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Effect of national recommendations on the sale of sweet products in the upper level of Finnish comprehensive schools

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***Interventions*:** In 2007, the Finnish National Board of Education (FNBE) and the National Public Health Institute (KTL) recommended to schools that they quit regular selling of candies and soft drinks. ***Objective*:** The aim of this study was to determine how and why such selling changed from 2007 to 2008 after the national recommendation. ***Methods*:** Surveys were conducted using online questionnaires to all upper comprehensive schools in Finland. In 2007, 480 (49%) and in 2008, 507 (51%) schools answered the questionnaire; 319 (32%) schools participated in both studies. Schools were asked whether they sold candies, soft drinks or other sweet products and, if they had changed the selling of these products, why. The changes in selling were analyzed by using McNemar´s test. ***Results*:** Of the responding schools, 56% (n=267) and 46% (n=233) sold sweet products in 2007 and 2008, respectively. Of the schools responding both years, 56% reported selling sweet products in 2007 and 50% in 2008. Selling had decreased by 11% among the schools that took part in both studies. The main reasons stated for quitting selling these products were concern about pupils' health (40%) and the recommendation of the FNBE and KTL (38%). ***Conclusions*:** The national recommendation was followed by some decrease in sale of sweet products. For further progress, new actions, both policy measures and broader public involvement, may be needed.

Keywords: health promotion, children, sweets, soft drinks

Introduction

Frequent consumption of sweet products forms a common risk factor for many health problems, such as dental caries and obesity, which have increased concern not only in high-income countries but also in middle- and low-income countries (Sheiham and Watt, 2000; Petersen, 2009; WHO 2008). Many international strategies, such as World Health Organization's (WHO) "Global Strategy on Diet, Physical Activity and Health", European Union's "White Paper on a Strategy for Europe on Nutrition, Overweight and Obesity related health issues" and the "Nordic Plan of Action on better life through diet and physical activity", outline solutions to the obesity problem (EC, 2007; NCM, 2006; WHO, 2003a). Children's wellbeing is also one of the main targets of the Finnish Government's Health 2015 public health programme (MSAH, 2001). Tackling problems caused by sweet consumption must involve different sectors of the society (Sheiham and Watt, 2000). According to the WHO's Global School Health Initiative, health-promoting schools should include appropriate nutrition, food services, community relationships and collaboration between school and parents, among other things (WHO, 1998).

During the school years, a child develops lifelong behaviors, beliefs and attitudes related to health in general including oral health. Thus schools provide an important environment for promoting children's and adolescents' oral health, but are also an environment where unhealthy behaviors may be developed (WHO, 2003b). The school system reaches the whole age group better than any other organization (WHO, 2003b). This is the case especially in Finland where, because free basic education is compulsory for all, 99.7% of adolescents complete comprehensive school and over 98% of these schools are run by the municipality (FNBE, 2004). Schools offer a free, warm, nutritious and healthy lunch to all pupils every school day (EC, 2009). The Finnish National Nutrition Council monitors and improves the nutritional situation in the schools by issuing dietary guidelines. Every municipality is also obliged to draw up their own plan for pupils' welfare (FNBE, 2008). School also has an important integrative role in the community (WHO 2003b). Many Finnish schools have pupils' and parents associations as well as management boards, whose main task is to promote cooperation within the school and between the school, parents and local community (EC, 2009).

Even with these policies, co-operation and free school lunches, vending machines and candy shops have become common in Finnish upper level comprehensive schools. In lower level comprehensive schools there is no such regular selling. Selling candies and soft drinks in school attracts pupils, especially when these products are advertised, for example, on vending machines (Harris *et al*., 2009). Selling sweet products is against the healthy environment defined in the Ottawa Charter, especially because children in Finland are obliged to study in this publicly funded environment (FNBE, 2004; WHO, 1986).

Selling sweet products in school is a problem worldwide and more than 30 countries have tried to limit the availability of soft drinks in school (Hawkes, 2010). These government led efforts take many forms. Most, such as the program in the United States, work at both national and municipal levels (Hawkes, 2010).

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In the United Kingdom the government has reformed school food systems and while selling sweet products in schools is prohibited by law as a part of The School Food Trust programme (Matthews *et al*., 2008; School Food Trust, 2007).

