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Jaakko Anttila

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‘Why treat people and send them back to the conditions that made them sick?’

– Sir Michael Marmot

To Anne and my wonderful boys

ABSTRACT

Jaakko Anttila

Impacts of a National Recommendation on the Sale of Sweet Products in Finnish Schools – School-Level Factors and Oral Health Inequalities

University of Turku, Faculty of Medicine, Department of Community Dentistry
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The objective was to find out 1) if the national recommendation has had any effect on schools' oral health-promoting actions, 2a) whether the school-level intermediary determinants were associated with the school-level socioeconomic position (SEP) and 2b) whether the effects of the national recommendation on schools' intermediary determinants differed according to the school-level SEP.

The study is based on two datasets independently collected from Finnish upper-level comprehensive schools (N=970): the oral health-promoting actions (OHPA) data were collected through an online survey arranged in 2007 (n=480), 2008 (n=508), 2009 (n=593) and 2010 (n=478) and the oral health behaviour data via the national School Health Promotion Study. The combined, longitudinal dataset (n=360) used in this study was formed based on these two datasets. Aim 1 was investigated based on the schools that responded to the OHPA survey in 2007-2009 (n=258) and both in 2007 and in 2010 (n=237). The baseline and longitudinal combined data were used to examine aims 2a and 2b, respectively.

The national recommendation has influenced schools' oral health-promoting actions: schools have decreased their sweet snack and soft drink selling to pupils. In addition, there seem to be associations between school-level intermediary determinants and the school-level SEP. The impact of the national recommendation on the sale of sweet products in schools was similar across all school-level SEP groups.

Overall, the national recommendation was an effective tool to decrease sweet selling in Finnish schools without increasing inequalities in sweet selling. To eradicate the sale of sweet products altogether from Finnish schools, stricter actions such as legislation prohibiting the sale of unhealthy products in schools may be needed.

Keywords: Adolescents, Sweets, Carbonated Beverages, Oral Health Promotion, Inequalities, National Recommendation, Schools, Socioeconomic Factors

TIIVISTELMÄ

Jaakko Anttila

Kansallisen suosituksen vaikutukset koulujen makeanmyyntiin – koulutason tekijät ja suun terveyserot

Turun yliopisto, Lääketieteellinen tiedekunta, Sosiaalihammaslääketieteen oppiaine
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Väitöstutkimuksessa selvitettiin, 1) vaikuttiko kansallinen suositus koulujen suun terveyttä edistäviin toimiin, 2a) ovatko koulutason välilliset tekijät yhteydessä koulujen sosioekonomiseen asemaan ja 2b) vaihtelivatko kansallisen suosituksen vaikutukset välillisiin tekijöihin koulujen sosioekonomisen aseman mukaan.

Tutkimuksen tietoaineisto koostui kahdesta kaikilta suomalaisilta yläkouluilta (N=970) erikseen kerätystä aineistosta: suun terveyden edistämiseen liittyviä toimia koskeva aineisto kerättiin vuosina 2007 (n=480), 2008 (n=508), 2009 (n=593) ja 2010 (n=478) kouluille järjestetyn kyselyn avulla, kun taas suun terveyteen liittyviä tapoja koskeva aineisto koostettiin Kouluterveyskyselyyn vastanneilta oppilailta. Näistä aineistoista muodostettiin yhdistetty aineisto (n=360). Ensimmäistä tutkimuskysymystä selvitettiin suun terveyden edistämiseen liittyviä toimia koskevan, vuosina 2007–2009 (n=258) sekä vuosina 2007 ja 2010 (n=237) kerätyn pitkittäisaineiston perusteella. Toisen tutkimuskysymyksen (2a) selvittämisessä käytettiin yhdistettyä aineistoa tutkimuksen lähtötilanteessa, ja kolmatta tutkimuskysymystä (2b) selvitettiin pitkittäisen yhdistetyn aineiston perusteella.

Kansallisella suosituksella oli vaikutusta koulujen suun terveyttä edistäviin toimiin: koulut vähensivät makeisten ja virvoitusjuomien myyntiä. Lisäksi havaittiin, että koulutason välilliset tekijät ovat yhteydessä koulujen sosioekonomiseen asemaan. Kansallinen suositus myös vaikutti koulujen makeanmyyntiin yhtä paljon kaikissa koulujen sosioekonomisissa ryhmissä.

Kansallinen suositus osoittautui tehokkaaksi työkaluksi suomalaisten yläkoulujen makeanmyynnin vähentämisen kannalta ilman, että makeanmyynnin sosioekonomiset erot olisivat lisääntyneet. Tiukempia toimia, kuten lainsäädäntöä, voidaan tarvita, jos koulujen makeanmyynti halutaan kokonaan lopettaa.

Avainsanat: kansallinen suositus, koulut, makeiset, nuoret, sosioekonominen asema, suun terveys, terveyden edistäminen, terveyserot, virvoitusjuomat

TABLE OF CONTENTS

ABBREVIATIONS

BMI	Body mass index
CESCR	Committee on Economic, Social and Culture Rights
CRFA	Common risk factor approach
EFA	Explorative factor analysis
FDI	World Dental Federation
FNBE	Finnish National Board of Education (current Finnish National Agency for Education)
GLM	General linear model
ICOHIRP	International Centre for Oral Health Inequalities Research and Policy
LMM	Linear mixed modelling
SEP	Socioeconomic position
SHPS	School Health Promotion study
SSB	Sugar-sweetened beverage
SSSS	School Sweet Selling Survey
THL	National Institute for Health and Welfare
UN	United Nations
WHO	World Health Organization

LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following articles, which are referred to in the text by the Roman numerals I–IV

I Anttila J, Kankaanpää R, Tolvanen M, Saranpää S, Hiiri A and Lahti S. Do schools put children's oral health at risk owing to lack of a health-promoting policy? *Scand J Public Health* 2012; 40: 423-430.

II Anttila J, Rytkönen T, Kankaanpää R, Tolvanen M and Lahti S. Effect of national recommendation on sweet selling as an intervention for a healthier school environment. *Scand J Public Health* 2014; 43: 27-34.

III Anttila J, Tolvanen M, Kankaanpää R and Lahti S. Social gradient in intermediary determinants of oral health at school level in Finland. *Community Dent Health* 2018; 35: 75-80

IV Anttila J, Tolvanen M, Kankaanpää R and Lahti S. School-level changes in factors related to oral health inequalities after national recommendation on sweet selling. *Scand J Public Health* 2018; published online.
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1 INTRODUCTION

Over the last decades, clinical practice and dental services have been the main focus in efforts aimed to improve oral health. In industrialised countries, the mouth is the most expensive part of the body to treat (Sheiham *et al.* 2011). Finland has also spent a great deal of resources on treating dental caries, periodontal disease and other oral health-related problems. Still, the dramatic drop in dental caries and periodontal disease is mainly due to behavioural changes (e.g. those related to smoking or performing oral hygiene) and adding fluoride to products, whereas improved dental services only accounts for a small part of the reduction (Sheiham *et al.* 2011). In Finland, clinical procedures, such as professional fluoridation, fissure sealants and giving chair-side instructions for better self-care, have been used as preventative strategies against the most common oral diseases. Unfortunately, these measures are costly and tend to increase oral health inequalities (Watt *et al.* 2015b).

At the same time, Western countries are suffering from the major overweight and obesity epidemic, affecting both adults and children alike. Eating energy-dense carbohydrates causes not only weight gain but also oral diseases. Something needs to be done to reduce the burden of oral diseases and to stop the growing overweight and obesity problem. There is a social gradient both in obesity and in oral health, meaning that one group of people suffers from problems related to them more than other groups. Health inequalities are unjust and avoidable when people are made vulnerable by underlying social, political and economic structures (Sheiham *et al.* 2011). Reducing inequalities in general and oral health has been identified as an ethical imperative by the World Health Organization's (WHO) Commission on Social Determinants of Health, but so far little has been achieved in terms of reducing disparities in oral health (Lee & Divaris 2014).

Upstream actions (e.g. legislation, fiscal actions and macro-level policies) at population level are needed to resolve the obesity issue and to cut down oral diseases. Schools, workplaces and hospitals are important places to implement upstream measures that could reduce inequalities (Watt & Sheiham 2012). Schools have indeed been a popular setting for general and oral health promotion, and a lot of research and implementation have been targeted at schools. The school system in Finland has elements that could narrow the gaps in social and health inequalities: Finnish schools are publicly funded, education is compulsory for 6- to 17-year-olds, and schools offer a healthy hot meal during the school day free of charge. Pupils are obligated to attend school every single working day. Therefore, the school environment should not have any elements that could compromise pupils' health.

2 REVIEW OF LITERATURE

2.1 General and oral health promotion

2.1.1 Defining general and oral health

Already more than 70 years ago, WHO gave the following definition for 'health' in its Constitution: 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.' (World Health Organization 1946) This definition does not take into account the environment and circumstances people are living in. In recent years, there has been criticism that the old definition contributes to medicalisation if the ideal is to achieve a state of complete physical well-being (Huber *et al.* 2011, Jadad & O'Grady 2008). Huber *et al.* (2011) urge that in addition to the physical element, mental and social factors should be emphasised more in the reformulation of the definition for health. Shilton *et al.* (2011) have formulated a good alternative for a new definition of health: 'Health is created when individuals, families, and communities are afforded the income, education, and power to control their lives; and their needs and rights are supported by systems, environments, and policies that are enabling and conducive to better health.'

Although there is no universal consensus on how to define 'oral health', many researchers and national dental associations have developed their own definitions for oral health (Glick *et al.* 2016). Some definitions make references to the functionality of the teeth and to the social aspect of oral health, while others also emphasise the absence of disease (Glick *et al.* 2016, World Health Organization 2012, Yewe-Dyer 1993). In 2016, the FDI World Dental Federation introduced the following definition for oral health: 'Oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex.' (Glick *et al.* 2016) This definition emphasises that oral health is more than merely an absence of oral disease. Along with this new definition, FDI also presented a comprehensive framework for the oral health definition (Glick *et al.* 2016). It shifts the focus of dentistry from treating disease to providing care and support for oral health and emphasises that oral health does not occur in isolation but is related to overall health.

It is not irrelevant how general and oral health are defined because health is considered a basic human right by the United Nations (UN). As the UN body the

Committee on Economic, Social and Cultural Rights (CESCR) has stated in its General Comment No. 14, 'Health is a fundamental human right indispensable for the exercise of other human rights.' (CESCR 2000) The key message of human rights conventions is that the resources of the state or nation should be targeted to decrease inequalities and improve the status of those who are in the lowest position in society (Nykänen 2016).

In recent decades, our knowledge of the interaction between general and oral health has significantly increased. For example, it is now known that there is a link between periodontal disease and other health conditions, such as pregnancy, diabetes or cardiovascular diseases, and thus treatment of oral health problems may also have a beneficial impact on these general health conditions (Hummel & Phillips 2016). Even better results could be achieved by preventing oral diseases from developing in the first place. Many risk factors of oral diseases, such as smoking and dietary sugars, are also risk factors of several chronic diseases, such as diabetes and cardiovascular diseases (Sheiham & Watt 2000). There is such a strong link between general and oral health that it is hard to imagine good general health without good oral health, and vice versa.

2.1.2 Shortcomings of health promotion strategies

According to the Ottawa Charter for Health Promotion, 'Health promotion is the process of enabling people to increase control over, and to improve, their health.' (World Health Organization 1986) The main pillars of the Ottawa Charter are building healthy public policies, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services. These action areas have guided public health researchers, institutions and organisations, as well as entire nations to promote public health worldwide over the last three decades.

Even though all the action areas of the Ottawa Charter are well recognised, oral health promoters have mainly concentrated on the theme 'developing personal skills'. Developing personal skills to maintain good oral health is well-suited to the biomedical model of medicine adopted by oral health professionals in the past decades (Watt *et al.* 2015b). Most strategies to prevent oral diseases are directed towards changing behaviours (Moyses 2012). The approach to oral health promotion in the biomedical model is that preventive interventions focus very narrowly on diseases of an individual patient. In addition, the biomedical model often involves professional intervention, such as applying topical fluorides or fissure sealants, which is criticised for increasing medicalisation and being expensive (Watt *et al.* 2015b). On the other hand, fissure sealants and fluoride

varnishes have been demonstrated to decrease caries occurrence among more deprived populations (Chestnutt *et al.* 2017). The problem is that it is very difficult to identify individuals at a high risk of developing dental caries (Hausen 1997).

The aim of targeting high-risk individuals could be due to the emphasis on individualism in the modern society. The prevailing political and economic climate in the Western world can broadly be referred to as neoliberalism. Neoliberalism highlights individual and market responsibility with minimal government involvement (Ayo 2012). In terms of health, neoliberalism emphasises individual responsibility for making healthy choices, and healthcare companies are more than happy to market them to people. Some individuals make healthy choices, for example, to improve their nutrition or increase their physical activity. Some have justified this individualistic approach by arguing that when individuals are informed of the importance of better self-care, for example, by dental health professionals, they are more motivated to change their behaviours (Watt 2005). Unfortunately, this kind of individual health education has been considered ineffective (Yevlahova & Satur 2009). Big multinational companies with their large marketing budgets act as commercial determinants, advertising their unhealthy products to citizens of the neoliberal Western countries, also targeting children and adolescents (Harris *et al.* 2009). It is generally considered in Western countries that health inequalities are a consequence of choice, while studies indicate that in reality health behaviours only account for a small part of oral health inequalities (Ayo 2012, Sabbah *et al.* 2009).

In Finland, oral health promotion has been separated from general health promotion efforts in the past decades. Oral health has been ignored in comprehensive health promotion policies and programmes, even though unfavourable health behaviours, such as poor diet, hygiene and smoking, are strongly linked to both the most common oral diseases (dental caries, periodontitis, oral cancer, etc.) and general health problems (Baelum 2011). Oral health promotion has mainly been left in the hands of oral health professionals working in dental clinics. A lot of effort has been made to reduce dental caries levels, such as promoting tooth brushing twice a day and preventive clinical procedures (e.g. topical fluoridation of teeth and use of fissure sealants) and arranging information campaigns. Such measures have proved either ineffective or expensive and results achieved have not been long-lasting (Watt *et al.* 2015b). In addition, although a lot of effort has been put to decrease inequalities in oral health, inequalities still persist and have even increased in recent years (Lee and Divaris 2014, Watt *et al*. 2016).

2.1.3 Factors compromising general and oral health

Oral diseases can cause, for example, pain, discomfort and social problems, and 5 to 10% of public health expenditure relate to oral health (Petersen *et al.* 2005). According to Petersen *et al*. (2005), dental caries and periodontal diseases are considered the two most important global oral health burdens. Other oral diseases or conditions affecting people worldwide include oral mucosal lesions, oral cancer, and tooth loss (Hujoel 2009, Petersen *et al.* 2005). General and oral health involve several risk factors that could have negative effect on them, unhealthy diet and tobacco smoking being the two main risk factors (Petersen *et al.* 2005). Use of tobacco is the most important risk factor for oral cancer: nearly 1.3 billion adults smoke daily and 5.4 million people die annually of smoking-related diseases (Johnson *et al.* 2011). Smoking is also a major risk factor for periodontal disease, as well as for several general health conditions, such as stroke (Hujoel 2009). This should encourage health advocates to try even harder to eradicate smoking. An unhealthy diet, especially if it contains lots of sugars, contributes to dental caries, obesity, diabetes and cardiovascular diseases (Hujoel 2009). Oral hygiene procedures such as toothbrushing, flossing and the use of fluoride products help to reduce adverse effects of dietary carbohydrates (e.g. dental caries and periodontitis) but they cannot fully eradicate them.

In dental caries prevention, clinical procedures and information campaigns promoting better oral hygiene would not be needed if one single cause was successfully tackled, namely sugar (Sheiham & James 2015). Carbohydrates, most often sugars, eaten too frequently can cause oral diseases such as dental caries and periodontitis (Hujoel 2009). Sugar intake and the frequency of sugar consumption are linearly associated with dental caries (Bernabe *et al.* 2016). Besides oral diseases, consuming energy-dense carbohydrates such as soft drinks, sweets, chocolate, cakes, doughnuts, potato crisps or chips can lead to overweight and obesity (Mozaffarian 2017). Even one daily soft drink unit can increase weight gain and the risk of developing type II diabetes (Schulze *et al.* 2004). To reduce these adverse effects from sugar intake, WHO has issued a strong recommendation that the daily intake of free sugars should be reduced to less than 10% of the total energy intake (World Health Organization 2015). The costs of treatment of general health conditions are enormous. In 2005, the costs of treating obesity-related diseases such as type II diabetes mellitus and cardiovascular diseases in the United States totalled around USD 190 billion, which is up to 20% of the total annual healthcare expenditure in the US, while reports from other countries indicate that the indirect costs of obesity are equal to the direct obesity-related costs or may even exceed them (Lehnert *et al.* 2013).

2.2 Social gradient and oral health

2.2.1 Health inequalities and social determinants of health

Health inequalities are systematic differences in the health status of different population groups (World Health Organization 2017). These stepwise differences, for example, in health between groups from top to bottom of the socioeconomic spectrum are referred to by the concept of 'social gradient'. There are large inequalities in income, life expectancy and health within and across countries (Marmot 2005). The level of income, health and illness follows the social gradient: the higher the socioeconomic position (SEP) of an individual is, the better is their health (Marmot *et al.* 2008). Scandinavian countries have generally been considered more equal in terms of health and life expectancy than most other countries but, for example, in Finland in the 2010s, there are still inequalities in most dimensions of health and well-being that depend on the educational background (Talala *et al.* 2014). Absolute inequalities have decreased in other European countries except in Finland and Norway (Mackenbach *et al.* 2016).

Activities implemented to reduce inequalities can be broadly divided into the following three categories: (1) controlling major diseases that kill people, for example, via introduction of vaccinations and improvement of health systems (2) reducing poverty, for example, by offering more employment opportunities for deprived people, and (3) measures affecting social determinants of health, concentrating on the causes of the causes (Marmot 2005). Social determinants of health mean the circumstances in which people are born, grow up, live and work every day and cover factors that can affect people's physical and mental well-being, such as social gradient, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport (Wilkinson & Marmot 2003). In 2005, WHO established the Commission on Social Determinants of Health to review evidence, raise societal debate and recommend policies to reduce inequalities (Marmot 2005).

According to the Commission on Social Determinants of Health, social injustice is killing people on a grand scale (Marmot *et al.* 2008). Based on key findings, the Commission has recommended three principles of action to reduce health inequalities: (1) improve daily living conditions, with particular emphasis on early child development and the well-being of girls and women; (2) tackle the inequitable distribution of power, money and resources; and (3) measure and understand the problem and assess the impact of action (Marmot *et al.* 2008). Based on the work by the Commission on Social Determinants of Health, a conceptual framework was also developed (Solar & Irwin 2010). The WHO social

determinants framework combines both structural and intermediary determinants of health inequalities leading to good or poor health (Solar & Irwin 2010). Structural determinants include, for example, governance, macroeconomics and social/welfare policies, whereas intermediary determinants include elements such as material and social circumstances, behaviours and biological factors, psychosocial factors, and health services. Unequal distribution of intermediary determinants is associated with different amounts of exposure to health-compromising conditions generating health inequalities (Solar & Irwin 2010).

