)	.79 (.58-1.07)	1.17 (.80-1.71)	**1.68 (1.23-2.29)**
Traffic safety	.60 (.45-1.03)	**2.07 (1.48-2.90)**	1.23 (.89-1.70)	.66 (.42-1.04)	**2.41 (1.74-3.35)**
Fire safety	1.56 (.90-2.71)	1.53 (.97-2.39)	**2.11 (1.44-3.09)**	1.22 (.78-1.91)	1.13 (.77-1.68)
Water safety	1.27 (.83-1.94)	**1.59 (1.09-2.32)**	**1.77 (1.29-2.43)**	.84 (.56-1.27)	.79 (.56-1.11)
Use of tobacco products	**2.62 (1.10-6.23)**	**1.80 (1.03-3.15)**	1.17 (.72-1.92)	**1.79 (1.03-3.09)**	.74 (.42-1.31)
Use of alcohol	**1.53 (1.03-2.28)**	1.20 (.83-1.75)	.90 (.67-1.21)	**1.88 (1.32-2.67)**	**.42 (.29-.61)**
Use of drugs	3.96 (.51-30.63)	-	.78 (.33-1.87)	1.33 (.48-3.69)	2.17 (.91-5.18)
Sexual behaviour	7.00 (.60-81.68)	-	1.27 (.18-8.87)	**.10 (.01-.99)**	**6.80 (1.43-32.37)**

Statistically significant ($p<.05$) differences compared to the respective low risk groups are in bold
HPSA - Health Promoting Schools approach

For clarifying associations between health related domains and adjusted studied variables (application of a HPSA, health topics covering in lessons, gender, location and ethnicity), multiple logistic regression analyses were carried out (Table 5). In the models of nutrition, physical activity, traffic- and fire-safety the same variables predicted higher risks as in simple logistic regression analyses. In the model of water-safety the variable covering the topic water-safety in lessons did not reveal (in contrast to the results of simple logistic regression analysis), but gender and ethnicity revealed (last one in contrast to the results of simple logistic regression analysis) as significant predictors of higher risk. Boys had higher and Russian-speaking pupils had lower odd of belonging to high risk water-safety group when compared to low risk group. In the model of smoking only location revealed as significant predictor of high risk; rural students had higher odd of belonging to high risk group compared to low risk group. In the model of alcohol use revealed significant associations with variables: topic of alcohol use covering in lessons, location, and ethnicity; not covering the topic of alcohol use in lessons and rural location predicted higher odd and Russian ethnicity lower odd of belonging to high risk group. Drug use and sexual behaviour did not associate significantly with any adjusted variables in multiple logistic regression analyses.

Table 5. Multiple logistic regression models indicating students' high risk behaviour in health related domains

Health-related behaviour	Adjusted odd ratio (95% CI)				
	Low-HPSA vs high-HPSA	Not covering vs covering health topic in lessons	Gender (boys vs girls)	Location (rural vs urban)	Ethnicity (Russian vs Estonian)
Nutrition	.85 (.01 -1.36)	**1.57 (1.02-2.40)**	**2.26 (1.47-3.47)**	1.07 (.61-1.87)	**1.89 (1.19-3.01)**
Physical activity	1.40 (.89-2.22)	1.37 (.95-1.99)	.74 (.51-1.07)	1.45 (.89-2.37)	**2.35 (1.53-3.59)**
Traffic behaviour	.85 (.54-1.33)	**1.93 (1.31-2.84)**	1.16 (.79-1.70)	1.09 (.63-1.89)	**2.67 (1.75-4.07)**
Fire safety	1.40 (.77-2.56)	1.63 (.96-2.77)	**1.97 (1.23-3.15)**	1.30 (.74-2.29)	1.05 (.59-1.88)
Water safety	1.32 (.81-2.16)	1.16 (.75-1.80)	**1.78 (1.20-2.64)**	.73 (.44-1.22)	**.53 (.32-.90)**

Using of tobacco products	2.20 (.91-5.32)	1.54 (.81-2.91)	1.36 (.76-2.45)	**2.48 (1.28-4.79)**	1.05 (.47-2.34)
Using of alcohol	1.46 (.95-2.23)	**1.70 (1.10-2.63)**	.90 (.64-1.27)	**1.82 (1.20-2.74)**	**.49 (.31-.78)**
Using of drugs	4.24 (.53-33.75)	_	.65 (.21-2.02)	3.48 (.91-13.22)	2.78 (.68-11.38)
Sexual behaviour	10.09 (.71-142.73)	_	1.31 (.08-21.38)	.35 (.01-8.37)	3.28 (.40-26.84)