The battle is not led by government everywhere. The Swedish Dental Association's "Dentists against sweets and soft drinks" campaign has achieved excellent results by decreasing the percentage of schools selling sweets and soft drinks from 58% to 10% from 2004 to 2007 (SDA, 2008). In Thailand, local Sweet Enough Networks are fighting against sugar products in school (Hawkes, 2008) and in Brazil, some states, have prohibited schools selling soft drinks by law (Gabriel *et al*., 2009). Only few countries, such as Canada, have less-binding guidance or just recommendations concerning sweets and soft drinks in school (Hawkes, 2010).

In Finland the first survey on school sales of candies and soft drinks was made in spring 2007. At the same time the Finnish National Board of Education (FNBE) and the National Public Health Institute (KTL, National Institute for Health and Welfare, THL since 2009), published an announcement in which they recommended that schools quit regular selling of sweet products on their premises. The announcement itself and the release of the first study results received considerable publicity.

The aim of this study was to ascertain how and why the selling of sweet products in Finnish upper level of comprehensive schools changed from 2007 to 2008 after the national recommendation. Another objective was to determine, whether there were differences between schools in this respect.

Material and methods

This study was implemented by the University of Oulu in co-operation with FNBE and KTL in 2007 and 2008. The study population consisted of the upper level of comprehensive schools in Finland, where there are almost 200,000 pupils aged 13 to 16 years.

All 985 (988 in 2007) schools were sent an email, in which the person responsible for selling sweet products was asked to answer a online questionnaire, including 34 questions and taking approximately fifteen minutes. There were both open-ended and categorized questions in the questionnaire with some of the categorized questions inviting more than one response. The most common responder was the school principal. In 2007, two and in 2008 three reminders were sent. In 2007, 480 (49%) and in 2008, 507 (51%) of all Finnish upper comprehensive schools responded; 319 (32%) schools participated in both studies.

Schools were asked if they sold candies, soft drinks, other sweet products or healthy products in a vending machine, tuck shop, café or canteen. Other sweet products included sweet juices, cakes, doughnuts and cookies. Schools that reported not selling sweet products were asked for the reason. Healthy products were also defined, for example, fruits, sandwiches and milk products. Schools that reported selling some of these products were asked the most important reason for these sales. Schools were asked to report any changes in the sales of these products during the previous year and why. Schools with vending machines were asked if brands were marked on the machines. A new variable "selling sweet products" was created and defined as selling at least one of candies, soft drinks and other sweet products.

The number of pupils in the school, the province and the teaching language (Finnish, Swedish) were used as background variables. Statistical significances between the schools according to background variables were analyzed using a Chi-square test. The changes from 2007 to 2008 in selling sweet products, candies, soft drinks, other sweet products and healthy products were analyzed using McNemar's test.

Results

Of all the responding schools, 56% (n=267) and 46% (n=233) sold sweet products in 2007 and 2008, respectively. Of the schools responding both years (n=319), 56% (n=179) reported selling sweet products in 2007 and 50% (n=160) in 2008. Selling had decreased by 11% among the schools that took part in both studies ($p=0.022$)(Figure 1).

The two main reasons for ceasing sales of all sweet products among schools taking part in both studies were concern about pupils' health and the recommendations of FNBE and KTL (Table 2). There were no differences between schools that reported the national recommendation as a main reason, according to number of pupils, province or teaching language.

Selling of candy had decreased by 23% ($p<0.001$) and selling of soft drinks by 20% ($p=0.028$) among the schools that had participated in both studies while the selling of other sweet products did not change. Selling healthy products had increased by 15% ($p=0.005$) among these schools (Table 1).

During both years candies were most often sold in the school's tuck shop and soft drinks in a vending machine. Other sweet products were all sold tuck shops, cafés and canteens. During the one year follow-up the fall in the percentage of schools selling any sweet products via vending machines was the most obvious change (Figure 2). The branding of the vending machines had disappeared in 33% (n=14) of the schools that sold soft drinks in vending machines both years (n=58, $p<0.001$).