2.2.2 Social gradient in oral health and the framework for oral health inequalities

The mouth and oral health is intrinsically linked to the health of the rest of the body and to our surrounding environment. There is a social gradient in both general and oral health (Sabbah *et al.* 2007). Oral diseases have been, and still remain, a global problem, and disadvantaged people suffer more often from oral diseases compared to their well-off counterparts (Petersen & Kwan 2011, Schwendicke *et al.* 2015). Differences in oral health are not limited between the poorest and the richest but stepwise differences in oral health can be seen across the social spectrum, even in high-income countries (Moyses 2012, Sabbah *et al.* 2007). It has been discovered that there is a social gradient in several oral diseases and conditions, such as dental caries, oral cancer, periodontal disease, oral health-related quality of life, dental anxiety, tooth loss, and edentulousness (Bernabé *et al.* 2017, Burt 2005, Johnson *et al.* 2011, Sabbah *et al.* 2007, Sanders *et al.* 2009).

Oral health-related behaviours, such as toothbrushing with fluoride toothpaste, smoking and sugar consumption, also contribute to oral health inequalities but they do not fully account for the differences in oral health status (Watt *et al.* 2016). Poor oral health can affect the quality of life and even threaten job security and economic productivity (Petersen & Kwan 2011). Addressing oral health inequalities can only succeed if the underlying causes of social inequalities are tackled (Watt *et al.* 2015a). General and oral health inequalities have several similarities, suggesting that the social determinants are mainly the same for both general and oral health (Sabbah *et al.* 2007).

As in the WHO framework for social determinants of health, the framework for oral health inequalities also has two levels that contribute to oral health inequalities: structural determinants and intermediary determinants (Figure 1). Structural determinants cause unequal distribution of intermediary determinants through SEP that generates oral health inequalities. Based on this framework, it is necessary to balance the unequal distribution of intermediary determinants through

policies aimed at structural determinants in order to reduce inequalities in oral health (Watt & Sheiham 2012).

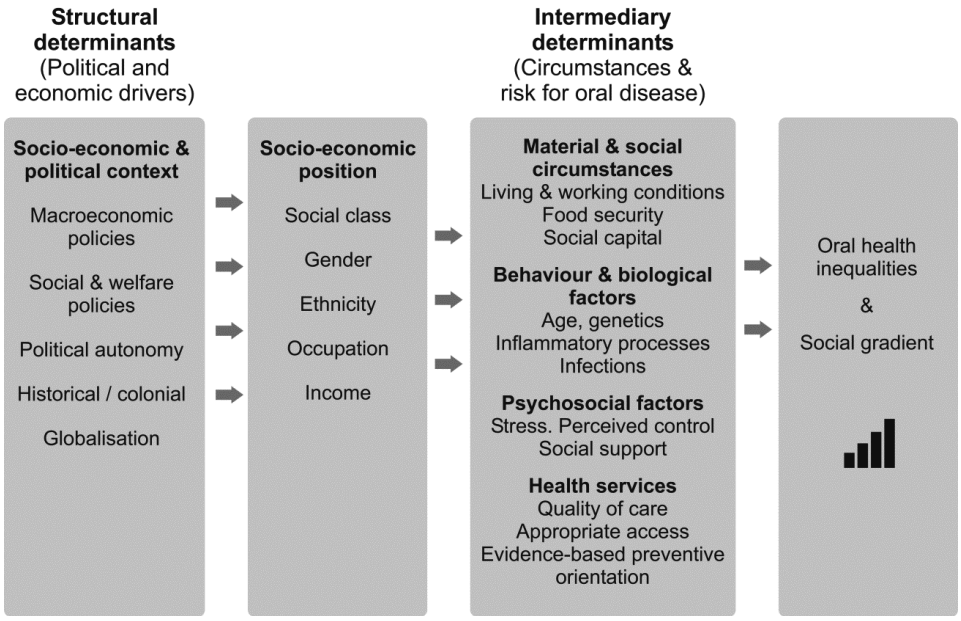

Figure 1. The framework for oral health inequalities, modified from (Watt & Sheiham 2012). Produced with the permission of the author.

In 2015, policy-makers and academics from 15 countries established a global network called the International Centre for Oral Health Inequalities Research & Policy (ICOHIRP) to reduce inequalities within and between countries. Following the launch conference, ICOHIRP published the London Charter on Oral Health Inequalities, which states that oral health inequalities are avoidable and that downstream individualistic interventions alone will not reduce oral health inequalities (Watt *et al.* 2016). Watt *et al.* (2016) called for a more fundamental upstream public health agenda and action at regional (e.g. creating healthy environments at a local level), national (e.g. regulating the sale of health compromising products and taxation thereof) and international (e.g. guidance by WHO on how to deal with, for example, sugar as a health compromising item) levels. Upstream actions are more distant factors from the perspective of the individual and aimed more often at the structures of society. Furthermore, oral health advocacy is another important element in lobbying local and national decision-makers to acknowledge the importance of oral diseases and their shared common risks with other diseases (Watt *et al.* 2016).

2.2.3 Strategies to improve general and oral health

Towards upstream actions

After the mid-1900s, some health policy researchers suggested that in order to decrease the rapid growth of health expenditure, social and environmental management should be used to improve the health of the population (McKinlay 1979). Around that time, the term 'upstream actions' was coined to describe actions that focus on the sources of illness in the social and physical environment. The term 'downstream actions' is used to refer to actions closer to individuals, such as people's behaviours or treatment provided by the healthcare system (Waitzkin 2016).

Downstream actions such as victim blaming, preventive care and lifestyle approaches covering measures such as fluoridation, the use of fissure sealants and chair-side prevention have not reduced oral health inequalities and may even increase them (Watt *et al.* 2015b, Watt 2007). Consequently, the social determinant framework instead encourages focusing on upstream factors, which are more underlying factors compared to downstream factors (Watt and Sheiham 2012). Instead of downstream actions, upstream actions such as legislative measures and healthy public policies are needed to achieve more sustainable changes in oral health, as well as to reduce oral health inequalities (Watt 2007). Upstream actions can address the causes behind oral health inequalities, i.e. the social determinants that affect general and oral health. Of our daily environments, schools are among the most important places to promote general and oral health (Watt & Sheiham 2012).

The common risk factor approach

Oral diseases share the same risk factors (stress, poor diet, smoking and alcohol consumption, etc.) as several illnesses of general health, such as cardiovascular diseases, diabetes, cancer, and respiratory diseases. The concept of the common risk factor approach (CRFA) is that many conditions could improve if those few common risk factors were controlled (Sheiham & Watt 2000). Instead of focusing on only one disease and its risk factors, the CRFA should be used for promoting both general and oral health to reduce the costs and to achieve a greater efficiency and effectiveness (Petersen & Kwan 2011, Sheiham & Watt 2000, Sheiham *et al.* 2011). This is very important since the costs of healthcare, including treating dental diseases, are constantly increasing and the money targeted to health promotion is limited (Fineberg 2013, Lehnert *et al.* 2013, Petersen *et al.* 2005). The CRFA also enable health professionals to avoid giving mixed messages to the public:

information disseminated in narrow disease-specific campaigns can be conflicting compared to other campaigns, which could confuse members of the public.

Although the CRFA has already been applied to integrate oral health promotion and general health promotion strategies, too often the target has still been on intermediary determinants instead of structural determinants (Watt & Sheiham 2012). It would be most effective to target the actions to early childhood, but also schools, workplaces and hospitals are key environments for health promotion and should be designed so that healthy choices are easy to make throughout people's lives (Watt & Sheiham 2012).

In medicine, the individualist approach is adopted too often. This means that rather than trying to find out real causes of the conditions at population level, practitioners are trying to identify a single factor behind the patient's illness (Rose 1985). In the prevention of diseases, there have been two main strategies: the high-risk strategy and the population strategy. In the high-risk strategy, individuals who already have a disease or a symptom of a disease are exposed to the intervention to promote healthier behaviours (Rose 1985). The high-risk strategy is also often adopted in oral health promotion: a patient who has cavities in the mouth is advised to brush their teeth more often. As previously mentioned, it is very hard to identify individuals at a high risk of developing dental caries (Hausen 1997). In the population strategy, the objective is to eliminate the underlying causes behind the disease and to make the entire population healthier (Rose 1985). To narrow the gaps in oral health and improve the health of the entire population, the population strategy should be used together with the CRFA and aimed to upstream actions (Watt & Sheiham 2012).

The effects of different health-promoting actions

Although numerous actions to improve general or oral health have been implemented throughout the world, too often only little attention has been paid to evaluating the effects of such measures on inequalities, or the effects have not been measured or reported at all (McGill *et al.* 2015, Moore *et al.* 2015). Mass-media campaigns and workplace smoking bans can be effective, but they tend to increase inequalities in health (Lorenc *et al.* 2013). In contrast, fiscal interventions, lowering price barriers and other upstream actions demonstrably reduce such inequalities (Lorenc *et al.* 2013). Obesity prevention programmes that have also worked in lower socioeconomic settings have included community-based strategies aimed at structural changes affecting the living environment, whereas interventions that have not been successful among lower SEP populations have targeted more individual-level behaviours (Beauchamp *et al.* 2014).

Interventions targeted at prices or everyday environments have proven the most effective. In addition, they have not increased health inequalities and in some cases have even decreased inequalities in health (McGill *et al.* 2015). In Brazil, children in lower SEP kindergartens with no policy on sugar consumption had a 4.8 times higher risk of dental caries (Rodrigues & Sheiham 2000). This encourages the use of upstream actions such as policies affecting everyday living environments, which could narrow inequalities in general and oral health. In order to tackle obesity in all socioeconomic groups and even to narrow the social gradient in obesity, whole-of-community interventions are recommended, meaning that the actions should be implemented in several environmental contexts (Boelsen-Robinson *et al.* 2015). If diet is one element of such a whole-of-community obesity intervention, it will likely also improve the oral health situation. A classic example of a successful whole-of-community intervention is the North Karelia Project, which significantly decreased cardiovascular mortality in Eastern Finland (Jousilahti *et al.* 2016).

2.3 Everyday environments to promote oral health

2.3.1 Childhood and adolescence everyday living environments

Early childhood environments are major predictors of cognitive and non-cognitive skills, and a child who falls behind may never catch up (Heckman 2006). Therefore, in early childhood, families are important targets for general and oral health promotion. When children grow up, the importance of parental involvement decreases, and adolescents are exposed to influences outside home. The peers and hobbies become more important and children start spending more time in schools, shopping centres and other gathering sites. Adolescence is a critical period in life and health behaviours adopted during that time can last throughout the rest of the lifetime (Viner *et al.* 2012). According to life-course epidemiology models, risks of oral disease can accumulate over the lifetime, meaning that health behaviours during adolescence do matter (Nicolau *et al.* 2007). For example, a study (Peres *et al.* 2016) carried out among Brazilian adolescents indicates that the higher the consumption of sugar consumption in adolescence, the higher the dental caries increment. According to a Norwegian cohort study, the consumption of soft drinks seems to increase and eating behaviours only rarely improve between the ages of 14 and 21 years (Lien *et al.* 2001). Consequently, childhood and adolescence are both important periods in life in terms of maintaining healthy behaviours and thus promoting healthy living environments is essential.

Adolescents' food choices do not merely depend on knowledge or behaviours learnt at home. Compared to children, adolescents are more independent in terms of making their own food choices, and the choices are not always good for their general or oral health (Story *et al.* 2002). Adolescents themselves have reported that easy access to unhealthy foods (both in schools and in environments where they spend their free time), peer influence and the price of unhealthy foods (unhealthy foods being most often the cheaper option) affected the most their food choices (Watts *et al.* 2015). During puberty and adolescence, brain development leads to new sets of behaviours and eventually to good or poor health over time (Viner *et al.* 2012). Improving adolescents' health requires improving their daily living environments. Safe and supportive schools are crucial in terms of helping adolescents to develop to their full potential and to reach the best possible health in adulthood (Viner *et al.* 2012).

2.3.2 Schools as avenues for oral health promotion

Schools are great places to promote oral health: at the global level, 80% of children attend primary school in an influential stage of their lives in terms of adopting sustainable oral health-promoting habits (World Health Organization 2003). According to WHO, 'Schools provide the most effective and efficient way to reach large portions of the population, including young people, school personnel, families and community members. Students can be reached at influential stages in their lives, during childhood and adolescence when lifelong nutritional patterns are formed.' (World Health Organization 1998) For example, drinking an adequate amount of safe drinking water enhances health and learning abilities, indicating that fresh drinking water should be available throughout the school day (World Health Organization 1998).

A health-promoting school environment helps pupils to make healthier choices and may even impact their lifelong attitudes and beliefs because this period is among the most influential in their lives (Kwan *et al.* 2005). In Finland, health and oral health promotion have been integrated to policy-making for decades (Melkas 2013). Schools have been an important venue for the implementation of those policies. In fact, health education is now compulsory for pupils (currently 1 one-hour lesson per week) in Finnish upper-level comprehensive schools (grades 7 to 9). (European Commission 2018) Health education books include one or two chapters about oral health, but it is not compulsory to teach oral health-related topics and thus about nine out of ten health education teachers teach oral health-related topics to their pupils (Kankaanpää 2014). Consequently, pupils are taught

a maximum of a couple of hours about oral health during their three years in upper comprehensive school.

Due to long school days, pupils spend a large part of their waking hours in school, which makes the school environment one of the most important places in their lives. In Finland, almost all comprehensive schools are public schools funded through taxation and education is provided free of charge at all levels (Finnish National Board of Education 2012). Every school day, schools must offer one warm meal free of charge to their pupils. This obligation is based on various acts (Finlex 1998a, Finlex 1998b, Finlex 2017). The school meal should also contain all the components of a well-balanced meal (Finnish National Board of Education 2008). In addition, the National Nutrition Council, Finnish National Agency for Education and the National Institute for Health and Welfare (THL) have jointly issued their comprehensive recommendations for school meals, (originally given in 2008 and updated in 2017; National Nutrition Council *et al.* 2017). The recommendations include information about the nutritional quality of school meals, including menus, as well as about specific foods and nutrients. The school meal is considered an important tool in the promotion of healthier food behaviours, and nutritious school meals have at least beneficial short-term impacts in terms of children's consumption of calories and key nutrients (Oostindjer *et al.* 2017).

One example of Finnish schools as an avenue for oral health-promotion is schools' tendency to encourage the use of Xylitol chewing gum. Xylitol chewing gum products are considered an anti-cariogenic agent (Maguire & Rugg-Gunn 2003). In Finland, the school-based xylitol programme has provided equally good results in caries prevention as the pit and fissure sealant programme (Alanen *et al.* 2000). Therefore, offering xylitol products or at least encouraging xylitol usage after school lunch could promote oral health among adolescents.

2.3.3 General and oral health-promoting interventions at school level

Schools are important venues for the promotion of dietary changes among adolescents (Prell *et al.* 2005). There are also studies that suggest the opposite, i.e. that the school food environment does not affect pupils' sweet consumption (Cvjetan *et al.* 2014, van der Horst *et al.* 2008). Nevertheless, most studies indicate that the school food environment really matters. According to a study carried out in the United States (Briefel *et al.* 2009), in schools that do not sell sweet products from stores or canteens, the total energy intake of pupils from sugar-sweetened beverages (SSB) is lower than in middle schools and high schools selling these products. Briefel *et al.* (2009) also state that pupils' energy intake was smaller if the school did not have a 'pouring rights' deal in place with a soft drink

manufacturer. Interventions implemented in schools have also proven to be effective in terms of affecting children's consumption of targeted nutrients, indicating that the school food environment does indeed have an effect on pupils' eating habits (Lytle *et al.* 1996). Furthermore, according to another study, competitive pricing increased the sale of low-fat snacks in US secondary schools (French *et al.* 2001). If pupils had access to unhealthy snacks, they chose more often the unhealthy option over fruits (Kubik *et al.* 2003). It has been noticed in the Netherlands that if an external operator was responsible for selling products from café, healthy products were sold less often (Mensink *et al.* 2012).

It has been suggested that selling sweet products in schools can be more harmful for children with a lower socioeconomic background: children from higher social groups use vending machines less often compared with children from other social groups (Maliderou *et al.* 2006). Pupils from a lower socioeconomic background also skip lunch more often (Park *et al.* 2010). Vending machines are considered particularly harmful for pupils' general and oral health, as products sold in vending machines are mostly soft drinks with lots of sugars and limited nutritional value. School vending machines have been shown to affect the total food consumption in younger grades but not among older pupils (Rovner *et al.* 2011). In a cohort study in Minnesota, the availability of soft drinks was associated with 9th grade students' total soft drink intake (Nanney *et al.* 2016). The study also showed that the availability of unhealthy snacks and drinks was associated with a small but significant (1%) increase in the student body mass index (BMI) percentile at school level.

Schools have also been a popular venue for reducing health inequalities. It has been reported that school-based interventions could worsen, improve or be neutral in terms of inequalities (Moore e*t al.* 2015). In a German randomised controlled trial concerning an intervention on weight status, lifestyle and blood pressure targeted at 6-year-olds revealed that eight years later, the BMI was lower in high SEP groups than in lower SEP groups (Plachta-Danielzik *et al.* 2011). Overall, this intervention increased inequalities in participants' weight status. In a Canadian study, school-day food choices of students with a higher socioeconomic background were better than those of students with a lower socioeconomic background (Ahmadi *et al.* 2015). Restricting access to unhealthy foods during school hours should therefore improve the nutrition of pupils from lower socioeconomic backgrounds, which could eventually also decrease the social gradient concerning unhealthy eating during school hours.

Eating school meals, especially if the nutritional value of the meal is good enough, is important for rapidly growing and developing adolescents. Pupils choose an unhealthy snack over lunch more often in schools that have a vending machine

selling soft drinks (Park *et al.* 2010). Pupils also eat the school meal less often if competitive foods are available (Templeton *et al.* 2005). The findings presented in this section indicate that pupils' consumption of unhealthy products is a complex subject and that the school food environment should be considered as a whole.

2.3.4 National recommendations, statewide mandates and other policies influencing the school food environment

According to the WHO Commission on Ending Childhood Obesity, policies to reduce obsogenic environments are needed, among other actions (Swinburn & Vandevijvere 2016). The school environment should be healthy: there should be no smoking or selling of sweet products, and the food offered should have good nutrition value. In addition, schools should also educate pupils on oral health and on the school health services available to them (World Health Organization 2003). Schools have been a very popular target for a number of interventions in the field of general and oral health promotion (Weichselbaum *et al.* 2011). Among other policies, the school policy is likely to have a great impact on the current and future well-being (Forrest & Riley 2004). According to the ICOHIRP conference themed 'Policy Solutions for Oral Health Inequalities', held in 2017, the school food policy is considered an important determinant for high sugar consumption (Rugg-Gunn 2017).

Policies have also been proposed to have favourable effects at international, national and local levels. Macro-level policies are regarded as structural determinants in the WHO social determinants framework that combines the structural and intermediary determinants of health inequalities leading to good or poor health (Solar & Irwin 2010). National recommendations, which can also be considered macro-level policies and structural determinants, are efforts targeted at, for example, institutions, schools or work places to promote healthy behaviours. National recommendations that focus on factors influencing population health can also be considered upstream factors, which are considered more effective in reducing the social gradient in health compared to downstream factors (Watt & Sheiham 2012). Schools' oral health-related actions, such as selling unhealthy products, can be considered an intermediary determinant that can be affected through structural determinants such as national recommendations (Figure 1).

Since schools are an important venue for promoting child and adolescent health, many countries and states have used national recommendations or comparable upstream actions to support pupils' healthy behaviours during the school day. In Norway, a national programme offering free fruits increased pupils' fruit consumption both during school hours and at home (Bere *et al.* 2010). Some school

policies have been effective in improving the food environment and dietary intake in schools (Jaime & Lock 2009). A statewide mandate obligating schools to implement local health-promoting policies improved schools' nutrition practices in the United States (Boles *et al.* 2011) In Minnesota, school policies promoting healthy eating were associated with improvements in the consumption of sugary drinks and fruits and vegetables (Nanney *et al.* 2014). Another study showed that a strict policy concerning the sale of competitive foods decreased pupils' BMI (Taber *et al.* 2012).