Statistically significant ($p<.05$) differences compared to the respective low risk groups are in bold
HPSA - Health Promoting Schools approach

4. Discussion

This study found that Estonian sixth grade students are quite unhealthy. Their fruit consumptions and physical activity are low, and substances (tobacco, alcohol, drugs) abuse levels are high. These results are similar to the Estonian results of the Health Behaviour in School-aged Children (HBSC) study, both are worse compared to the 38 other European countries included in the HBSC study (Currie et al., 2012). In this study, 3% of students reported having sexual intercourse and 65% of them had not used a condom. In the HBSC study of 15 year olds, condom use was 90% in Estonia and it was the highest of the 39 studied countries (Currie et al., 2012). These results indicate that HIV prevention work in Estonian schools has been effective for students in the later adolescence period, but our findings suggest that this intervention should start much earlier, at least among children at higher risk. In our study sixth grade pupils used seat belts more frequently and behaved more safely as pedestrians compared to 15 year old Estonian students (Eensoo et al., 2007). Teenagers' use of safety belts has been shown to be less frequent than for younger children (Glassbrenner et al., 2004). According to our study, helmet use when cycling and motorcycling was lower compared to the students in Sweden in 2002, however helmet use in Sweden was voluntary (Nolén et al., 2005) and in Estonia it has been mandatory for children up to the age of 15 to wear a helmet whilst cycling since 2011 (Liiklusseadus, 2021). Although helmet use can be increased with legislation (Dellinger & Kresnow, 2010), the role of schools and traffic safety campaigns directed at young people are still important for raising helmet use (Nolén et al., 2005). In our study more than half of the students had played with matches. Reviews of match use by children (Kolko et al., 2006; Fessler, 2006) have shown that 44-70% of respondents reported playing with matches during childhood. It has been recognized that when teenagers play with fire, the attraction is less to the fire itself, but rather in disobeying rules outside of adult supervision. As an overestimation of their own skills to deal with fires can lead to unwanted consequences (Fessler, 2006), it is important to pay more attention to fire safety prevention in schools.

Although it is known that HPSA should be effective in promoting healthy behaviour in schools (Lister-Sharp et al., 1999), this present study revealed that implementation of the principles of HPSA, even in ENHPS schools, were on very different levels (about 40% ENHPS schools belonged to group of the no-HPSA schools). Comparison of different health promoting institutions is quite difficult, because all institutions (e.g. the school) are unique and doing prevention work their own way they should take into account the risk assessment of their own institution (Green et al., 2000). Therefore it is remarkable that we found the positive association between HPSA and no-use of tobacco products and alcohol. The reason might be that tobacco and alcohol use has a high impact on the burden of disease and injuries and tobacco and alcohol use preventions are highlighted on the political level (Lai et al., 2007), and also all studied schools have reported the high priority of tobacco and alcohol use prevention (data not shown). It seems that implementing HPSA strategies would be effective in preventing risk taking behaviour in other spheres of health, if they were given higher priority.

The results of our study clearly showed that pupils who reported that health related topics were handled more frequently in lessons, belonged more likely to the low risk group regarding health behaviour domains of nutrition, traffic behaviour and alcohol use. This might reflect that teachers' knowledge, available materials and teaching methods for educating students about nutrition, traffic behaviour and alcohol misuse are more effective than for the promotion of healthy behaviours in other spheres of health. Although all teachers are required to do health promotion as part of the curriculum (Põhikooli riiklik õppekava, 2011) from our results we could conclude that teachers' knowledge about some health related topics is quite low or the teaching methods used are ineffective. However it seems that covering health topics in lessons have not been sufficient for preventing high risk behaviour (e.g. in domains of physical activity and fire safety), therefore additional methods such e.g. HPSA (Lister-Sharp et al., 1999) should be used to ameliorate high risk behaviours.