Among the schools taking part in both studies, larger schools more often sold sweet products and healthy products than did schools with fewer pupils ($p<0.001$, Table 3). Larger schools had more often made changes for the better in terms of selling sweet products. For example, 26% (n=15) of the schools with more than 500 pupils had quit selling soft drinks, whereas none of the schools with 100 pupils or fewer had done so. There were no statistically significant differences in selling sweet products according to the teaching language or the province of the school.

Of the schools that responded both years, 42% (n=133) reported that they had changed selling in some way during the previous year. The most popularly reported actions were to quit selling or to reduce the sales of sweet products, to limit the opening hours of the sales places or to begin to supply healthy products. There were no differences among these according to number of pupils, province or teaching language. Schools tended to overstate their change in selling behavior.

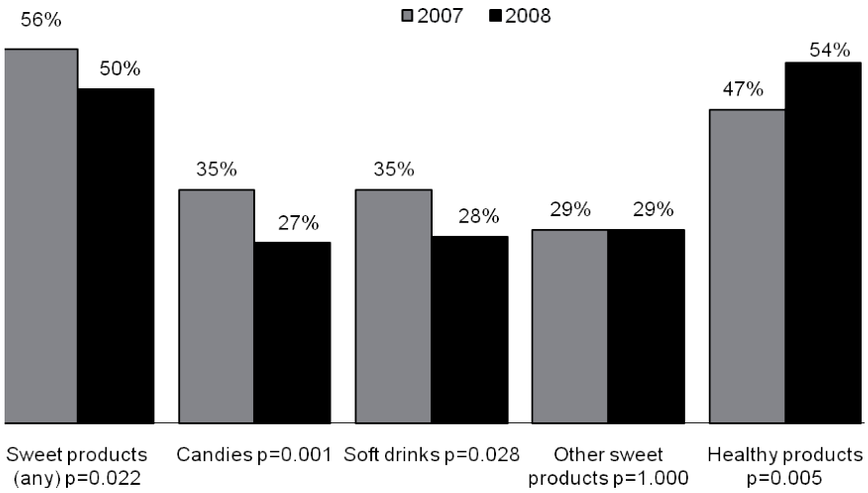

Figure 1. *Selling of sweet products (any), candies, soft drinks, other sweet products and healthy products (%) in 2007 and 2008 in the schools that took part in both studies (n=319).*

Table 1. Percentage of schools selling sweet products (any), candies, soft drinks, other sweet products and healthy products in 2007 and 2008 for schools responding in both years, in 2007, in 2008, only in 2007 and only in 2008.

Group	*Year*	*Sweet products (any)*	*Candies*	*Soft drinks*	*Other sweet products*	*Healthy products*
Answered both years (n=319)	2007	56	35	35	29	47
Answered both years (n=319)	2008	50	27	28	29	54
Answered only '07 (n=161)	2007	55	32	33	27	42
Answered only '08 (n=188)	2008	30	19	21	25	40

Table 2. Most important reasons for quitting selling sweet products totally, quitting to sell some sweet products and starting to sell healthy products (%) among schools that participated both years (n=319).

Reason Change	*Pupils' health*	*FNBE and KTL recommendation*	*Municipality's or teachers' decision*	*Media or public discussion*	*Parents' wishes*	*Other reason*
Quitting to sell sweet products totally (n=50)	40	38	30	2	6	12
Quitting to sell some sweet products (n=61)	44	28	26	9	8	8
Starting to sell healthy products (n=43)	56	30	19	5	2	14

Note: Schools were asked to name two reasons.

Table 3. Percentages of schools selling sweet products (any), candies, soft drinks, other sweet products or healthy products in the schools that participated both years (n=319) according to number of pupils in the school in 2007 and 2008.

	Sweet products (any)		*Candies*		*Soft drinks*		*Other sweet products*		*Healthy products*	
Number of pupils	*2007*	*2008*	*2007*	*2008*	*2007*	*2008*	*2007*	*2008*	*2007*	*2008*
<100	14	7	14	10	9	21	9	7	5	3
100-299	52	47	38	27	30	25	22	27	33	41
300-499	68	60	35	28	44	33	33	27	61	71
500+	63	60	39	33	37	26	43	47	69	74
All schools	56	50	35	27	35	28	29	29	47	54
p-values	<0.001	<0.001	0.158	0.164	0.006	0.416	0.004	0.001	<0.001	<0.001

Note: Chi-square test was used.