In Canada, a statewide recommendation was given on nutrition standards for foods and beverages offered in schools. As a result, the schools that implemented the recommendation reduced their sales of unhealthy products (Watts *et al.* 2014). School health policies should be broad enough to have real impact on several risk factors of different diseases with one policy (Kwan *et al.* 2005). Kwan *et al.* (2005) argue that the first step should be banning the sale of sweet products in schools. In France, a national recommendation succeeded in influencing the targeted nutrient intake in upper secondary schools (Bertin *et al.* 2012). According to reports, school guidelines on the food environment have also affected pupils' perception of their school-time consumption of beverages and, in some cases, even of the consumption of beverages outside the school hours (Vecchiarelli *et al.* 2006).

Not all interventions have succeeded in making the school environment healthier. For example, according to Kubik *et al.* (2010), policies restricting the sale of junk foods did decrease the sales in elementary and middle schools but not in high schools. In another case, although a statewide mandate did restrict the sale of sweet products in schools, at the same time it also decreases the provision of healthy products (Boles *et al.* 2011). There is a risk that if schools did not offer healthy products, pupils' would just venture outside the school area to buy their snacks, and most likely not the healthy ones, where possible. In open-campus-policy schools, students have been reported to eat more often in fast foods restaurants than in closed-campus-policy schools, whereas buying snacks has been shown to be related to the number of vending machines in schools (Neumark-Sztainer *et al.* 2005). A New Zealand study reported that a nutrition policy implemented at schools in deprived areas to ban soft drink consumption, launch a water-only policy and inform parents to supply their children with a healthy lunch decreased the caries levels in the participant schools compared with the control schools (Thornley *et al.* 2017). The most effective interventions take into account the school nutrition policy as a whole instead of only focusing on a single nutrient or site, as well as the circumstances outside school (Jaime & Lock 2009).

In the early 2000s, it was first noticed that some upper-level comprehensive schools in Finland had started to allow the sale of sweet products in schools. For

example, soft drinks and sweets were sold through tuck shops, cafés and vending machines. Since Finnish schools already provide a warm, free meal to their pupils, there is no need for any sweet products during school hours. In spring 2007, the National Board of Education (FNBE) and THL gave a national recommendation that schools should refrain from selling sweet products, that fresh drinking water should be available throughout the school day, and that any snacks sold or provided should be nutritionally appropriate (FNBE and THL 2007).

National recommendations have proven to be an effective tool to influence schools' food environment. However, there are no previous national or international studies on the long-term effects of national recommendations to schools' oral health-promoting actions. In addition, it is unclear if national recommendations concerning the school food environment have different effects on schools depending on the school's socioeconomic status.

3 AIMS OF THE STUDY

The general aim of this study is to determine any changes took place in the oral health-related environment of Finnish upper-level comprehensive schools following the national recommendation issued by the FNBE and THL. The specific aims are:

1. To find out if the national recommendation has had any effect on schools' oral health-promoting actions (Papers I and II).

2. To explore factors related to oral health inequalities at school level and

   (a) whether school-level intermediary determinants are associated with the school-level socioeconomic position (Paper III) and

   (b) whether the effects of the national recommendation on intermediary determinants differed according to the school-level socioeconomic position (Paper IV).

4 MATERIALS AND METHODS

This study was implemented at the Universities of Oulu and Turku in 2007-2018 in cooperation with the FNBE and THL. The study is based on two datasets independently collected from Finnish upper-level comprehensive schools (N=970), where pupils are between the ages of 13 and 16 years. Almost a total of 200,000 pupils attended the schools. The datasets are (1) the dataset of oral health-promoting actions and (2) the dataset of oral health behaviours, and they are discussed on more detail in sections 4.1 and 4.2, respectively. On the basis of these two datasets, a combined dataset was also formed. This is discussed in more detail in section 4.3. This thesis is a further study to the study of Kankaanpää (2014).

4.1 Dataset of oral health-promoting actions

The dataset of oral health-promoting actions was collected via the School Sweet Selling survey (SSSS) and included information about schools' oral health-related actions. The SSSS was conducted in cooperation by the FNBE and THL. The data were collected through questionnaires sent by email to every school in 2007 (N=985), 2008 (N=988), 2009 (N=970), and 2010 (N=970). The email included a web-link to the online questionnaire, produced using the Webropol program. In 2007, the survey was carried out at the same time when the FNBE and THL gave the national recommendation concerning the sale of sweet products. Consequently, the 2007 survey was used in this study as the baseline survey concerning the sale of sweet products in schools. The FNBE gave the email addresses of the schools to the research group in 2007. In most cases, the recipient was either the principal or a member of the school administrative staff. In the email sent to schools, it was requested that the questionnaire be answered by the person who knows the most about the sale of sweet products at the school in question. The list of addresses was updated for the following year's survey each year by asking the respondents to indicate their email address and based on information published on schools' web pages. Two (in 2007) or three (in 2008-2010) reminder emails were sent if the school had not answered the questionnaire. The writer of this thesis conducted the study in 2009 and 2010.

The SSSS questionnaire included a total of 34 questions. It was drawn up by modifying the questionnaire used in the longitudinal study 'Dentists against sweets and soft drinks in school' carried out by the Swedish Dental Association (Suslick 2009). The questionnaire was originally drawn up for the study of Kankaanpää (2014). Answering the survey took approximately fifteen minutes. The respondents were asked questions about the school practices related to the sale of

sweet products, providing healthy snacks, availability of fresh drinking water, and xylitol products, as well as about their policies regarding the consumption or sale of sweet products. All the questions used in the 2007 survey are listed in Appendix 1.

The following changes were made to the questionnaire after the 2007 survey: In 2008 and 2009, a new question was formulated regarding the topic of providing pupils with healthy snacks: 'Does your school provide a healthy snack during the school day?' In 2008, there were two alternative answers: 'Yes' and 'No'. In 2009, there were three alternative answers: 'Yes, and it is free', 'Yes, pupils pay for it' and 'No'. In 2007, the topic of providing healthy snacks was incorporated in the question covering the contents of the school guidelines. The changes were made because offering a healthy snack to pupils became more popular in schools after 2007. In 2008-2010, schools were also provided with a possibility to answer the questionnaire in Swedish, which is the second official language in Finland. In 2010, the response alternative concerning energy drinks was added to the questions covering the sale of soft drinks.

From the total of nine themes of the questionnaire, three variables were formed by weighting the response categories. The variables were: Exposure, Enabling and Policy (Table 1). The lower the score, the better the school's oral health-promoting actions. Replies to open-ended alternatives were checked individually and, where appropriate, added to the sum scores. Due to differences in the questionnaires for 2007, 2008, 2009 and 2010, the Enabling variable was calculated differently depending on the year (Table 1). In 2007, 0 points were given if the school had chosen the item 'School provides a healthy snack during the school day' in the question about the contents of the school guidelines. The variables Exposure, Enabling and Policy were used in the theoretical framework for oral health inequalities as intermediary determinants to describe the schools' oral health-related actions (Figure 2)

The number of schools that answered the questionnaire was 480 in 2007, 508 in 2008, 593 in 2009, and 478 in 2010, resulting in the response rates of 49%, 51%, 61%, and 49%, respectively. Of all schools, a total of 258 schools participated in the survey in 2007, 2008 and 2009 (response rate 27%, Paper I), and in total 237 schools participated in the survey both in 2007 and in 2010 (response rate 24%, Paper II). These two groups of schools were studied to find out if the national recommendation did have any impact on schools' oral health-promoting actions (Papers I and II).

Table 1. Calculation of the Exposure, Enabling and Policy variables. The lower the score, the better the oral health-promoting actions. Modified from Anttila *et al*. 2012.

Variable	Points awarded
Exposure (0-10 points)	
Selling soft drinks (maximum 4 points)	0: Soft drinks are not sold 2: Elsewhere but not through a vending machine 3: Through a vending machine without visible trademarks 4: Through a vending machine with visible trademarks
Selling sweets (maximum 4 points)	0: Sweets are not sold 2: Elsewhere but not through a vending machine 3: Through a vending machine without visible trademarks 4: Through a vending machine with visible trademarks
Selling sweet juices, cakes, doughnuts or biscuits (maximum 2 points)	0: Are not sold 2: Are sold
Enabling (0-10 points)	
Availability of drinking water during the school day (maximum 3 points)	0: In classrooms with mugs or from water taps in the hallway 1: In classrooms or at any time from the canteen 2: In bathrooms or during the lunchtime from the canteen 3: Through a vending machine
School's actions concerning xylitol products (maximum 3 points)	0: School offers free xylitol products 1: School sells xylitol products 2: Xylitol products are allowed 3: Xylitol products are forbidden
Selling and providing healthy snacks (maximum 4 points) 2007	0: School provides a healthy snack and sells healthy products 1: School provides a healthy snack 3: School does not provide a healthy snack but does sell healthy products 4: School does not provide a healthy snack or sell healthy products
2010	0: School provides a free healthy snack and sells healthy products 1: School provides a free healthy snack 2: School provides a healthy snack AND sells healthy products 3: School provides a healthy snack OR sells healthy products 4: School does not provide a healthy snack or sell healthy products
Policy (0-12 points)	
Leaving the schoolyard (maximum 3 points)	0: Banned and controlled 1: Banned but cannot be controlled 2: Only during breaks or lunchtime 3: At any time
Policy-makers (maximum 5 points)	0: At least five participants of the following: principal, teachers, pupils, parents, municipality, other 1: Four participants 2: Three participants 3: Two participants 4: One participant 5: No participants
Guideline contents (maximum 4 points)	0: No consumption of sweet products and the school provides a healthy snack 1: No sweet-product selling 2: Restriction or guidance on selling or consuming 3: No guideline

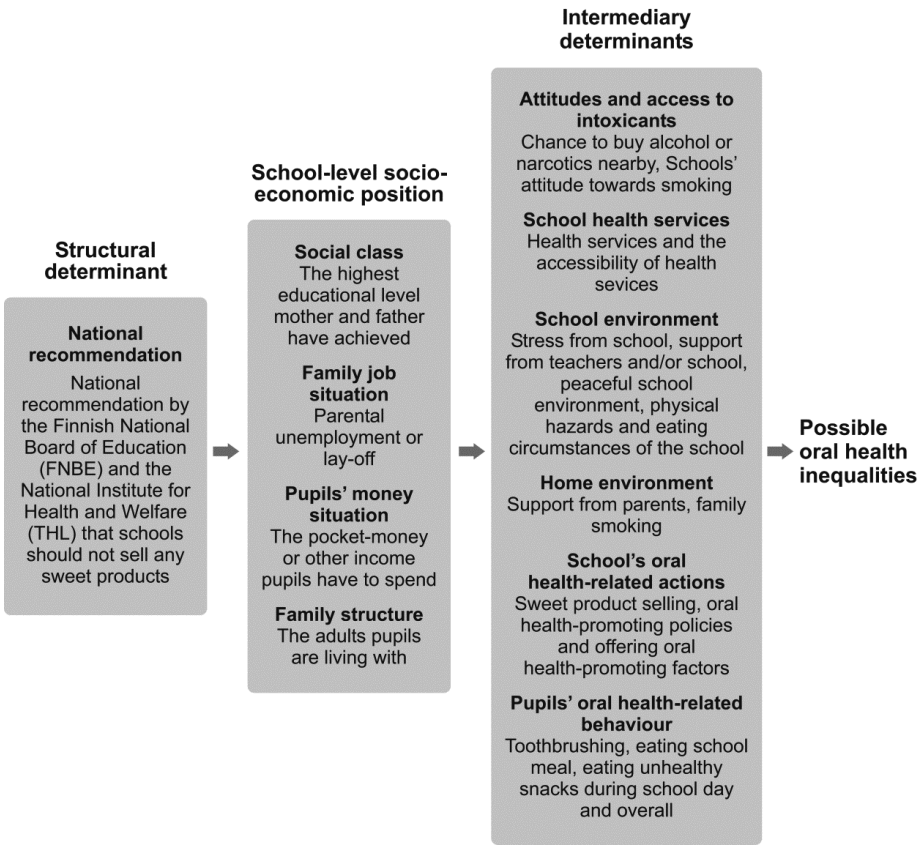

Figure 2. The variables used in the presented framework for oral health inequalities. Modified from Anttila *et al.* 2018.

School participation was voluntary, and the participants were informed of the study. Responding was considered a consent to participate. The Finnish Medical Research Act (Finlex 1999) and the ethical principles of the Finnish Advisory Board on Research Integrity (National Advisory Board on Research Ethics 2009) waive the need for obtaining approval for these types of studies.

4.2 Dataset of oral health behaviours

The data concerning pupils' perceived daily environment and oral health-related behaviours were collected in connection with the School Health Promotion study (SHPS), which has been conducted every two years (once a year for half of the schools) among all eighth and ninth grade pupils (i.e. children aged 14 to 15 and 15 to 16 years, respectively) in Finland since 1996. The study was carried out in Southern, Eastern and Northern Finland in spring 2006 and 2008 and in Western

and Central Finland in spring 2007 and 2009. The answers of the schools from 2006 and 2007 represent the pupils' oral health-related behaviours at the baseline, i.e. before the national recommendation was issued by the FNBE and THL. The questions concerning pupils' perceived daily environment and oral health-related behaviours were part of a more extensive questionnaire which included over a hundred questions on how the pupils feel about their living conditions, school conditions, health, health-related behaviour, and school health services. The questions used in the 2007 questionnaire are listed in Appendix 2. The same questions were also asked in the 2006, 2008 and 2009 surveys. School-level means were determined on the basis of the pupils' answers to the questions of the SHPS.

The participation in the SHPS was anonymous for pupils, and the participants were informed of the study. If there were fewer than 10 participants in a certain school or municipality, the results were not published at school- or municipality-level to safeguard the privacy of the respondents. The Ethics Committee of the National Institute for Health and Welfare gave its approval for the study.

Of the SHPS questions, we selected those that were applicable to the present theoretical framework for oral health inequalities (Figure 1), i.e. 29 questions in total (Appendix 3). If a question included multiple items (a, b, c,...k), the overall mean for the question was calculated from the item-wise means. Traditionally, there are no social class divisions in Finland (Karvonen *et al.* 2001). Therefore, five questions were chosen to describe the school-level SEP. The questions covered parental unemployment or lay-off (range 1-3), family structure (range 1-7), the highest education level the mother and the father have achieved (range 1-4), and the amount of spending money available to the pupil per week (range 1-6). The mean value was calculated to describe the school-level SEP; the lower the value, the better the school-level SEP. The schools were also classified into three equal-sized groups based on their school-level SEP, i.e. to low-, middle- and high-SEP schools.

Explorative factor analysis (EFA) with varimax rotation was used for the remaining 24 questions to form the intermediary determinants of oral health inequalities. The EFA revealed the following four factors: attitudes and access to intoxicants (F1), school health services (F2), school environment (F3), and home environment (F4) (Table 2, Figure 2). 'Attitudes and access to intoxicants' describes the attitudes towards intoxicant use and the availability of intoxicants. It covers questions such as whether smoking is allowed in school, how closely possible restrictions are monitored, and how easy it is to get alcohol or drugs in the pupil's area of residence. 'School health services' covers questions such as how easy it is to get help if needed from a school nurse, physician, social worker or psychologist and how easy it is to get an appointment. 'School environment'

describes how burdening the pupil feels going to school and whether the school environment is supportive and safe. It covers questions such as does the pupil feel stress from school work, does the pupil receive support and help from teachers, is the classroom discipline good, are there any factors that can disturb the school work (e.g. hurry, crowded teaching spaces, noise, inappropriate lighting, bad indoor air, temperature, dirt) and what is the mealtime environment like. 'Home environment' describes the level of support and the atmosphere at home. It covers questions such as if the pupil has difficulties at school, do they get help at home, does the family have family dinners, do the pupil's parents know personally most of their child's friends, do the parents know where the pupil spends their weekend nights and do the parents talk about things the pupil is concerned about. These factors explained 67.73% of the common variance. The factor scores were calculated as mean values of the items in each factor; the lower the mean, the better the pupil's perceived daily environment.

Table 2. Factor structure, percentage of common variance explained (%), loadings and mean values (SD) of pupils' perceived daily environment and school-level SEP. Modified from Anttila *et al.* 2018.

	Loadings	Mean	SD	Min	Max
F1: Attitudes and access to intoxicants (32.05%)		1.90	0.16	1.41	2.36
Chance to buy alcohol nearby	0.81	2.42	0.26	1.44	3.05
Chance to buy drugs nearby	0.77	1.51	0.16	1.14	2.00
School's attitude towards smoking	0.35	1.78	0.21	1.42	2.48
F2: School health services (18.40%)		2.32	0.19	1.95	3.55
Health services in the school	0.96	2.38	0.20	1.91	3.90
Access to school health services	0.79	2.25	0.21	1.70	3.20
F3: School environment (9.14%)		2.05	0.08	1.78	2.28
Physical hazards in the school	0.69	2.11	0.15	1.72	2.54
Peaceful school environment	0.68	2.31	0.13	1.76	2.92
Support from teachers and/or school	0.43	2.47	0.09	1.96	2.77
Stress from school	0.42	2.01	0.10	1.69	2.49
Eating circumstances in school	0.39	1.35	0.09	1.06	1.70
F4: Home environment (8.14%)		1.59	0.07	1.40	2.20
Parental support	0.81	1.78	0.08	1.36	2.35
Family smoking	0.45	1.40	0.07	1.19	1.97
School-level SEP	N/A	2.23	0.17	1.70	2.68

From the SHPS, four most relevant questions related to oral health were chosen as the intermediary determinants of oral health (Figure 2). The questions covered the following topics: tooth brushing frequency (how often the pupils brush their teeth), eating the school meal (which parts of the school meal do the pupils eat), eating

unhealthy items (such as sweets or SSBs) at school outside the school canteen (and apart from the school meal), and eating unhealthy items (such as sweets or SSBs) overall during the last seven days (Appendix 3). The sum variable 'eating habits at school' was calculated based on the variables 'eating the school meal' and 'eating unhealthy items at school'.

4.3 Combined dataset

To form a conceptual entity for the framework for oral health inequalities, the datasets of oral health-promoting actions and oral health behaviours were linked together to form a combined dataset (Figure 3). The linking was done manually by school name and location.

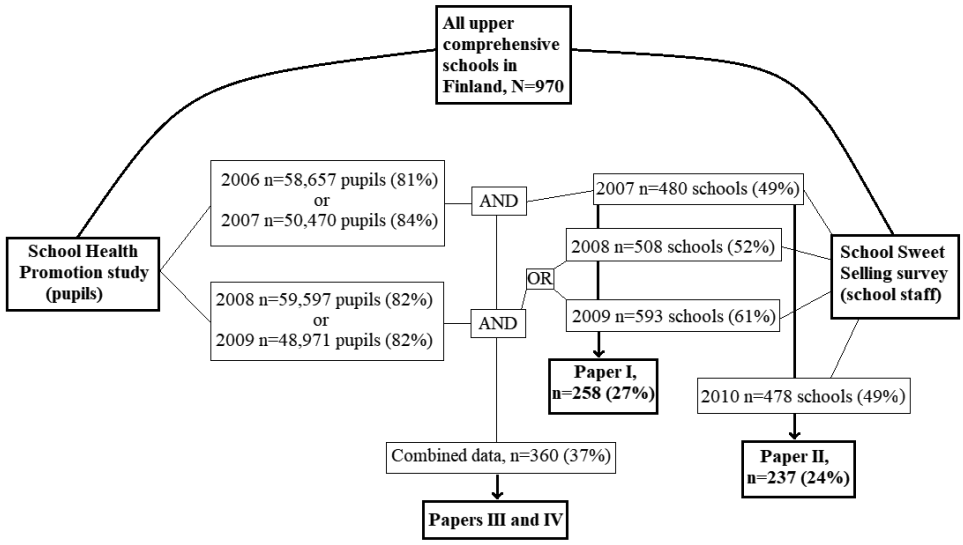

Figure 3. The datasets, numbers of respondents and response rates.