This study revealed that compared to girls, boys generally exhibited higher risk-taking behaviour in the domains of nutrition, fire-, and water-safety. Fessler (Fessler, 2006) reviewed the available evidence and also found that males are more likely to have played with fire during childhood. Similar to our study, McCool with colleagues (McCool et al., 2009) found males to take higher risks regarding swimming compared to females. In our study boys had a higher

physical activity mean score than girls (data not shown), which was similar to the findings of HBSC Study (Currie et al., 2012), but after composing risk groups the significant difference between the gender did not reveal. Boys' unhealthier behaviour regarding nutrition has also been observed in HBSC Study (Currie et al., 2012). As a healthy diet and sufficient physical activity are well known factors in preventing obesity and several chronic diseases, gender differences should be taken into account when planning nutrition and physical activity interventions at schools, e.g. teach boys how to prepare healthy food and afford girls more opportunities to be physically active.

This current study of sixth grade pupils did not reveal gender differences in substances and condom use. Previous studies have shown that boys have been found to use substances (tobacco, alcohol and drugs) more often than girls (Merenäkk et al., 2003; Hibell et al., 2012), and boys in about one third of 26 other European countries in HBSC Study used condoms more often during intercourse (Currie et al., 2012) than girls. This study in sixth grade pupils did not show gender differences regarding risk-taking traffic behaviour. A previous study of 15 year old Estonian pupils also found no gender differences for behaviour as a pedestrian and seat belt use, but boys more often rode a motorbike and raced whilst riding a motorbike or bicycle (Eensoo et al., 2007). Males take more risks regarding potential injuries, because compared to girls they believe they are less vulnerable to injury (Morrongiello et al., 2010) and therefore underestimate the risk. Our study suggests that gender should be taken into account primarily in health promotion in the domains of nutrition, water- and fire safety.

In this study the location predicted more persistent (on the base of multiple logistic regression analyses) tobacco and alcohol use of students, and in simple logistic regression analysis also sexual risk-taking behaviour. Rural schoolchildren used more often tobacco products and alcohol, but had more rarely unprotected sexual intercourse when compared to urban peers. Comparisons of our results with other studies showed inconsistencies. Foulger with colleagues (Foulger et al., 2013) found that tobacco use, alcohol use and sexual activity were higher among urban students. Martino with colleagues (Martino et al., 2008) found similar results to our study, with adolescents living in rural areas drinking and smoking more frequently if compared with adolescents living in urban areas. However, from the results of this study it can be concluded that a school's location should be taken into account when promoting healthy behaviour, especially in the spheres of substance abuse and sexual intercourse.

A school's primary language was used as an indication of the ethnicity of students. As Russians account for about 25% of the total population of Estonia (Estonian Statistical Database, 2021) then they are a minority. In this study students of Russian-speaking schools had higher health risk in the spheres of nutrition, physical activity, traffic safety and sexual behaviour (the latter only on the basis of a simple logistic regression analyses) compared to the students of Estonian-speaking schools. Other studies have described minority groups as being more vulnerable regarding nutrition, physical activity (Bayne, 1999; Kumanyika, 2006; Yan et al., 2011; Blackstone & Herrmann, 2014), traffic safety (Laflamme & Diderichsen, 2000) and sexual behaviour (Bayne, 1999). Such a difference might reflect the minority's social and political status within a given environment and time period (Kumanyika, 2006; Juarez et al., 2006). Based on our results we suggest that Russian-speaking schools should pay more attention to the promoting healthy behaviour in the spheres of nutrition, physical activity, traffic behaviour and sexual behaviour. The Russian speaking ethnic minority group was less likely to use alcohol if compared to Estonian speaking ethnic majority group. Studies of youths in the Netherlands, Norway and Spain have also shown that ethnic minority groups had significantly better alcohol use patterns (Amundsen et al., 2005; Monshouwer et al., 2007; Chen & Jacobson, 2012). Heath and colleagues (Heath et al., 1999) have described an ethnic minority group as having greater religious involvement and higher values, and therefore less likely to engage in substance abuse.

In conclusion our study suggests that full implementation of the principles of HPSA, more often handling health topics in lessons and taking into account factors such as gender, location and ethnicity when planning health promotion, should increase the efficiency of health promotion in schools.

5. Implications and Contribution

Results of this study of randomly selected Estonian students suggests that complete implementation of HPSA principles, covering health topics in lessons and taking into account factors such as gender, location and nationality when planning health promotion, should increase the effectiveness of health promotion in schools.

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