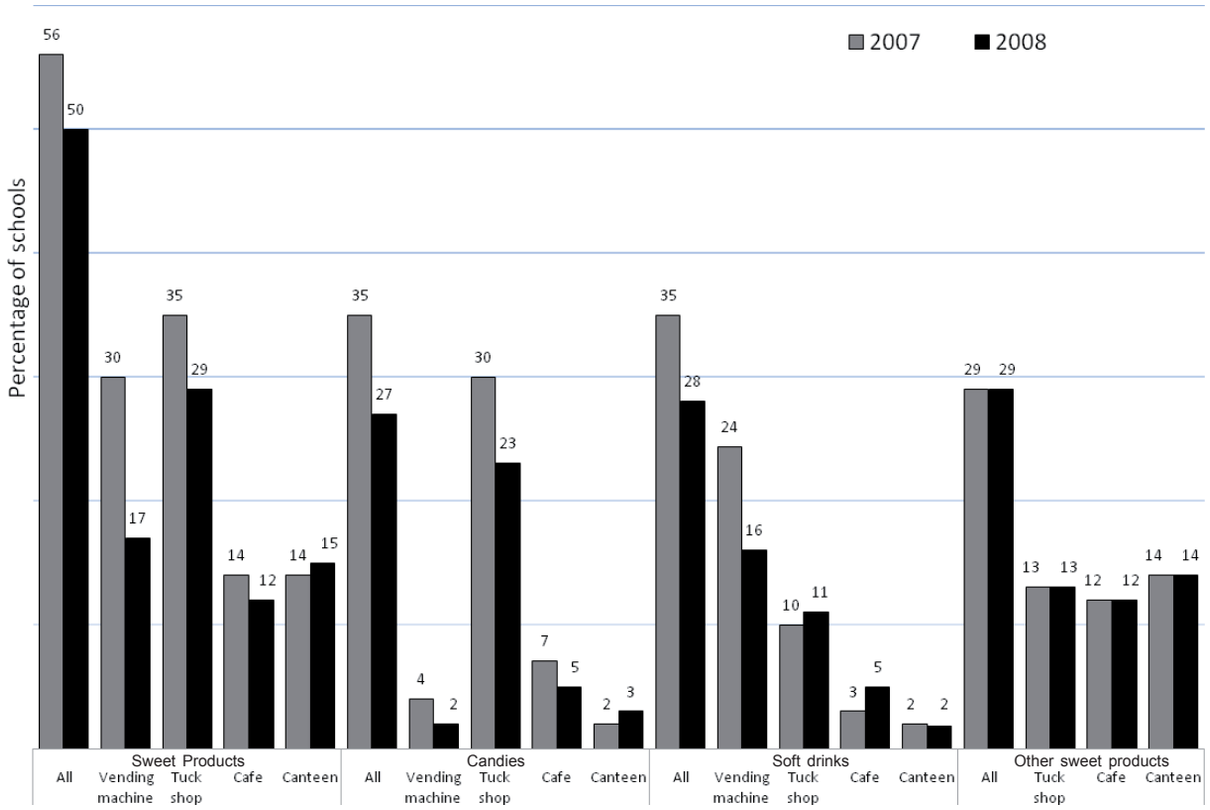

Figure 2. *Percentage of schools selling sweet products (any of candies, soft drinks and other sweet products) via vending machines, tuck shops, cafés or canteens in 2007 and 2008 among the schools that participated in both years (n=319)*

Discussion

Selling sweet products in Finnish upper level comprehensive schools had decreased during the follow-up time. The national recommendation and pupils' health were the main reasons stated for why schools had quit selling sweet products.

The response rate of the study was reasonable, as half of the upper level of comprehensive schools in Finland responded. It was easy for school personnel to answer online, which may have increased the response rate. Both years the geographical distribution of the responding schools was similar to the geographical distribution of all the schools in Finland. The distribution according to number of pupils in the school varied between 2007 and 2008. However, the main results were similar to those of the schools that responded both years. The study population can be considered representative enough for the results to be generalised to the Finnish upper level comprehensive schools.