For this combined dataset, only the schools whose pupils had answered the oral health behaviour questionnaire both in 2006 or 2007 and in 2008 or 2009 and whose staff had completed the oral health practices questionnaire in 2007 and in 2008 or in 2009 were selected (n=360) (Figure 3). The baseline data from 2006 or 2007 were used to find out if the intermediary determinants were associated with the school-level SEP (Paper III). To examine whether the impact of the national recommendation on intermediary determinants differed based on the school-level SEP, the longitudinal data from 2006 or 2007 and 2008 or 2009 were used (Paper IV).

4.4 Analyses of the different datasets

To find out if the national recommendation has had an effect on schools' oral health-promoting actions, the data obtained through the SSSS was used (Papers I and II). Associations between the variables Exposure, Enabling and Policy were evaluated with Spearman correlation coefficients. The changes in Exposure, Enabling and Policy were evaluated using the Wilcoxon signed-ranks test. The changes in the sale of sweet and healthy products, the provision of xylitol products and fresh drinking water, allowing pupils to leave the schoolyard, school guidelines regarding the sale of sweet products, and in the number of guideline decision makers were analysed using McNemar's test. To explore status changes in the Exposure, Enabling and Policy variables, schools were divided into three groups. Schools were put in the Poor category if the Exposure score was 5 to 10 points, Enabling score 6 to 10 points and Policy score 8 to 12 points. Schools were in the Moderate category if the Exposure score was 2 to 4, Enabling score 4 to 5 and Policy score 6 to 7 points. Schools were placed in the Good category if the Exposure score was 0 to 1, Enabling score 0 to 3 and Policy score 0 to 5 points. The significances of the changes between the status of the Exposure, Enabling and Policy variables were analysed using McNemar-Bowker's test.

In Paper III, the baseline data of the combined dataset were used. The associations between the school-level SEP and intermediary determinants were evaluated using Pearson's or Spearman's correlation coefficients. In addition, correlations between different intermediary determinants were evaluated. Differences in the school-level SEP according to background variables (the school's geographical location, school size and teaching language of the school) were analysed using one-way ANOVA.

For the multivariable analysis, the General Linear Model (GLM) was used to determine the independent contribution of each intermediary determinant to the school-level SEP when controlling for background variables. The dependent variable was the school-level SEP and the independent variables were all the intermediary determinants of oral health, i.e. factors F1 to F4, the school's oral health-promoting actions (the Exposure, Enabling and Policy variables) and the pupils' oral health-related actions (tooth brushing, eating the school meal, eating unhealthy snacks at school and eating unhealthy snacks overall). The confounding factors were the school's geographical location (Southern Finland, Western Finland, the Oulu Region, Eastern Finland, and Lapland), school size (large: <500 pupils, medium-large: 300 to 499 pupils, medium-sized: 100 to 299 pupils, and small: <99 pupils) and teaching language (Finnish or Swedish). The model was conducted using manual backward elimination: all independent variables for which $p>0.05$ were excluded from the model to get a parsimonious and sufficiently

fitting model. For the final model, beta and Partial Eta Squared coefficients were reported. Since all the variables were coded in the same direction (the lower, the better), a positive beta coefficient indicates a positive association. Partial Eta Squared is a measure of effect size and describes the proportion of variance in the dependent variable explained by that independent variable.

To find out if the effect of the national recommendation on intermediary determinants differed based on the school-level SEP, the combined and longitudinal data were used (Paper IV). To evaluate the effects of the national recommendation and other changes in the intermediary determinants, the Wilcoxon signed-ranks test was used. Differences in the changes to the intermediary determinants between school SEP groups were analysed using the Kruskal-Wallis test. For the longitudinal multivariable analysis, Linear Mixed Modelling (LMM) was used to determine the independent contribution of each intermediary determinant to the changes in pupils' eating habits at school (a separate model for each SEP group). The dependent variable was pupils' eating habits at school at baseline and after the intervention, while the independent variables were all the intermediary determinants of oral health at baseline and after the intervention, i.e. factors F1 to F4 and the school's oral health-promoting actions (the Exposure, Enabling and Policy variables). For the model, beta and p-values were reported. Since all the variables were coded in the same direction (the lower, the better), a positive beta coefficient indicates a positive association.

The writer of this thesis conducted all the analyses, except for GLM and the LMM, which the writer carried out together with the supervisors.

5 RESULTS

5.1 Associations between oral health-related actions and reasons behind the changes in the sale of sweet products in schools by 2009 (Paper I)

Among the schools that responded to the survey every year between 2007 and 2009 (n=258), a positive correlation was found between the schools' oral health-promoting policies and oral health-enabling factors both in 2007 and in 2009. The schools that had allowed the sale of sweet products offered less oral health-enabling factors both in 2007 and in 2009 (Figure 4). The correlation between the Policy and Exposure variables in 2008 was weak but positive.

The main reason for the changes in the sale of sweet products differed among the schools that participated in the survey in all three years (i.e. in 2007, 2008 and 2009; n=258). Of the schools, the proportion of the schools that responded that their pupils' health was the main reason for the changes was 22.1%, 32.9% and 17.8% in 2007, 2008 and 2009, respectively. The decision of the municipality was given as the main reason by 7.0%, 17.4% and 11.6% of the schools. Of the schools, 0.8%, 17.1% and 8.1% stated that the recommendation of the FNBE and THL was the main reason for the changes.

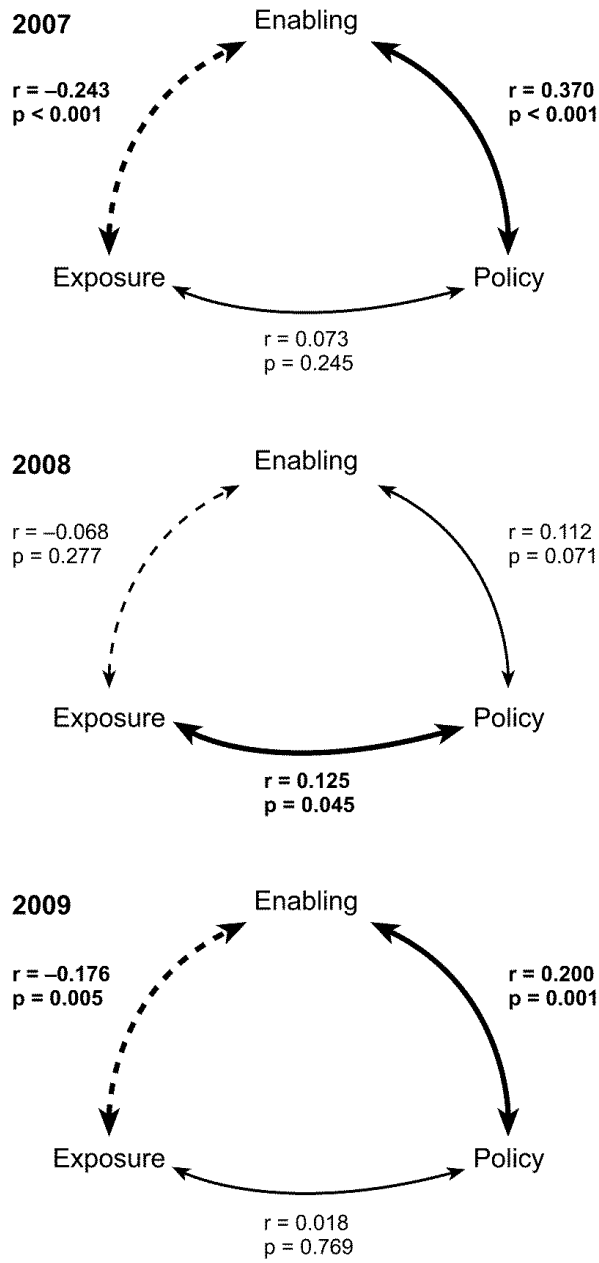

Figure 4. The associations between schools' oral health-promoting actions among the schools that responded every year between 2007 and 2009 (n=258). The correlations are statistically significant ($p<0.05$) if the line and the related text are bolded. A continuous arrow indicates a positive and a dotted arrow a negative correlation.

5.2 Effects of the national recommendation on schools' oral health-promoting actions (Paper II)

5.2.1 Changes in schools' oral health-related actions by 2010

Among the upper-level comprehensive schools that responded the survey both in 2007 and in 2010 (n=237), the schools had restricted the exposure of pupils to sweet products, increased their provision of oral health-enabling items to pupils and improved their oral health-promoting policy (Figure 5).

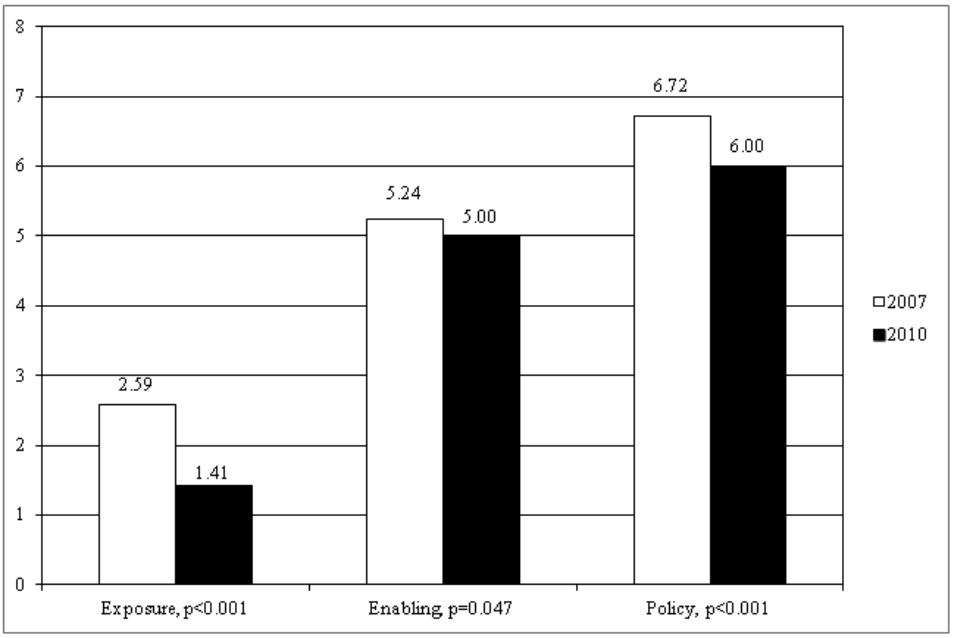

Figure 5. The mean changes in the Exposure (range 0-10), Enabling (range 0-10) and Policy (range 0-12) variables among the schools that responded the survey both in 2007 and in 2010 (n=237). The lower the score, the better the actions taken to ensure a healthier school environment. Modified from Anttila *et al.* 2014.

Furthermore, the upper-level comprehensive schools that responded both in 2007 and in 2010 (n=237) decreased their selling of sweets and soft drinks, but there were no changes in their selling of other sweet products during the follow-up (Figure 6). Selling soft drinks through vending machines had significantly decreased and selling sweets through vending machines had almost vanished.

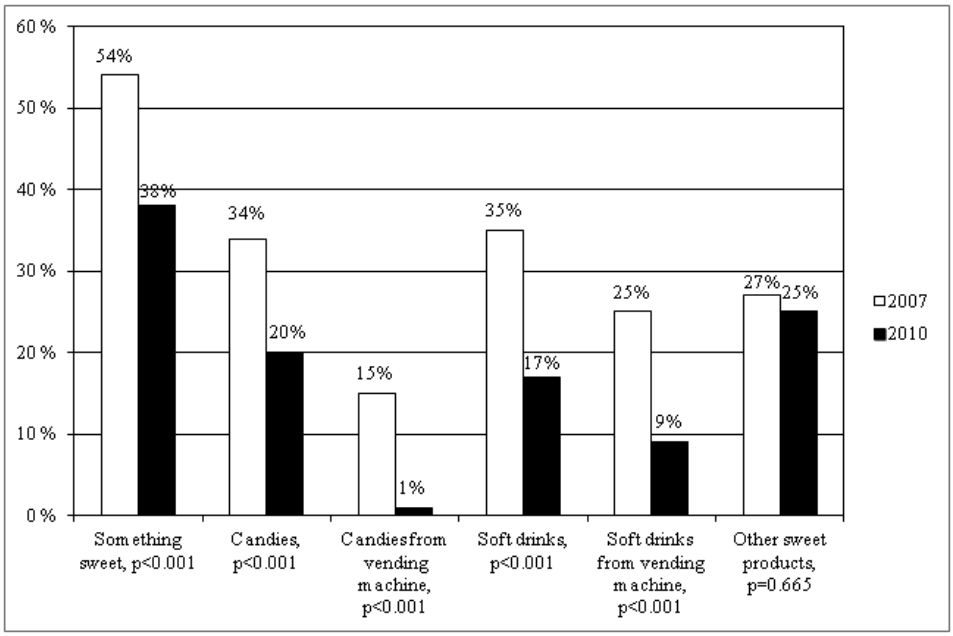

Figure 6. The percentage changes concerning the sale of sweet products in Finnish upper-level comprehensive schools between 2007 and 2010 among the schools that responded in the survey both in 2007 and in 2010 (n=237).

The schools provided a healthy snack and made fresh drinking water available slightly more often in 2010 than in 2007, but the changes were not statistically significant (Figure 7). School practices concerning xylitol products had not changed during the follow-up, however, the schools had improved all the three items comprising the Policy variable: they allowed their pupils to leave the school premises less often, their guidelines concerning the sale of sweet products were improved, and the number of people involved in making decisions about the sale of sweet products had increased (Figure 7).

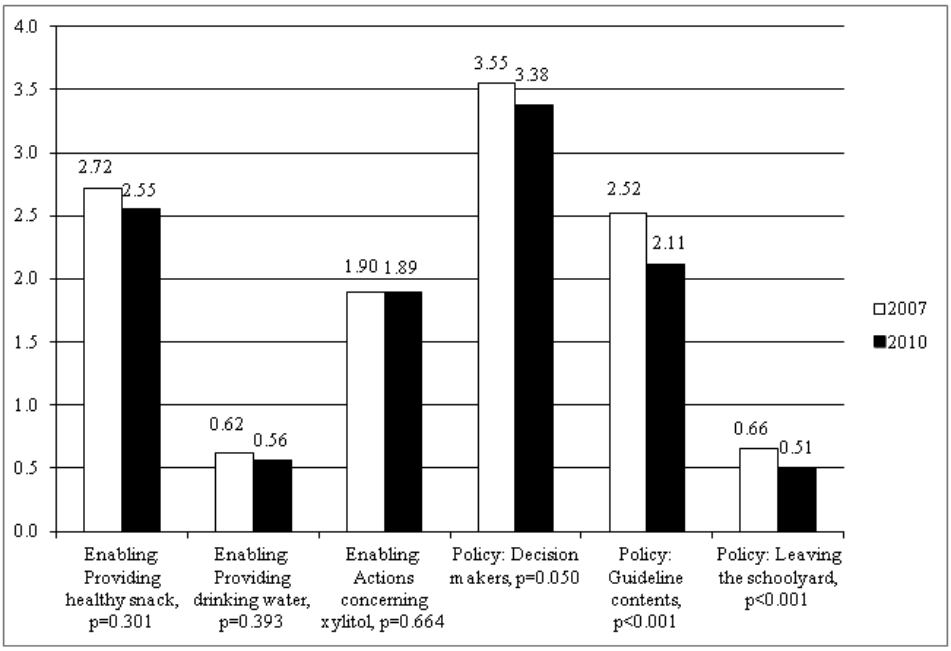

Figure 7. The mean changes in the Enabling and Policy variable items among the schools that responded in the survey both in 2007 and in 2010 (n=237). The lower the score, the better the actions taken to ensure a healthier school environment.

More schools improved than worsened their Exposure and Policy status ($p<0.001$), but schools in the good and poor Enabling category moved to the moderate Enabling category ($p=0.036$) between 2007 and 2010 among the schools that responded in both years (n=237) (Figure 8). Most of the schools kept their non-exposing status if they did not expose their pupils to sweet products at baseline.

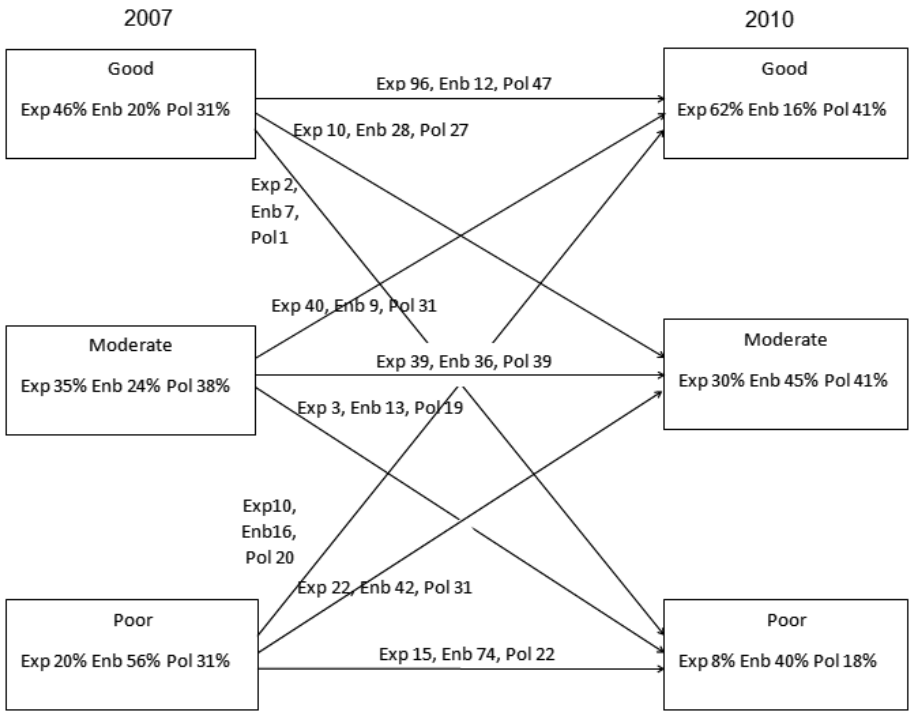

Figure 8. Exposure (Exp), Enabling (Enb) and Policy (Pol) variable distributions to good, moderate and poor categories and their stage transitions among the schools that responded both in 2007 and in 2010 (n=237). The distribution of variables to the categories is presented as percentages (%) in the boxes and the stage transitions are presented as numbers of schools above the arrows.

5.2.2 Other changes related to the sale of sweet products

There were changes in the main venue for the sale of sweet products, the party responsible for the sale of sweet products, and the party collecting the benefits from the sale of sweet products between 2007 and 2010 among the school that responded in both years (n=237). In 2007 (n=63), the main venue for the sale of other sweet products (sweetened juices and cakes, doughnuts or biscuits) were tuck shops (43%) and cafés (33%). In 2010 (n=59), the school canteen was the main venue for the of sale of sweetened juices (37%) and cakes, doughnuts and biscuits (44%). The party responsible for the sale of other sweet products was the student council in 76% and 54% of the schools and a party outside the school in 27% and 55% of the schools in 2007 and 2010, respectively. The party that collected the profits from the sale of other sweet products was the student council in 76% and 58% of the schools and a party outside the school in 27% and 53% of the schools

in 2007 and 2010, respectively. In the schools that sold sweets or soft drinks, there were no changes in terms of the party responsible for the sale of these products, but a party outside the school collected the profits more often in 2010.

5.3 Social gradient and intermediary determinants in schools (Paper III)

5.3.1 Associations between the school-level SEP and intermediary determinants

The school-level SEP correlated strongly and negatively with the attitudes and access to intoxicants (r=-0.60) in 2007 among the schools that were included in the combined data (n=360) (Figure 9). The school-level SEP correlated positively with the pupils' tooth brushing frequency (r=0.47) and negatively with the exposure to sweet products at school (r=-0.22), eating of the school meal (r=-0.31) and eating unhealthy snacks during the school day (r=-0.24).

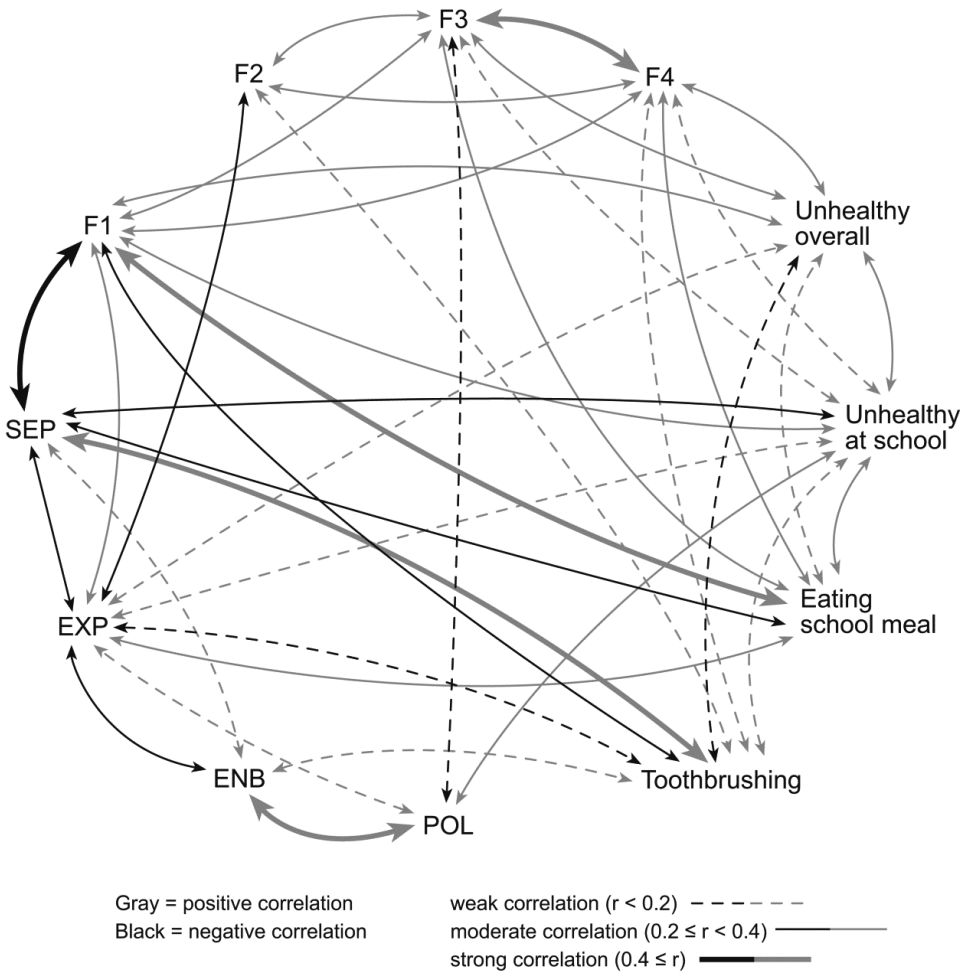

Figure 9. The intermediary determinants' associations with the school-level SEP and each other in 2007 among the schools that were included in the combined data (n=360). Abbreviations in used in the figure: School-level SEP (SEP), Attitudes and access to intoxicants (F1), School health services (F2), School environment (F3), Home environment (F4), Eating unhealthy snacks overall (Unhealthy overall), Eating unhealthy snacks at school (Unhealthy at school), Eating all elements of the school meal (Eating school meal), Pupils' tooth brushing (Toothbrushing), Schools' oral health-promoting policies (POL), Schools' oral health-enabling actions (ENB), and Schools' sweet product exposure (EXP). All the correlations were statistically significant ($p<0.05$).

5.3.2 Intermediary determinants' associations between each other

There were several correlations between the intermediary determinants in 2007 (n=360) (Figure 9). The schools' oral health-promoting actions correlated with the pupils' perception about the attitudes and access to intoxicants and the school health services, as well as with the pupils' oral health-related behaviour. Of the oral health-promoting actions, exposure to sweet products at school correlated most often with other intermediary determinants.

5.3.3 Social gradient in schools

A social gradient was also observed in all the background variables. The school-level SEP differed according to the school's geographical location (from the highest to the lowest): Southern Finland, Western Finland, the Oulu Region, Eastern Finland, and Lapland (2.16, 2.23, 2.32, 2.34, and 2.36, respectively). The school-level SEP also differed according to the school size (from the highest to the lowest): large (>500 pupils), medium-large (300 to 499 pupils), medium-sized (100 to 299 pupils), and small (<99 pupils) schools (2.16, 2.19, 2.29, and 2.37, respectively). On the basis of the teaching language, the school-level SEP was 2.24 and 2.05 when the language was Finnish and Swedish, respectively. All the differences were statistically significant ($p<0.001$).

The results of the multivariable GLM revealed that there was a social gradient in the pupils' perception about the attitudes and access to intoxicants, school health services and home environment and in the pupils' tooth brushing frequency, when adjusted for the school's geographical location, school size and teaching language of the school (Figure 10). The higher the school-level SEP, the worse the attitudes and access to intoxicants and the school health services and the better the home environment and the pupils' tooth brushing frequency. 'Attitudes and access to intoxicants' had the strongest and 'home environment' had the second strongest association with the school-level SEP, accounting for 24% and 10% of the variance in the school-level SEP, respectively. Overall, the model explained 55% of the variance in the school-level SEP.

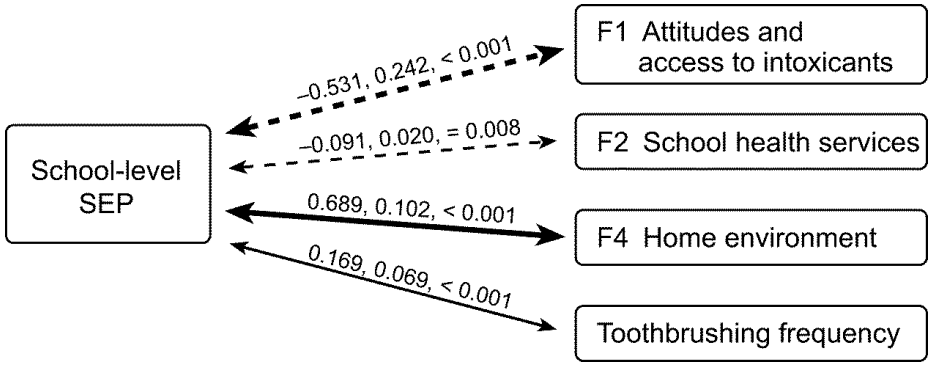

Figure 10. GLM of the school-level SEP contribution to the intermediary determinants in the Finnish upper-level comprehensive schools that were included in the combined data (n=360) in 2007, R^2=0.551. The numbers above the arrows are the Beta coefficient, the Partial Eta Squared and p-value, respectively. The continuous arrow indicates positive and dashed arrow negative correlation; the thicker arrow indicates a stronger correlation. The model is adjusted for the school's geographical location, school size and teaching language of the school.

5.4 Changes in intermediary determinants after the national recommendation and school-level SEP (Paper IV)

5.4.1 Changes in intermediary determinants

After the intervention, the schools that were included to the combined data (n=360) improved their oral health-promoting policies and decreased their sale of sweet products (Table 3). In addition, the school-level SEP and attitudes and access to intoxicants improved following the intervention.

Table 3. Mean values of the school-level SEP and the intermediary determinants before and after the intervention among the schools that were included in the combined data (n=360). Bolded values indicate that the change was statistically significant.

		2006-07	2008-09
	SEP	**2.23**	**2.19*** **
Factors F1-F4	F1: Attitudes and access to intoxicants	**1.90**	**1.87*** **
	Chance to buy alcohol nearby	**2.42**	**2.36*** **
	Chance to buy drugs nearby	**1.51**	**1.49***
	School's attitude towards smoking	**1.78**	**1.75*** **
	F2: School health services	2.32	2.30
	Health services in the school	**2.38**	**2.35***
	Access to school health services	2.25	2.25
	F3: School environment	2.05	2.04
	Physical hazards in the school	2.11	2.09
	Peaceful school environment	2.31	2.30
	Support from teachers and/or school	**2.47**	**2.45***
	Stress from school	2.01	2.02
	Eating circumstances in school	1.35	1.35
	F4: Home environment	**1.59**	**1.58***
	Parental support	**1.78**	**1.77***
	Family smoking	1.40	1.39
School oral health-promoting actions	Policy	**6.66**	**6.26***
	Exposure	**2.69**	**1.69*** **
	Enabling	5.12	5.25
Pupils' oral health-related habits	Eating school meal	1.23	1.24
	Unhealthy eating outside school canteen	**0.72**	**0.74***
	Eating habits at school	**1.95**	**1.98****

*, $p<0.05$; **, $p<0.01$; ***, $p<0.001$

5.4.2 Changes in intermediary determinants in different school-level SEP groups

There was an inverse social gradient in exposing pupils to sweet products based on the school-level SEP groups: schools in the high-SEP group sold sweet products more often compared to schools in the middle- and low-SEP groups. The national recommendation did not increase inequalities concerning the sale of sweet products in schools among the schools that were included in the combined data (n=360) (Table 4). The decrease after the intervention in the Exposure was almost identical for every school-level SEP group: 38%, 35% and 39% in high-, middle- and low-SEP groups, respectively. Oral health-promoting policies did improve only in the low-SEP schools after the intervention.

There was an inverse social gradient in eating school meal and eating unhealthy snacks at school both at baseline and after the intervention: pupils ate all the different elements of their school meal more often in the low-SEP schools than in the middle- and high-SEP groups (Table 4). After the intervention, pupils ate unhealthy snacks slightly more often at school in all school-level SEP groups but the changes were not statistically significant. In high-SEP schools, pupils' eating habits deteriorated after the intervention.

Table 4. The changes in intermediary determinants between the baseline (2006–07) and after the intervention (2008–09) according to the school-level SEP among the schools that were included in the combined data (n=360).

		Highest SEP (N=120)	Middle SEP (N=120)	Lowest SEP (N=120)	p-value[1]
Exposure	Baseline	3.57	2.61	1.88	**<0.001**
	After intervention	2.22	1.70	1.15	**0.001**
	p-value[2]	**<0.001**	**<0.001**	**0.001**	
Enabling	Baseline	4.78	5.10	5.48	**0.03**
	After intervention	5.14	5.52	5.10	0.29
	p-value[2]	**0.045**	**0.038**	0.07	
Policy	Baseline	6.63	6.48	6.86	0.38
	After intervention	6.18	6.29	6.30	0.94
	p-value[2]	0.07	0.61	**0.02**	
Eating school meal	Baseline	1.27	1.23	1.20	**<0.001**
	After intervention	1.29	1.23	1.19	**<0.001**
	p-value[2]	**0.045**	0.50	0.73	
Unhealthy snacking at school	Baseline	0.77	0.72	0.68	**<0.001**
	After intervention	0.79	0.75	0.69	**<0.001**
	p-value[2]	0.14	0.07	0.27	
Eating habits in schools	Baseline	2.04	1.95	1.88	**<0.001**
	After intervention	2.07	1.98	1.89	**<0.001**
	p-value[2]	**0.017**	0.090	0.382	

p-value[1], the significance of the difference between the SEP groups (Kruskal-Wallis test); p-value[2], significance of the change (Wilcoxon Signed-Ranks test)

Among the schools that were included in the combined data (n=360), pupils ate more often all the elements of the school meal and less often unhealthy snacks at school in schools that did not expose their pupils to sweet products. The difference between exposing and non-exposing schools increased further after the intervention (Table 5).

Table 5. Mean values of pupils' eating behaviours according to the school's status of exposing their pupils to sweet products among the schools that were included in the combined data (n=360).

		Always bad (n=144)	Worsened (n=15)	Improved (n=67)	Always good (n=134)	p[1]
Eating school meal	At baseline	1.25	1.25	1.24	1.20	**<0.001**
	After intervention	1.27	1.32	1.22	1.20	**<0.001**
	p[2]	**0.01**	**0.003**	0.21	0.86	
Eating unhealthy snacks at school	At baseline	0.75	0.74	0.73	0.69	**0.011**
	After intervention	0.78	0.81	0.71	0.71	**<0.001**
	p[2]	**0.01**	0.17	0.27	0.11	
Eating habits at school	At baseline	2.00	1.99	1.97	1.89	**<0.001**
	After intervention	2.05	1.99	1.93	1.92	**<0.001**
	p[2]	**<0.001**	**0.017**	0.100	0.135	

p-value[1], the significance of the difference between the groups (Kruskal-Wallis test); p-value[2], significance of the change (Wilcoxon Signed-Ranks test)

5.4.3 Intermediary determinants' contribution to pupils' eating habits in different school-level SEP groups

The results of the longitudinal multivariable LMM revealed that the school-level intermediary determinants contributed differently to pupils' eating habits in schools in different SEP groups among the schools that were included in the combined data (n=360) (Figure 11). The intermediary determinants contributed more to the eating habits of the pupils in lower-SEP schools.

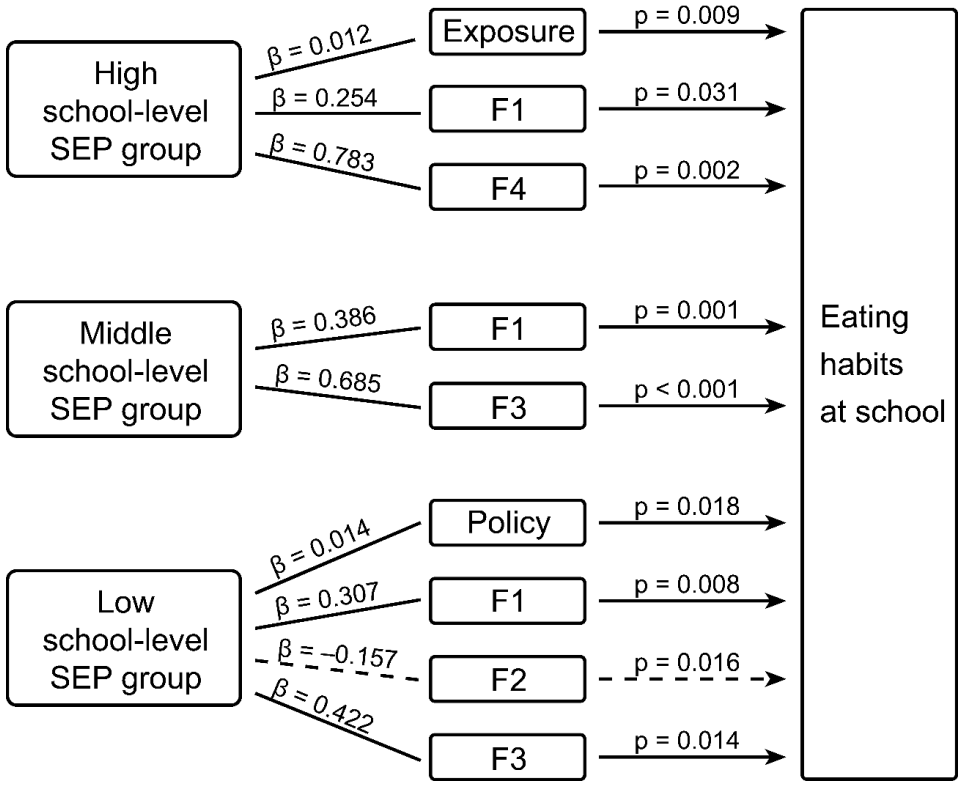

Figure 11. Results of the longitudinal LMM regarding the changes in pupils' eating habits at school among the schools that were included in the combined data (n=360), separate model for each SEP group. The Beta coefficient and p-value are indicated above the arrows. The continuous arrow indicates a positive and dashed arrow a negative contribution.

5.5 Summary of the results

Nearly a third of the schools stopped selling sweet products. The selling of sweets and soft drinks, especially through vending machines, decreased remarkably during the study. Schools' intermediary determinants were associated with each other and with the school-level SEP. Schools' exposure to sweet products correlated with many other intermediary determinants. The decrease in sweet product selling following the national recommendation was similar in each school-level SEP group. Pupils' eating behaviours were better in the schools that had not exposed their pupils to sweet products during this study. School-level intermediary determinants contributed differently to pupils' school-time eating habits in different SEP groups.

6 DISCUSSION

6.1 Main results

After the national recommendation, schools decreased their sale of sweets and soft drinks to the pupils (Aim 1). In addition, schools improved their oral health-promoting policies. Higher-SEP schools sold more often sweet products, and a high school-level SEP was associated with (1) pupils' worse perception of the attitudes and access to intoxicants, (2) eating all elements of the school meal less often, (3) eating unhealthy snacks more often at school, and (4) better toothbrushing frequency (Aim 2a). Furthermore, pupils' perception about the attitudes and access to intoxicants and school health services contributed negatively to the school-level SEP, while the home environment and the pupils' tooth brushing frequency contributed positively to the school-level SEP. The effect of the national recommendation on the sale of sweet products in schools was similar in all school-level SEP groups (Aim 2b).

6.2 Results of the study in relation to previous research

6.2.1 Impacts of the national recommendation on schools' oral health-promoting actions

National recommendations have been used worldwide as a tool to improve the school environment, and they have proven to be effective. The national recommendation investigated in this study also had an impact on schools' oral health-promoting actions, particularly on the sale of sweet products in schools. In Sweden, where the society is rather similar to that of Finland, the proportion of schools selling sweet products decreased from 58% to 10% during the three-year follow-up after the 'Dentists against sweets and soft drinks' project implemented by the Swedish Dental Association (Hörnell *et al.* 2009). The decrease in the sale of sweet products in Sweden was even bigger than it was in Finland following the national recommendation, suggesting that Swedish schools might be better at implementing such guidelines. In British Columbia, Canada, a recommendation was given to restrict what food and beverages can be sold in schools to eliminate high sugar and fat food entirely (Watts *et al.* 2014). Four years after high schools were obligated to implement the recommendation, the schools had implemented the recommendation more often and they had lower odds of having SSBs, baked

goods, chocolates and sweets available. As in Scandinavia, the Canadian society and decision-makers may be receptive to national recommendations.