Little information is available about the effectiveness of different programs on schools sweet products selling (Hawkes, 2010). Previous studies have been part of larger multi-modal programs, for example, the program in the United States, the School Food Trust program in the United Kingdom and the Dentists against sweets and soft drinks in Sweden (Hawkes, 2010; Matthew *et al*., 2008; School Food Trust, 2007; SDA, 2008). Our research was a single-component intervention that included only a recommendation to schools not to sell sweet products. To our knowledge, there is no research, on what kind of intervention is most effective in prevention of sweet selling in schools. For smoking prevention in schools, however, multi-modal programs have proved to be more effective than single-component interventions, but the evidence has been limited (Thomas and Perera, 2006).

Even though selling sweet products in schools had decreased, almost half of the upper comprehensive schools in Finland continue to sell them. National recommendations are effective, but alone are not enough for schools to become healthy environments (WHO, 1986). In the UK, the government ended up resorting to legislation to decrease sales of sweets, because they wanted to ensure that schools would conform to the recommendation (School Food Trust, 2007). In the public discussion in Finland this solution has also been proposed. However, many first want to see the impact of the national recommendation. Schools reported that if they do not sell sweet products in school, pupils will visit a nearby shop and buy even larger bags of candy and larger bottles of soft drinks. Thus, besides removing vending machines from schools we should make pupils and their parents appreciate the extent of the problem. That is why information and local community actions are needed (WHO, 1986). Even legislation does not always work: according to our results, there are still trademarks on school's vending machines, even though they are forbidden in Finland, and were specifically mentioned in the national recommendation.

The Swedish program mobilized the gamut of health promotion, including informing, lobbying politicians, co-operating both within the health care system and throughout the society, networking and using media publicity, which might explain their excellent results. Providing factual information on children's and adolescents' consumption of sweet products published in the media were seen as important for galvanizing people to action (SDA, 2008).

It is important to evaluate properly the process and effects of any intervention. In the open-ended questions, schools reported being pleased that their activity and development were monitored, and they could not just disregard the recommendation. It is also important to publish the results of evaluations not only in scientific publications but also in national media for the whole population. Pupils and their parents may then begin to wonder why their school still sells sweet products and may increase pressure to change. All these actions make such programs multi-modal and can lead to better and more sustainable results (Thomas and Perera, 2006).

In open-ended questions, schools often passed the responsibility for adolescents' excessive consumption of sweet products to the parents. However, the role of excessive sugar intake as a common risk factor for many diseases should be taken as an opportunity to approach the problem by cooperation not only within the health care system, but with policymakers, schools, pupils and parents (Sheiham and Watt, 2000; WHO, 1986). Finnish schools' parents' and pupils' associations and management boards are appropriate institutions for this kind of local activity (EC, 2009). At the same time, cooperation requires a leader; this role fits local oral health care professionals: dentists, dental hygienists and dental assistants, well. Changes need decision-makers, but change will not occur without unstinting work at the grass roots level (WHO, 1986).

Recommendation by high-level organizations is a useful way to promote health in school, but it must be announced widely in the media and evaluated properly. The results are better if the whole community is informed and motivated by facts about the current situation. Such a process can then also be followed more easily by legislative measures. Development of the sales of sweet products in Finnish upper comprehensive schools will be monitored in the future. Further research on the effectiveness of different means for promoting health in school is also needed.

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References

Commission of the European Communities (2007): *White paper on a Strategy for Europe on Nutrition, Overweight and Obesity related health issues.* Brussels. Publication no. SEC(2007) 706, SEC(2007) 707. http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/nutrition_wp_en.pdf

European Commission (2009*): Structures of education, vocational training and adult education systems in Europe. Finland 2009/2010.* Brussels. http://eacea.ec.europa.eu/education/eurydice/documents/eurybase/structures/041_fi_en.pdf

Finnish National Board of Education (2004): *National core curriculum for basic education.* Helsinki. http://www.oph.fi/english/publications/2009/national_core_curricula_for_basci_education

Finnish National Board of Education (2008): *School meals in Finland - Investment in learning.* Helsinki. http://www.oph.fi/instancedata/prime_product_julkaisu/oph/embeds/47657_school_meals_in_finland.pdf

Gabriel, C.G., Vasconcelos, F.de A., Andrade, D.F. and Schmitz B.de A. (2009). First law regulating school canteens in Brazil: evaluation after seven years of implementation. *Archivos Latinoamericanos de Nutrición* **59**, 128-138.