In the United States, many states have given recommendations or mandates to their schools to improve the nutrition environment in schools. As in the present study, many other studies indicate that recommendations and mandates could decrease the sale of sweet products in schools. Typically, a mandate is a bit stronger policy instrument than a recommendation, but it seems that there are no punishment in the US if a mandate is not followed, meaning that a mandate without punishment can be considered quite similar to a recommendation. In Maine, US, high schools were given a recommendation to decrease the availability of SSBs (Blum *et al.* 2008). The number of intervention and control schools was too low to perform a statistical analysis, but overall the intervention schools decreased their availability of SSBs more than their control counterparts. In Washington, a state mandate was successful in restricting the sale of sweet products (Boles *et al.* 2011). Another instrument stronger than a recommendation was the state nutrition law given to middle and high schools in Massachusetts. It managed to decrease the provision of unhealthy products but did not reach 100% compliance, meaning that the sale of banned products continued in some schools (Gorski *et al.* 2016).

According to this study, the provision of healthy snacks did not decrease even if the sale of sweet products decreased at the same time. In Washington, the state mandate that succeeded in restricting the sale of sweet products in schools also decreased the sale of healthy products (Boles *et al.* 2011). The United States is the largest consumer of carbonated soft drinks in the world and almost nine out of ten high school students had access to soft drinks in schools in 2004 and 2005, indicating that the consumption of soft drinks at school is also more common in the US than in Finland (Hawkes 2010, Johnston *et al.* 2007). It is possible that the sale of soft drinks in US schools may be so established that in order to stop the selling they had to stop the selling of everything. At the time when the FNBE and THL gave the recommendation in Finland, there was an ongoing project called ‘Järkipalaa’ (‘Smart snacks’ in English) encouraging schools to offer and sell healthy snacks and that could support Finnish schools to continue or start the provision of healthy snacks (Järkipalaa 2018). The ‘Järkipalaa’ project is still running. In the case examined in this study, it was positive that the sale of sweets and soft drinks through vending machines almost disappeared because most often those products are available from vending machines throughout the school day, if they are present. If there are unhealthy snacks available from vending machines, pupils could easily choose them instead of buying a healthy snack.

Many studies confirm the finding of this study that national recommendations are an effective intervention instrument in changing the nutrition environment in

schools. The national recommendation targeted at French secondary schools improved the nutritional value of the school meals in schools that had a high compliance with the recommendation (Bertin *et al.* 2012). The US study found out that upper-level recommendations at state level rather than at district level are more effective in decreasing the availability of unhealthy products in schools (Kubik *et al.* 2010). Some studies have also found out that district-level recommendations can also be effective: according to a US study, district-level recommendations regulating vending machines and school stores also managed to decrease the availability of unhealthy products (Larson *et al.* 2016). Another US study has also shown that district-level recommendations regarding school (oral) health-related actions (such as restricting the sale of beverages and offering healthy alternatives) did decrease the soft drink consumption in US high schools (Miller *et al.* 2016).

This study has proved that, at least in Finland, national recommendations can be effective in upper-level comprehensive school (or upper secondary school) settings. In Boston, Massachusetts, district-wide recommendations concerning SSBs decreased the availability of those products in elementary, middle and high schools (Mozaffarian *et al.* 2016). In contrast, Kubik *et al.* (2010), Larson *et al.* (2016) and Palakshappa *et al.* (2016) argue that the recommendations were not as effective in improving the food environment in high schools as they were in elementary and middle schools. As presented before, the consumption of unhealthy products, such as soft drinks, is more common in the US than in Finland or in Europe. Perhaps US high schools think that their students will consume unhealthy products no matter what they do. In this study, schools rarely started to expose their pupils to sweet products if they did not already sell sweet products at the beginning of the study. It seems that once a school makes the decision of not selling sweet products, they do not change their mind that easily.

After the national recommendation, Finnish schools have improved their oral health-promoting policies. According to this study, schools also improved their policies concerning the leaving of the school premises in order to prevent their pupils, for example, from buying unhealthy snacks or eating at fast food restaurants. In US high schools, pupils ate more often at fast food restaurants if their schools had the open-campus policy meaning that they were allowed to leave the school area (Neumark-Sztainer *et al*. 2005). However, another US study found out that students' soft drink consumption was not associated with the closed-campus policy, which means that students are not allowed to leave the school area (Miller *et al.* 2016). Some studies from the US suggest that there are more energy-dense foods available nearby schools with pupils with a lower socioeconomic background (Sturm 2008, Neckerman e*t al.* 2010). Based on these findings, it seems that pupils from lower socioeconomic backgrounds would benefit the most from the closed-campus policy.

6.2.2 Associations of schools' intermediary determinants with each other and with the school-level SEP

Intermediary determinants' associations with each other

In this study, schools' intermediary determinants were associated with each other. The most important finding was that if the school sold sweet products, pupils seemed to consume more unhealthy products during the school day. A cross-sectional study suggests that the school food environment does not have much influence on pupils' soft drink or snack consumption (van der Horst *et al.* 2008). However, several studies, including longitudinal studies, have reported similar findings as in this study that schools' intermediary determinants are associated with each other; for example, selling SSBs in schools has previously been found to be associated with the consumption of SSBs by pupils (Masse *et al.* 2014). According to the study in Maine, United States, although the recommendation decreased the availability of SSBs, it did not change the consumption of SSBs in the intervention schools (Blum *et al.* 2008). This could be due to the fact that at the same time there were other policy initiatives being discussed regarding healthy food choices in Maine public schools. Therefore, also control schools may have been influenced with other policies targeting pupils' SSB consumption.

In this study, schools' better oral health-promoting policy on sweet product selling was associated with eating unhealthy snacks at school less often. Bere *et al.* (2008) have reported similar findings: if the school had rules concerning soft drink consumption, it decreased the odds of pupils' drinking soft drinks at school. Another study from the US indicate that in Minnesota high schools that had adopted recommended policies concerning, for example, the availability of sweet products, pupils decreased their consumption of sugary drinks (Nanney *et al.* 2014).

We found out that if schools sell sweet products, pupils do not tend to eat all the components of the school meal very often. Park *et al.* (2010) have reported similar findings: if a school had a vending machine selling soft drinks, pupils chose more often an unhealthy snack instead of the school meal. In addition, items sold in the vending machines of the schools had an effect on pupils' overall dietary intake (Rovner *et al.* 2011). In US middle schools, if competitive foods are available, pupils eat less often the school meal and do not eat all element of the meal (Templeton *et al.* 2005). These studies confirm the findings of this study that schools' intermediary factors, schools' oral health-promoting actions and pupils' oral health-related factors are associated with each other.

Social gradient in schools' intermediary determinants

As far as I know, this is the first study to support the theoretical framework for oral health inequalities by Watt and Sheiham, showing that there is a social gradient in the intermediary determinants of oral health at the school level.

Based on the findings of this study, Finnish schools with a higher SEP sell more often sweet products to their pupils compared to other schools. Previous studies have also indicated that higher socioeconomic background of the pupils leads to more nutritious food choices at school (Ahmadi *et al.* 2015). Schools with higher-SEP pupils may not think that they have a big problem with sweet products because most of the pupils can make good food choices and the adverse effects of sugary foods are not obvious. The school intake in Finland is socially heterogeneous, which means that in higher SEP schools there are also pupils from a lower socioeconomic background (Karvonen *et al.* 2001). The availability of sweet products in schools and the SEP do affect the sugar intake, food choices and oral health: at the individual level, pupils from lower socioeconomic backgrounds consume more sweet products if there are sweet products available (Maliderou *et al*. 2006). It could be also the case in Finland that pupils from lower socioeconomic backgrounds in high-SEP schools consume more sweet products than their counterparts from higher socioeconomic backgrounds. This could widen the social gradient in general and the gap in oral health between the pupils in high-SEP schools.

In contrast to this study, a US study found out that schools with pupils from lower socioeconomic backgrounds were more likely offered unhealthy products during school day (Nanney *et al.* 2008). In the United States, many schools are private schools unlike in Finland, where almost all schools are publicly funded schools run by local authorities. Many US schools have also 'pouring rights' contracts, which are lucrative contracts between the schools and soft drinks manufacturers and which can account for a large part of the school budget. In exchange, soft drinks manufacturers are allowed to sell their products in schools. A US study suggests that schools with lower socioeconomic background students did not have more pouring rights contracts with soft drink manufacturers compared with higher SEP schools (Johnston *et al.* 2007). However, Johnston *et al.* (2007) found out that students from lower socioeconomic backgrounds were more likely to attend schools where soft drink manufacturers advertise in schools and sponsor school sporting events. Unfortunately, if schools with pupils from lower socioeconomic backgrounds expose their pupils to sweet products or tempt them to use more sweet products, the food environment of pupils may be poor throughout the day, as a low SEP has been linked to poorer nutrition habits.

6.2.3 Changes in intermediary determinants after the national recommendation and the relations to school-level SEP

Based on the framework of oral health inequalities, as a structural determinant and as an upstream factor, national recommendation should not increase inequalities in school sweet product selling (Watt & Sheiham 2012). In this study, the decrease in sweet product selling was similar among all school-level SEP groups. This is in line with the findings of Moore *et al*. (2015), who suggest that school-based interventions concentrating only on the school environment have at least a neutral effect on the social gradient.

There have been mixed results in previous studies as to whether school-based interventions increase or decrease inequalities by SEP. According to a French study, a school-based intervention to increase physical activity was successful in reducing the increase in BMI, and there were no differences between the participants based on their SEP (Simon *et al.* 2008). One reason for this could be that the school systems in European countries, such as in France and in Finland, have some elements that do not generate inequalities as easily as in some other countries. A systematic review by Lorenc *et al.* (2013) found out that school-based interventions related to healthy eating alone or combined with other actions could be neutral in terms of social gradient or could increase inequalities. Another review concludes that nutrition interventions at schools may widen inequalities (Oldroyd *et al.* 2008). Maybe too often, interventions on nutrition and healthy eating in schools require active choosing from pupils between the foods, leading to situation that pupils from higher SEP families make better choices compared to other pupils, which could generate health inequalities. This could be the case in the German quasi-randomised, controlled trial with an eight-year follow-up, in which a school-based health promotion intervention had favourable effects on BMI but only among students from high-SEP families (Plachta-Danielzik *et al.* 2011).

There are mixed results from the United States compared to the finding of this study that a national recommendation does not increase inequalities in terms of the sale of sweet products. A state mandate targeting schools was more effective in decreasing the sale of SSBs than district-wide recommendations, especially among African American students (Terry-McElrath *et al.* 2015). This encourages the use of national recommendations and statewide mandates to promote healthy eating at schools. In a Californian study, it was found out that the recommendations concerning competing foods and beverages in schools improved the trends of the child overweight/obesity prevalence in all socioeconomic groups (Sanchez-Vaznaugh *et al.* 2015). However, the overweight/obesity trend improvement evened in the low- and middle-SEP school groups but declined in the high-SEP

school group, indicating that such a recommendation could increase the social gradient in overweight/obesity prevalence, at least in that population.

6.3 Strengths and weaknesses of the study

The strength of the study is the longitudinal design that makes it possible to measure the intervention effects of the national recommendation. However, since the study was an ecological one, care must be taken when drawing assumptions about individual effects on pupils based on the findings of this study.

Another strength of the study was that the study used two independent datasets. The school principal or personnel answered the questionnaire concerning the school's oral health-related actions (the SSSS survey) and pupils answered the SHPS questionnaire concerning their oral health-related behaviours independently of each other. Therefore, the combined data makes the study even more valid at the school level. In addition, the SHPS is a traditional and respected survey among upper-level comprehensive schools in Finland and attracts an excellent response rate every year. However, the total response rate of the combined data was quite small due to the low response rate in the SSSS survey. The weakness of the study was that the questionnaires' self-reporting nature could lead to potential bias. For example, the principal or school personnel could underestimate the sale of sweet products in their school, or pupils could under- or overestimate their eating habits at school. On the other hand, differences between schools are smaller than differences between individuals. In this study, the distribution of the responding schools' geographical location, size and teaching language were similar to the geographical location, size and teaching language of all the schools in Finland. The study population can be considered to be sufficiently representative to allow the generalisation of the results to all Finnish upper-level comprehensive schools.

Another weakness of the study was that the dataset of oral health behaviours was obtained through a secondary analysis of the data from the SHPS, including only school-level means. We could not include the questions we wanted in the SHPS but could only use the existing questions to form the school-level SEP and the factors describing the intermediary determinants of oral health inequalities. In addition to the strongest key marker of SEP, parental education, we felt it appropriate to include income-related measures to describe the school-level SEP, as Finland does not have as clear social classes compared, for example, to the United Kingdom (Karvonen *et al.* 2001). The income-related measures, such as parental lay-off, family structure (one-parent families have more often less money available to their children, too) and the amount of pocket-money, were used to describe more specifically the possibilities these adolescents have and to make the

measurement of the school-level SEP more robust compared to a situation where only parental education was measured. The distributions of the school-level SEP in combined data were very close to the distributions of the school-level SEP in all schools that had answered the SHPS, indicating that the selection bias is very similar.

6.4 Significance of the study to science and public health practice

The findings of this thesis support the use of upstream-level recommendations, at least on a national level, to improve schools' food environments. The results of the study also support the current view that school policies and actions concerning sweet products are a very important issue and could affect adolescents' sugar consumption (Rugg-Gunn 2017).

It is well known what kind of interventions work in school settings. This study suggests that national recommendations can decrease the sale of sweet products to pupils in schools. It also seems that, at least in Finland, the effect of national recommendations on the sale of sweet products in schools is similar across all school-level SEP groups. The findings of this study could encourage decision-makers to give recommendations to schools to improve their nutrition environment because it is unlikely that such recommendations would increase inequalities in terms of sweet selling.

In this study, pupils in the schools that had sold sweet products during the intervention had worse eating habits at school compared to their peers in schools that did not sell sweet products at all. Several studies indicate that the school food environment influences pupils' nutrition habits (Bere *et al.* 2010, Masse *et al.* 2014, Nanney *et al.* 2014, Park *et al.* 2010, Rovner *et al.* 2011, Templeton *et al.* 2005). Therefore, national recommendations may also impact pupils' oral health in the long-term.

The school environment is not the only environment that needs to be taken into account in order to improve children and adolescents' eating habits. A systematic review by Boelsen-Robinson *et al.* (2015) discusses an Australian study where school nutrition recommendations formed one element of the 'Be Active, Eat Well' campaign together with other community actions. The most effective interventions in a school setting have been those that take into account the nutrition policy of the school on the whole, including access to food outside the school area (Jaime & Lock 2009).

Based on this study, the national recommendation did not succeed to eradicate the sale of sweet products in schools. The reason for this could be that unhealthy snacking is so established in some schools that it is not that easy to stop the selling of sweet products. Sometimes stricter actions are needed. Spain has banned the sale of products containing lots of saturated fat, trans-fat, salt or sugar in schools (de Lago 2011). In the EU, school-based interventions have achieved short-term narrowing inequalities in SSB consumption, however, SSB taxation has been found to be a more effective instrument (Health Equity Pilot Project 2017). At population level, tax on SSBs has proved to be an effective way to decrease the overall consumption of SSBs (Colchero *et al.* 2016).

6.5 Recommendations for action

- Especially adolescents with a lower SEP suffer the most from an unhealthy nutrition environment in schools. Therefore, a healthy nutrition environment in schools should be the goal when aiming to improve the position of those who would benefit from a healthy school environment the most.

- Schools need support and advice from authorities (state, regional, municipal) and health professionals to make decisions that can promote pupils' health. There is always some degree of resistance to change from pupils, school staff and parents concerning issues such as the availability sweet products to pupils. Authorities and health professionals should offer arguments to schools on which they can lean when implementing the changes.

- To decrease the sale of sweet products in Finnish upper-level comprehensive schools, a new and more comprehensive national recommendation for schools concerning the sale of sweet products is needed.

- To improve the school nutrition environment as a whole, the implementation of the previous recommendations, such as the school meal recommendation issued in 2017, should be continued and possibly supplemented with further recommendations.

- To end the sale of sweet products in schools and to make the nutrition environment in schools healthier, stricter actions such as legislation prohibiting the sale and provision of unhealthy products in schools may be needed.

7 CONCLUSIONS

The national recommendation did affect Finnish schools' oral health-promoting actions. It proved particularly successful in reducing the sale of sweet products in Finnish upper-level comprehensive schools. In addition, the present study indicates that schools' intermediary determinants seem to be associated with each other and with the school-level SEP, and several intermediary factors seem to contribute to the school-level SEP. Furthermore, it seems that the national recommendation did not reduce or increase inequalities concerning the sale of sweet products in schools. It is also possible that sweet selling in schools has affected pupils' eating habits during school hours.

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APPENDICES

Appendix 1. The questionnaire of the School Sweet Selling Survey in Finnish. For translation and validation in English, please contact the author.

Tutkimus virvoitusjuomien ja makeisten myynnistä perusopetuksen vuosiluokkien 7-9 kouluissa (yläkouluissa) 2007

1. Koulun nimi _____
   Lääni _____
   Kunta _____

2. Koulun oppilasmäärä?
   - o alle 99
   - o 100–299
   - o 300–499
   - o yli 500

3. Toimiiko yläkoulun kanssa samoissa tiloissa myös 1-6 vuosiluokkien koulu(alakoulu)?
   - o Kyllä
   - o Ei

4. Voivatko oppilaat ostaa koulusta syötävää tai juotavaa. esim. kahvilasta, kioskista, automaateista tai ruokalasta?
   - o Kyllä *Jos vastasit kyllä, siirry suoraan kysymykseen 6.*
   - o Ei *Jos vastasit ei, vastaa kysymykseen 5.*

5. Mikä on tärkein syy, jonka vuoksi koulussa ei ole myyntiä?
   - o Koululla on tehty linjaus, joka on myynnin vastainen
     Jos vastasit, että koululla on linjaus, siirry kysymykseen 25.
   - o Muu syy, mikä?
     _____
     Jos vastasit muun syyn, siirry kysymykseen 29.

6. Onko koulussa juoma-automaatti, joka on kouluaikana oppilaiden käytössä?
   - o Kyllä *Jos vastasit kyllä, vastaa kysymyksiin 7 ja 8.*
   - o Ei *Jos vastasit ei, siirry suoraan kysymykseen 9.*

7. Myydäänkö juoma-automaatissa
   - o tavallisia virvoitusjuomia
   - o keinomakeutettuja virvoitusjuomia (ns. Light-tuotteita)
   - o makeutettuja mehuja
   - o ei mitään edellisistä

   Voit valita yhden tai useamman vaihtoehdon.

8. Näkyvätkö juoma-automaatissa tuotemerkit (esim. CocaCola).
   - o Kyllä
   - o Ei

9. Onko koulussa jokin muu automaatti, joka on kouluaikana oppilaiden käytössä?
   - o Kyllä *Jos vastasit kyllä, vastaa kysymyksiin 10 ja 11.*
   - o Ei *Jos vastasit ei, siirry suoraan kysymykseen 12.*

10. Myydäänkö automaatissa makeisia?
    - o Kyllä
    - o Ei

11. Näkyvätkö automaatissa tuotemerkit (esim. Mars)?
    - o Kyllä
    - o Ei

12. Onko koulussa kioski?
    - o Kyllä *Jos vastasit kyllä, vastaa kysymykseen 13.*
    - o Ei *Jos vastasit ei, siirry suoraan kysymykseen 14.*

13. Myydäänkö kioskissa
    - o tavallisia virvoitusjuomia
    - o keinomakeutettuja virvoitusjuomia (ns. Light-tuotteita)
    - o makeutettuja mehuja
    - o makeisia
    - o ei mitään edellisistä

    Voit valita yhden tai useamman vaihtoehdon.

14. Onko koulussa kahvila?
    - o Kyllä *Jos vastasit kyllä, vastaa kysymykseen 15.*
    - o Ei *Jos vastasit ei, siirry suoraan kysymykseen 16.*

15. Myydäänkö kahvilassa
    - o tavallisia virvoitusjuomia
    - o keinomakeutettuja virvoitusjuomia (ns. Light-tuotteita)
    - o makeutettuja mehuja
    - o makeisia
    - o leivoksia, munkkeja, pullia tai keksejä?
    - o ei mitään edellisistä

    Voit valita yhden tai useamman vaihtoehdon.

16. Myydäänkö koulun ruokalassa
    - o tavallisia virvoitusjuomia
    - o keinomakeutettuja virvoitusjuomia (ns. Light-tuotteita)
    - o makeutettuja mehuja
    - o makeisia
    - o leivoksia, munkkeja, pullia tai keksejä?
    - o ei mitään edellisistä

    Voit valita yhden tai useamman vaihtoehdon.

17. Mikäli koulussa myydään makeita syötäviä tai juotavia, mikä on tärkein syy siihen?
    - o Koulussa ei myydä makeita syötäviä eikä juotavia

    Jos vastasit, että koulussa ei myydä syötäviä eikä juotavia, siirry suoraan kysymykseen 20.

    - o Oppilaiden toivomus
    - o Vanhempien toivomus
    - o On parempi, että ostetaan koulusta kuin koulun ulkopuolella sijaitsevasta kaupasta tai kioskista
    - o Muu syy, mikä?

    _____

    Jos vastasit jotain muuta, jatka kysymykseen 18.

18. Kuka/ketkä vastaavat makeiden syötävien tai juotavien myynnistä koulussa?
    Voit valita yhden tai useamman vaihtoehdon.
    - o Koulu
    - o Oppilaskunta
    - o Opettajayhdistys
    - o Vanhempainyhdistys
    - o Ulkopuolinen yritys
    - o Hyväntekeväisyysjärjestö
    - o Joku muu, mikä_____

19. Kuka/ketkä saavat makeiden syötävien tai juotavien myynnin tulot?
    Voit valita yhden tai useamman vaihtoehdon.
    - o Koulu
    - o Oppilaskunta
    - o Opettajayhdistys
    - o Vanhempainyhdistys
    - o Ulkopuolinen yritys
    - o Hyväntekeväisyysjärjestö
    - o Joku muu, mikä_____

20. Myydäänkö koulussa hedelmiä, voileipiä tai muita terveellisiä välipaloja?
    - o Kyllä *Jos vastasit kyllä, siirry suoraan kysymykseen 22.*
    - o Ei *Jos vastasit ei, vastaa kysymykseen 21.*

21. Mikä on tärkein syy siihen, että koulussa ei myydä terveellisiä välipaloja?
    - o Koulu tarjoaa terveellisen välipalan.
    - o Oppilaat ottavat terveellisen välipalan tarpeen vaatiessa kotoa mukaansa.
    - o Oppilaat eivät ole kyselleet terveellisiä välipaloja.
    - o Vanhemmat eivät ole kyselleet terveellisiä välipaloja
    - o Muu syy, mikä?

    _____

22. Oletteko tehneet muutoksia myynnissä viimeisen kahden vuoden aikana?
Voit valita yhden tai useamman vaihtoehdon.
- o Emme *Jos vastasit emme, siirry suoraan kysymykseen 24.*
- o Kyllä, myymme nykyisin pelkästään hedelmiä, voileipiä tai maitotuotteita.
- o Kyllä, olemme lopettaneet virvoitusjuomien myynnin.
- o Kyllä, olemme lopettaneet makeisten myynnin.
- o Kyllä, olemme lopettaneet muiden makeiden syötävien/juotavien, kuten mehujen, leivosten ja pullien myynnin.
- o Kyllä, olemme vähentäneet virvoitusjuomien tarjontaa.
- o Kyllä, olemme vähentäneet makeisten tarjontaa.
- o Kyllä, olemme vähentäneet muiden makeiden syötävien/juotavien, kuten mehujen, leivosten ja pullien tarjontaa.
- o Kyllä, olemme aloittaneet virvoitusjuomien myynnin.
- o Kyllä, olemme aloittaneet makeisten myynnin.
- o Kyllä, olemme aloittaneet muiden makeiden syötävien/juotavien, kuten mehujen, leivosten ja pullien myynnin
- o Kyllä, olemme tehneet jotain muuta, mitä?

_____

Jos vastasit kyllä, vastaa kysymykseen 23.

23. Mikä on pääasiallinen syy siihen, että järjestelyjä on muutettu?

_____

24. Onko koululla jonkinlaista linjausta koskien virvoitusjuomien, makeisten ja muiden makeiden syötävien/juotavien myyntiä ja/tai nauttimista koulussa?
- o Kyllä *Jos vastasit kyllä, jatka kysymykseen 25.*
- o Ei *Jos vastasit ei, siirry suoraan kysymykseen 29.*

25. Mitä linjaus pitää sisällään?
Voit valita yhden tai useamman vaihtoehdon.
- o Oppitunneilla ei nautita virvoitusjuomia eikä makeisia
- o Koulussa ei nautita virvoitusjuomia eikä makeisia
- o Koulussa ei myydä virvoitusjuomia eikä makeisia
- o Koulussa ei myydä lainkaan makeita tuotteita
- o Koulussa ei myydä mitään
- o Myyntipisteissä myydään terveellisiä tuotteita
- o Vähennetään makeita tuotteita kahvilan valikoimasta
- o Rajoitetaan kahvilan aukioloaikoja
- o Ohjataan oppilaita syömään kouluruokaa
- o Koulu tarjoaa terveellisen välipalan
- o Muuta, mitä?

_____

26. Ketkä päättävät koulun linjauksesta?
Mikäli linjaus on tehty yhdessä, valitse kaikki päätökseen osallistuneet tahot.
- o Kunta
- o Opettajat
- o Oppilaat
- o Vanhemmat
- o Muu taho, mikä?_____

27. Onko linjaus muuttunut kahden viimeisen vuoden aikana?
    - o Kyllä *Jos vastasit kyllä, vastaa kysymykseen 28.*
    - o Ei *Jos vastasit ei, siirry suoraan kysymykseen 29.*

28. Miten ja mistä syystä linjaus on muuttunut?

    _____

29. Onko oppilailla lupa käydä ostamassa syötävää tai juotavaa koulualueen ulkopuolelta esim. kaupasta tai kioskista?
    - o Kyllä, ruokatunnilla
    - o Kyllä, välitunnilla
    - o Kyllä, milloin tahansa
    - o Ei, ja poistumista pystytään valvomaan
    - o Ei, mutta oppilaat käyvät siitä huolimatta

30. Mistä oppilaat saavat vettä juodakseen koulupäivän aikana?
    Voit valita yhden tai useamman vaihtoehdon.
    - o ostamalla juoma-automaatista
    - o koulun käytävillä olevista vedenjuontipisteistä
    - o ruokalasta ruokatunnin aikana
    - o ruokalasta muulloinkin kuin ruokatunnin aikana
    - o vessan tai pukuhuoneiden hanoista
    - o jostain muualta, mistä? _____

31. Miten koulussanne suhtaudutaan ksylitolipurukumin/-pastillin käyttöön/tarjontaan kouluaikana? *Voit valita yhden tai useamman vaihtoehdon.*

    - o Purukumin käyttö on kielletty johtuen sotkemisesta
    - o Purukumia saa pureskella välitunnilla
    - o Purukumia saa pureskella ruokatunnilla
    - o Purukumia saa pureskella milloin tahansa
    - o Koulu tarjoaa ksylitolipurukumin ruokailun jälkeen
    - o Koulu tarjoaa ksylitolipastillin ruokailun jälkeen
    - o Koulusta on mahdollisuus ostaa ksylitolipurukumia/-pastilleja
    - o Koulussa on ksylitolipurukumi/-pastilliautomaatti
    - o Muuten, miten?

    _____

32. Muita kommentteja _____

33. Päivämäärä _____
    Vastaajan tehtävä koulussa _____
    Koulun puhelinnumero _____
    Koulun sähköposti _____

Appendix 2. The questions of the School Health Promotion Study questionnaire in Finnish. For translation and validation in English, please contact the author.

STAKES

Kouluterveyskysely 2007

Sosiaali- ja terveysalan tutkimus- ja kehittämiskeskus
Stakes
Kouluterveyskysely
PL 220
00531 Helsinki

Tiedonkeruusta vastaa
Erikoistutkija
Minna Pietikäinen

Hei!
Kouluterveyskyselyssä kerätään tietoja koulukokemuksista, koulujen ja oppilaiden työoloista sekä oppilaiden terveydestä ja elämäntavoista. Kysely tehdään huhtikuussa 2007 useissa kunnissa peruskoulujen 8. ja 9. luokille sekä lukioiden 1. ja 2. vuosikursseille. Tuloksia käytetään nuorten hyvinvoinnin edistämisessä sekä koulutyön ja terveydenhuollon kehittämisessä.

Vastaaminen on vapaaehtoista. Älä kirjoita nimeäsi lomakkeeseen. Kysely on nimetön ja luottamuksellinen. Tuloksia käsitellään vain tilastollisesti. Lomakkeet suljetaan kirjekuoreen, joka lähetetään koulusta suljettuna tallennuskeskukseen. Tallennuksen jälkeen lomakkeet hävitetään.

Jos kysymykset jäävät askarruttamaan Sinua, keskustele niistä vanhempiesi kanssa tai ota yhteyttä opettajaasi tai kouluterveydenhoitajaan.

Tutkimuksen tulokset valmistuvat syksyllä 2007. Ne julkaistaan koulu- ja kuntakohtaisesti tutkimuksen tilaaville kunnille sekä maakunta- ja läänikohtaisesti nettisivuillamme *info.stakes.fi/kouluterveyskysely*.

Huhtikuussa 2007

Minna Pietikäinen

Minna Pietikäinen
erikoistutkija

Täyttöohjeet

Lue ensin koko kysymys. Vastaa merkitsemällä rasti oikeaan tai sopivimman vaihtoehdon mukaiseen ruutuun. Käytä pehmeää lyijykynää (tai kuulakärkikynää tai mustekynää).
Virheen sattuessa älä käytä pyyhekumia, vaan täytä väärin merkitsemäsi ruutu kokonaan ja rastita oikea vaihtoehto. Näin:

■ virhe ☒ oikea

Joidenkin kysymysten jälkeen huomautetaan, että voit siirtyä suoraan numerolla ilmoitettuun kysymykseen. Tällöin Sinun ei tarvitse vastata väliin jääviin kysymyksiin.

Esimerkki: Jos keskiarvosi olisi 7,2, vastaisit oheiseen kysymykseen näin:

Mikä oli keskiarvosi (kaikki aineet) viime todistuksessasi?

☐ < 6,5	☐ 8,0 - 8,4
☐ 6,5 - 6,9	☐ 8,5 - 8,9
☒ 7,0 - 7,4	☐ 9,0 - 9,4
☐ 7,5 - 7,9	☐ 9,5 - 10,0

Sivujen reunoissa on merkkejä ja numeroita, joita tarvitaan lomakkeen optisessa tallennuksessa.

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STAKES **Kouluterveyskysely** | Erikoistutkija Minna Pietikäinen | 2/12

1. Sukupuoli

☐ poika ☐ tyttö

2. Syntymäkuukausi ja -vuosi

☐ tammi
☐ helmi
☐ maalis
☐ huhti
☐ touko
☐ kesä
☐ heinä
☐ elo
☐ syys
☐ loka
☐ marras
☐ joulu

☐ 1987 tai aiemmin
☐ 1988
☐ 1989
☐ 1990
☐ 1991
☐ 1992
☐ 1993
☐ 1994 tai myöhemmin

3. Koulu tai oppilaitos

☐ peruskoulu, 8. luokka
☐ peruskoulu, 9. luokka
☐ lukio, 1. vuosikurssi
☐ lukio, 2. vuosikurssi
☐ lukio, 3. vuosikurssi

KOULUTYÖ

4. Mitä pidät koulunkäynnistä tällä hetkellä? Pidän koulunkäynnistä

☐ hyvin paljon
☐ melko paljon
☐ melko vähän
☐ en lainkaan

5. Millaiseksi olet kokenut koulutyöhön liittyvän työmääräsi tämän lukuvuoden aikana?

☐ jatkuvasti liian suuri
☐ melko usein liian suuri
☐ sopiva
☐ melko usein liian vähäinen
☐ jatkuvasti liian vähäinen

6. Mikä oli keskiarvosi (kaikki aineet) viime todistuksessasi?

☐ < 6,5
☐ 6,5 - 6,9
☐ 7,0 - 7,4
☐ 7,5 - 7,9
☐ 8,0 - 8,4
☐ 8,5 - 8,9
☐ 9,0 - 9,4
☐ 9,5 - 10,0

7. Lue jokainen seuraavista väittämistä huolellisesti. Merkitse se vaihtoehto, joka parhaiten kuvaa omaa mielipidettäsi. Vastaa joka kohtaan.

	Täysin samaa mieltä	Samaa mieltä	Eri mieltä	Täysin eri mieltä
Opettajat rohkaisevat minua ilmaisemaan oman mielipiteeni oppitunneilla	☐	☐	☐	☐
Opettajat ovat kiinnostuneita siitä, mitä minulle kuuluu	☐	☐	☐	☐
Opettajani odottavat minulta liikaa koulussa	☐	☐	☐	☐
Opettajat kohtelevat meitä oppilaita oikeudenmukaisesti	☐	☐	☐	☐
Luokkani oppilaat viihtyvät hyvin yhdessä	☐	☐	☐	☐
Luokassani on hyvä työrauha	☐	☐	☐	☐
Oppilaiden mielipiteet otetaan huomioon koulutyön kehittämisessä	☐	☐	☐	☐
Tiedän, miten koulussani voin vaikuttaa koulun asioihin	☐	☐	☐	☐

8. Haittaavatko seuraavat seikat työskentelyäsi koulussa? Vastaa joka kohtaan.

	Ei lainkaan	Melko vähän	Melko paljon	Erittäin paljon
Opiskelutilojen ahtaus	☐	☐	☐	☐
Melu, kaiku	☐	☐	☐	☐
Sopimaton valaistus	☐	☐	☐	☐
Huono ilmanvaihto tai huoneilma	☐	☐	☐	☐
Lämpötila (kuumuus, kylmyys, veto)	☐	☐	☐	☐
Likaisuus, pölyisyys	☐	☐	☐	☐
Epämukavat työtuolit tai -pöydät	☐	☐	☐	☐
Huonot sosiaalitilat (WC, pukeutumis- ja peseytymistilat)	☐	☐	☐	☐
Työympäristön rauhattomuus	☐	☐	☐	☐
Kiireisyys	☐	☐	☐	☐
Väkivaltatilanteet	☐	☐	☐	☐
Tapaturmavaara	☐	☐	☐	☐

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9. Miten koulunkäyntisi sujuu? Onko Sinulla vaikeuksia seuraavissa asioissa? Vastaa joka kohtaan.

	Ei lainkaan	Melko vähän	Melko paljon	Erittäin paljon
Opetuksen seuraaminen oppitunneilla	☐	☐	☐	☐
Työskentely ryhmissä	☐	☐	☐	☐
Läksyjen tai muiden vastaavien tehtävien tekeminen	☐	☐	☐	☐
Kokeisiin valmistautuminen	☐	☐	☐	☐
Itselleni parhaiten sopivan opiskelutavan löytäminen	☐	☐	☐	☐
Omatoimisuutta vaativien tehtävien aloittaminen tai valmiiksi hoitaminen	☐	☐	☐	☐
Kirjoittamista vaativien tehtävien tekeminen	☐	☐	☐	☐
Lukemista (esim. kirjasta) vaativien tehtävien tekeminen	☐	☐	☐	☐
Koulukavereiden kanssa toimeentuleminen	☐	☐	☐	☐
Opettajien kanssa toimeentuleminen	☐	☐	☐	☐

10. Jos Sinulla on vaikeuksia koulunkäynnissä ja opiskelussa, kuinka usein saat apua? Vastaa molempiin kohtiin.

	Aina kun tarvitsen	Useimmiten	Harvoin	En juuri koskaan
Koulussa	☐	☐	☐	☐
Kotona	☐	☐	☐	☐

11. Jos Sinulla on muita kuin koulunkäyntiin liittyviä ongelmia, kuinka hyvin saat niihin apua seuraavilta henkilöiltä? Vastaa joka kohtaan.

	Erittäin hyvin	Melko hyvin	Melko huonosti	Erittäin huonosti
Terveydenhoitajalta	☐	☐	☐	☐
Lääkäriltä	☐	☐	☐	☐
Koulupsykologilta	☐	☐	☐	☐
Koulukuraattorilta	☐	☐	☐	☐
Opettajalta	☐	☐	☐	☐

12. Kuinka monta kokonaista koulupäivää olet ollut seuraavien syiden takia poissa VIIMEISTEN 30 PÄIVÄN aikana? Vastaa joka kohtaan.

	En yhtään	Yhden päivän	2-3 päivää	Yli 3 päivää
Sairauden takia	☐	☐	☐	☐
Pinnaamisen tai lintsauksen takia	☐	☐	☐	☐
Muista syistä	☐	☐	☐	☐

13. Oletko kokenut seuraavanlaisia tunteita koulutyöhösi liittyen? Vastaa joka kohtaan.

	Ei juuri koskaan	Muutaman kerran kuussa	Muutamana päivänä viikossa	Lähes päivittäin
Tunnen hukkuvani koulutyöhön	☐	☐	☐	☐
Tuntuu, ettei opinnoillani ole enää merkitystä	☐	☐	☐	☐
Minulla on riittämättömyyden tunteita opinnoissani	☐	☐	☐	☐

KOULUKIUSAAMINEN

Kiusaamisella tarkoitetaan tässä sitä, kun toinen oppilas tai ryhmä oppilaita sanoo tai tekee epämiellyttäviä asioita jollekin oppilaalle. Kiusaamista on myös se, kun oppilasta kiusoitellaan toistuvasti tavalla, josta hän ei pidä. Kiusaamista ei ole se, kun kaksi suunnilleen samanvahvuista oppilasta riitelevät.

14. Kuinka usein Sinua on kiusattu koulussa tämän LUKUKAUDEN aikana?

- ☐ useita kertoja viikossa
- ☐ noin kerran viikossa
- ☐ harvemmin
- ☐ ei lainkaan

15. Kuinka usein Sinä olet osallistunut muiden oppilaiden kiusaamiseen tämän LUKUKAUDEN aikana?

- ☐ useita kertoja viikossa
- ☐ noin kerran viikossa
- ☐ harvemmin
- ☐ ei lainkaan

STAKES **Kouluterveyskysely** | Erikoistutkija Minna Pietikäinen | 4/12

16. Jos sinua on kiusattu tai olet osallistunut muiden oppilaiden kiusaamiseen tämän LUKUVUODEN aikana, onko tilanteeseen puututtu koulun aikuisten toimesta?

☐ ei ☐ kyllä

TERVEYS

17. Mitä mieltä olet terveydentilastasi? Onko se

☐ erittäin hyvä
☐ melko hyvä
☐ keskinkertainen
☐ melko tai erittäin huono

18. Onko Sinulla viimeksi kuluneen PUOLEN VUODEN aikana ollut jotakin seuraavista oireista ja kuinka usein? Vastaa joka kohtaan.