Harris, J.L., Pomeranz, J.L., Lobstein, T. and Brownell, K.D. (2009): A Crisis in the Marketplace: How Food Marketing Contributes to Childhood Obesity and What Can Be Done. *Annual Review of Public Health* **30**, 211–225.

Hawkes, C. (2008): Regulations, guidelines and voluntary initiatives on soft drink availability in schools around the world. An unpublished report prepared for the World Heart Federation, Geneva. http://www.dumpsoda.org/hawkeswhffinaldec2008.pdf

Hawkes, C. (2010): The Worldwide Battle Against Soft Drinks in Schools. *American Journal of Preventive Medicine* **38**, 457–461.

Matthews, A., Kaur, A. and Cowburn, G. (2008). School Food Trust. *Vending in English secondary schools. A national survey.* British Heart Foundation Health Promotion Research Group. http://www.schoolfoodtrust.org.uk/uploaddocs/library/documents/sft_vending_in_english2ndary_schools_oct08.pdfMinistry of Social Affairs and Health (2001): *Government Resolution on the Health 2015 public health programme.* Helsinki. Publication no. Brochures 2001:8eng http://www.terveys2015.fi/esite_eng.pdf

Petersen, P.E. (2009): Global policy for improvement of oral health in the 21st century – implications to oral health research of World Health Assembly 2007, World Health Organization. *Community Dentistry and Oral Epidemiology* **37**, 1–8.

School Food Trust (2007): *A guide to introducing the Government's new food-based standards for all school food other than lunches.* http://www.schoolfoodtrust.org.uk/uploaddocs/library/documents/sft_non-lunch_guidance.pdf

Sheiham, A. and Watt, R.G. (2000): The Common Risk Factor Approach: a rational basis for promoting oral health. *Community Dentistry and Oral Epidemiology* **28**, 399–406.

The Nordic Council of Ministers (2006): *Health, food and physical activity: Nordic Plan of Action on better life through diet and physical activity.* Copenhagen. Publication no. ANP 2006:745 http://www.slv.se/upload/dokument/rapporter/mat_naring/nordisk_%20handlingsplan_2006_matvanor_fysisk_aktivitet.pdf

The Swedish Dental Association (2008): Dentists against sweets and soft drinks. http://www.tandlakarforbundet.se/media/60892/kampanjen%20tandl%c3%a4kare%20mot%20godis%20och%20l%c3%a4sk%20-%20sammanfattning%20eng.pdf

Thomas, R.E. and Perera, R. (2006): School-based programmes for preventing smoking. Cochrane Database of Systematic Reviews, 2006;3

World Health Organization (1986): *The Ottawa charter for health promotion*. Ottawa. Publication no. WHO/HPR/HEP/95.1. http://www.who.int/hpr/nph/docs/ottawa_charter_hp.pdf

World Health Organization (1998): *WHO's Global School health Initiative.* Geneva. Publication no. WHO/HPR/HEP/98.4 http://www.who.int/school_youth_health/media/en/92.pdf

World Health Organization (2003a): *WHO Global Strategy on Diet, Physical Activity and Health.* Geneva. Publication no. WHO/NMH/EXR.02.2 Rev.1. http://whqlibdoc.who.int/hq/2003/who_nmh_exr.02.2_rev.1.pdf

World Health Organization (2003b): *WHO Information series on school health. Oral Health Promotion: An Essential Element of a Health-Promoting School.* Geneva. Publication no. WHO/NMH/NPH/ORH/School/03.3 http://www.who.int/oral_health/media/en/orh_school_doc11.pdf

World Health Organization (2008): *WHO global strategy on diet, physical activity and health: a framework to monitor and evaluate implementation.* Geneva. http://www.who.int/dietphysicalactivity/m&e-eng-09.pdf