	Harvoin tai ei lainkaan	Noin kerran kuussa	Noin kerran viikossa	Lähes joka päivä
Niska- tai hartiakipuja	☐	☐	☐	☐
Selän alaosan kipuja	☐	☐	☐	☐
Vatsakipuja	☐	☐	☐	☐
Jännittyneisyyttä tai hermostuneisuutta	☐	☐	☐	☐
Ärtyneisyyttä tai kiukunpurkauksia	☐	☐	☐	☐
Vaikeuksia päästä uneen tai heräilemistä öisin	☐	☐	☐	☐
Päänsärkyä	☐	☐	☐	☐
Väsymystä tai heikotusta	☐	☐	☐	☐

19. Onko Sinulla jokin LÄÄKÄRIN TOTEAMA pitkäaikainen sairaus, vika tai vamma, joka haittaa jokapäiväistä toimintaasi?

☐ ei ☐ kyllä

20. Kuinka monta kertaa olet tämän LUKUVUODEN aikana käynyt koulusi lääkärin tai terveydenhoitajan vastaanotolla? Vastaa molempiin kohtiin.

	En lainkaan	Kerran	Kaksi kertaa	3 kertaa tai useammin
Lääkärin	☐	☐	☐	☐
Terveydenhoitajan	☐	☐	☐	☐

21. Kuinka hyvin koulusi terveydenhuolto toimii silloin, kun oppilaat haluavat keskustella henkilökohtaisista asioistaan (esim. seksi, masennus)? Oletko siihen

☐ erittäin tyytyväinen
☐ melko tyytyväinen
☐ melko tyytymätön
☐ erittäin tyytymätön

22. Jos jostakin syystä haluaisit mennä koulusi lääkärin, terveydenhoitajan, kuraattorin tai psykologin vastaanotolle, miten helppo sinne on mielestäsi päästä? Vastaa joka kohtaan.

	Erittäin helppo	Melko helppo	Melko vaikea	Erittäin vaikea
Kouluterveydenhoitajalle	☐	☐	☐	☐
Koululääkärille	☐	☐	☐	☐
Koulukuraattorille	☐	☐	☐	☐
Koulupsykologille	☐	☐	☐	☐

23. Pituus ja paino (merkitse selkein numeroin)

Pituus ☐☐☐ cm Paino ☐☐☐ kg

MIELIALA

Seuraavat kysymykset käsittelevät mielialan erilaisia piirteitä. Vastaa kuhunkin kysymykseen siten, millaiseksi tunnet itsesi tänään. Valitse kustakin kysymyksestä vain yksi vaihtoehto. Joku kysymys voi tuntua Sinusta yllättävältä. Toivomme kuitenkin, että vastaat kaikkiin kysymyksiin.

24. Minkälainen on mielialasi?

☐ mielialani on melko valoisa ja hyvä
☐ en ole alakuloinen tai surullinen
☐ tunnen itseni alakuloiseksi ja surulliseksi
☐ olen alakuloinen jatkuvasti enkä pääse siitä
☐ olen niin masentunut ja alavireinen, etten kestä enää

25. Miten suhtaudut tulevaisuuteen?

☐ suhtaudun tulevaisuuteeni toiveikkaasti
☐ en suhtaudu tulevaisuuteeni toivottomasti
☐ tulevaisuus tuntuu minusta melko masentavalta
☐ minusta tuntuu, ettei minulla ole tulevaisuudelta mitään odotettavaa
☐ tulevaisuus tuntuu minusta toivottomalta, enkä jaksa uskoa, että asiat muuttuisivat parempaan päin

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26. Miten katsot elämäsi sujuneen?

- ☐ olen elämässäni onnistunut huomattavan usein
- ☐ en tunne epäonnistuneeni elämässä
- ☐ minusta tuntuu, että olen epäonnistunut pyrkimyksissäni tavallista useammin
- ☐ elämäni on tähän saakka ollut vain sarja epäonnistumisia
- ☐ tunnen epäonnistuneeni täydellisesti ihmisenä

27. Miten tyytyväiseksi tai tyytymättömäksi tunnet itsesi?

- ☐ olen varsin tyytyväinen elämääni
- ☐ en ole erityisen tyytymätön
- ☐ en nauti asioista samalla tavalla kuin ennen
- ☐ minusta tuntuu, etten saa enää tyydytystä juuri mistään
- ☐ olen täysin tyytymätön kaikkeen

28. Minkälaisena pidät itseäsi?

- ☐ tunnen itseni melko hyväksi
- ☐ en tunne itseäni huonoksi ja arvottomaksi
- ☐ tunnen itseni huonoksi ja arvottomaksi melko usein
- ☐ nykyään tunnen itseni arvottomaksi melkein aina
- ☐ olen kerta kaikkiaan arvoton ja huono

29. Onko Sinulla pettymyksen tunteita?

- ☐ olen tyytyväinen itseeni ja suorituksiini
- ☐ en ole pettynyt itseni suhteen
- ☐ olen pettynyt itseni suhteen
- ☐ minua inhottaa oma itseni
- ☐ vihaan itseäni

30. Miten suhtaudut vieraitten ihmisten tapaamiseen?

- ☐ pidän ihmisten tapaamisesta ja juttelemisesta
- ☐ en ole menettänyt kiinnostustani muihin ihmisiin
- ☐ toiset ihmiset eivät enää kiinnosta minua niin paljon kuin ennen
- ☐ olen melkein kokonaan menettänyt mielenkiintoni sekä tunteeni toisia ihmisiä kohtaan
- ☐ olen menettänyt mielenkiintoni muihin ihmisiin, enkä välitä heistä lainkaan

31. Miten koet päätösten tekemisen?

- ☐ erilaisten päätösten tekeminen on minulle helppoa
- ☐ pystyn tekemään päätöksiä samoin kuin ennenkin
- ☐ varmuuteni on vähentynyt ja yritän lykätä päätösten tekoa
- ☐ minulla on suuria vaikeuksia päätösten teossa
- ☐ en pysty enää lainkaan tekemään ratkaisuja ja päätöksiä

32. Minkälaisena pidät olemustasi ja ulkonäköäsi?

- ☐ olen melko tyytyväinen ulkonäköön ja olemukseeni
- ☐ ulkonäössäni ei ole minua haittaavia piirteitä
- ☐ olen huolissani siitä, että näytän epämiellyttävältä
- ☐ minusta tuntuu, että näytän rumalta
- ☐ olen varma, että näytän rumalta ja vastenmieliseltä

33. Minkälaista nukkumisesi on?

- ☐ minulla ei ole nukkumisessa minkäänlaisia vaikeuksia
- ☐ nukun yhtä hyvin kuin ennenkin
- ☐ herätessäni aamuisin olen paljon väsyneempi kuin ennen
- ☐ minua haittaa unettomuus
- ☐ kärsin unettomuudesta, nukahtamisvaikeuksista tai liian aikaisin kesken unien heräämisestä

34. Tunnetko väsymystä ja uupumusta?

- ☐ väsyminen on minulle lähes täysin vierasta
- ☐ en väsy helpommin kuin tavallisestikaan
- ☐ väsyn nopeammin kuin ennen
- ☐ vähäinenkin työ väsyttää ja uuvuttaa minua
- ☐ olen liian väsynyt tehdäkseni mitään

35. Minkälainen ruokahalusi on?

- ☐ ruokahalussani ei ole mitään hankaluuksia
- ☐ ruokahaluni on ennallaan
- ☐ ruokahaluni on huonompi kuin ennen
- ☐ ruokahaluni on paljon huonompi kuin ennen
- ☐ minulla ei ole enää lainkaan ruokahalua

36. Tuntuuko Sinusta, että tarvitset apua masentuneen tai ahdistuneen mielialan takia?

☐ kyllä ☐ en osaa sanoa ☐ ei

37. Oletko joskus yrittänyt saada apua masentuneeseen tai ahdistuneeseen oloon puhumalla siitä? Vastaa joka kohtaan.

	Kyllä	En
Ystävillesi, muille nuorille	☐	☐
Vanhemmillesi	☐	☐
Muille aikuisille, sukulaisille tai ystäville	☐	☐

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STAKES **Kouluterveyskysely** | Erikoistutkija Minna Pietikäinen | 6/12

38. Oletko joskus hakenut apua joltakin ammattiauttajalta masentuneen tai ahdistuneen mielialan takia? Vastaa joka kohtaan.

	Kyllä	En
Lääkäriltä	☐	☐
Terveydenhoitajalta	☐	☐
Psykologilta	☐	☐
Koulukuraattorilta	☐	☐
Muulta terveydenhuollon ammattilaiselta	☐	☐
Opettajalta	☐	☐
Muun alan ammattiauttajalta	☐	☐

39. Jos olet käynyt lääkärin tai muun terveydenhoitohenkilön vastaanotolla masentuneen tai ahdistuneen mielialan takia, kuinka monta kertaa yhteensä?

☐ kerran
☐ kahdesti
☐ useita kertoja
☐ en ole käynyt vastaanotolla näistä syistä

TERVEYSOPETUS

40. Oletko osallistunut tämän LUKUVUODEN aikana terveystiedon oppitunneille?

☐ kyllä ☐ en

41. Lue seuraavat terveystiedon opetusta koskevat väittämät huolellisesti. Merkitse se vaihtoehto, joka parhaiten kuvaa mielipidettäsi. Vastaa joka kohtaan.

	Täysin samaa mieltä	Samaa mieltä	Eri mieltä	Täysin eri mieltä
Terveystiedon opetuksen aiheet kiinnostavat minua	☐	☐	☐	☐
Olen oppinut terveystiedon oppitunneilla hyödyllisiä asioita terveydestä	☐	☐	☐	☐
Terveystiedon tunneilla käsitellyt asiat ovat vaikeita	☐	☐	☐	☐
Terveystiedon opetus saa minut pohtimaan omaa terveyttäni	☐	☐	☐	☐
Terveystiedon opetus on lisännyt taitojani ja valmiuksiani huolehtia terveydestäni	☐	☐	☐	☐
Olen oppinut terveystiedon opetuksen myötä pohtimaan terveyden merkitystä laajemmin yhteiskunnassa	☐	☐	☐	☐

42. Mitä mieltä olet terveystieto-oppiaineesta?

☐ se on yksi mieluisimmista oppiaineista
☐ ei mieluinen eikä epämieluisa - keskiverto
☐ se on yksi epämieluisimmista oppiaineista

43. Seuraavat väittämät käsittelevät päihteisiin liittyviä tietojasi ja käsityksiäsi. Vastaa joka kohtaan.

	Oikein	Väärin	En tiedä
Tupakointi aiheuttaa luuston haurastumista	☐	☐	☐
Niin sanotut kevytsavukkeet ovat terveydelle vähemmän vaarallisia kuin muut savukkeet	☐	☐	☐
Nuuskaaminen parantaa fyysistä suorituskykyä	☐	☐	☐
Nuorten säännöllinen humalaan juominen heikentää muistia ja vaikeuttaa oppimista	☐	☐	☐
Alkoholijuomien hallussapito on kielletty alle 18-vuotiailta	☐	☐	☐
Sama määrä alkoholia nostaa yhtä paljon samanpainoisen naisen ja miehen veren alkoholipitoisuutta	☐	☐	☐

44. Seuraavat väittämät käsittelevät seksuaalisuuteen liittyviä tietojasi ja käsityksiäsi. Vastaa joka kohtaan.

	Oikein	Väärin	En tiedä
Kuukautisten alkaminen on merkki siitä, että tyttö voi tulla raskaaksi	☐	☐	☐
Ehkäisyvälineistä vain kondomi suojaa sukupuolitaudeilta	☐	☐	☐
Sukupuolitauti on joskus täysin oireeton	☐	☐	☐
Nainen ei voi tulla raskaaksi ensimmäisellä yhdyntäkerralla	☐	☐	☐
Siemensyöksyjen alkaminen on merkki siitä, että poika on tullut sukukypsäksi ja voi siittää lapsia	☐	☐	☐
Klamydiatulehdus voi aiheuttaa hedelmättömyyttä	☐	☐	☐
Kerran sairastettua sukupuolitautia ei voi saada uudelleen	☐	☐	☐
Saatuaan HI-viruksen henkilö voi tartuttaa sitä muihin loppuikänsä	☐	☐	☐

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SEKSUAALITERVEYS

Seuraavat kysymykset eivät ehkä ole useimmille teistä ajankohtaisia. Vastausvaihtoehdoissa olevan ohjeen mukaan voit siirtyä niiden kysymysten ohi, jotka eivät koske Sinua.

45. Seurusteletko nykyisin VAKITUISESTI?

☐ kyllä ☐ en

46. Oletko koskaan tehnyt seuraavia asioita? Vastaa joka kohtaan.

	Kyllä	En
Suudellut suulle	☐	☐
Hyväillyt vaatteiden päältä	☐	☐
Hyväillyt vaatteiden alta tai alastomana	☐	☐

47. Oletko ollut sukupuoliyhdynnässä?

☐ en (siirry kysymykseen 51)

☐ kyllä, **kuinka monta kertaa yhteensä?**

- ☐ kerran
- ☐ 2-4 kertaa
- ☐ 5-9 kertaa
- ☐ 10 kertaa tai useammin

48. Kuinka usein olet ollut yhdynnässä viimeksi kuluneen KUUKAUDEN aikana?

- ☐ en kertaakaan
- ☐ kerran
- ☐ 2-3 kertaa
- ☐ neljä kertaa tai useammin

49. Kuinka monen kumppanin kanssa olet ollut sukupuoliyhdynnässä?

- ☐ yhden
- ☐ kahden
- ☐ kolmen tai neljän
- ☐ viiden tai useamman

50. Mitä ehkäisymenetelmää käytitte VIIMEISIMMÄSSÄ yhdynnässä?

- ☐ ei mitään
- ☐ kondomia
- ☐ e-pillereitä
- ☐ kondomia ja e-pillereitä
- ☐ jotain muuta menetelmää

51. Ajattele mahdollista seksuaaliterveyteen liittyvää käyttäytymistäsi tulevaisuudessa. Kuinka helppoa tai vaikeaa sinulle olisi

	Erittäin helppoa	Melko helppoa	Melko vaikeaa	Erittäin vaikeaa
Puhua avoimesti seksistä poika-/tyttöystäväsi kanssa	☐	☐	☐	☐
Hankkia kondomeja	☐	☐	☐	☐
Ehdottaa poika-/tyttöystävälle kondomin käyttöä	☐	☐	☐	☐
Vaatia poika-/tyttöystävältäsi kondomin käyttöä yhdynnässä	☐	☐	☐	☐
Käyttää kondomia oikein	☐	☐	☐	☐
Kieltäytyä sellaisesta seksuaalikäyttäytymisestä, jota et halua	☐	☐	☐	☐
Varata aika lääkärille tai terveydenhoitajalle seksuaaliterveyteen liittyvässä asiassa	☐	☐	☐	☐

Tytöille (pojat siirtyvät kysymykseen 54)

52. Oletko käyttänyt jälkiehkäisyä?

- ☐ en tiedä, mitä jälkiehkäisy on
- ☐ en ole käyttänyt
- ☐ kyllä, **kuinka monta kertaa yhteensä?**
  - ☐ kerran
  - ☐ kaksi kertaa
  - ☐ 3 kertaa tai useammin

53. Käytätkö nykyisin ehkäisypillereitä?

☐ en ☐ kyllä

TUPAKOINTI

54. Miten helppoa ikäistesi on nykyisin ostaa tupakkaa kotisi lähikaupoista, kioskeista, huoltoasemilta tai automaateista?

- ☐ erittäin helppoa
- ☐ melko helppoa
- ☐ melko vaikeaa
- ☐ erittäin vaikeaa

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55. Oletko OSTANUT viimeksi kuluneen KUUKAUDEN aikana tupakkaa?

☐ en (siirry kysymykseen 56)
☐ olen ostanut

Mistä ostit? Vastaa joka kohtaan.

	En	Kyllä
Kaupasta	☐	☐
Kioskista	☐	☐
Huoltoasemalta	☐	☐
Baarista	☐	☐
Automaatista	☐	☐
Kavereilta	☐	☐
Muualta	☐	☐

56. Oletko SAANUT tupakkaa viimeksi kuluneen KUUKAUDEN aikana jollain muulla tavalla?

	En	Kyllä
Isältä tai äidiltä	☐	☐
Muilta aikuisilta	☐	☐
Sisaruksilta	☐	☐
Kavereilta	☐	☐
Otin kotoa	☐	☐

57. Kuinka monta savuketta, piipullista ja sikaria olet polttanut yhteensä tähän mennessä?

☐ en yhtään (siirry kysymykseen 60)
☐ vain yhden (siirry kysymykseen 60)
☐ noin 2-50
☐ yli 50

58. Mikä seuraavista vaihtoehdoista kuvaa parhaiten NYKYISTÄ TUPAKOINTIASI?

☐ tupakoin kerran päivässä tai useammin
☐ tupakoin kerran viikossa tai useammin, en kuitenkaan päivittäin
☐ tupakoin harvemmin kuin kerran viikossa
☐ olen lakossa tai lopettanut tupakoinnin

59. Miten usein tupakoit koulumatkalla tai koulussa? Vastaa joka kohtaan.

	En koskaan	Silloin tällöin	Joka päivä
Koulumatkalla	☐	☐	☐
Koulussa, koulualueella	☐	☐	☐
Koulun läheisyydessä kouluaikana	☐	☐	☐

60. Onko tupakointi sallittua siinä koulussa, jota käyt?

☐ kielletty kokonaan
☐ sallittu tietyissä paikoissa
☐ sallittu rajoituksetta

61. Miten tarkkaan oppilaiden tupakointirajoituksia valvotaan koulussasi?

☐ erittäin tarkasti
☐ melko tarkasti
☐ ei juuri lainkaan

62. Tupakoivatko opettajat tai muu henkilökunta koulurakennuksessa tai koulun alueella?

☐ kyllä, päivittäin
☐ kyllä, joskus
☐ eivät tupakoi
☐ en osaa sanoa

63. Ovatko vanhempasi tupakoineet Sinun elinaikanasi?

	Äiti	Isä
Ei ole koskaan tupakoinut	☐	☐
On tupakoinut, mutta lopettanut	☐	☐
Tupakoi nykyisin	☐	☐
En osaa sanoa	☐	☐

64. Oletko koskaan kokeillut nuuskaamista? Montako kertaa yhteensä tähän mennessä?

☐ en ole kokeillut
☐ olen kokeillut kerran
☐ olen nuuskannut 2-50 kertaa
☐ olen nuuskannut yli 50 kertaa

65. Nuuskaatko nykyisin?

☐ en lainkaan
☐ silloin tällöin
☐ päivittäin

MUUT PÄIHTEET

66. Miten helppoa ikäistesi on nykyisin ostaa KESKIOLUTTA TAI SIIDERIÄ kotisi lähikaupoista, kioskeista tai huoltoasemilta?

☐ erittäin helppoa
☐ melko helppoa
☐ melko vaikeaa
☐ erittäin vaikeaa

67. Kuinka usein kaiken kaikkiaan käytät alkoholia, esimerkiksi puoli pulloa keskiolutta tai enemmän?

- ☐ kerran viikossa tai useammin
- ☐ pari kertaa kuukaudessa
- ☐ noin kerran kuukaudessa
- ☐ harvemmin
- ☐ en käytä alkoholijuomia (siirry kysymykseen 70)

68. Kuinka usein käytät alkoholia TOSI HUMALAAN asti?

- ☐ kerran viikossa tai useammin
- ☐ noin 1-2 kertaa kuukaudessa
- ☐ harvemmin
- ☐ en koskaan

69. Miten hankit viime käyttökerralla nauttimasi alkoholijuomat? Vastaa joka kohtaan.

	Kyllä	Ei
Hain itse Alkosta	☐	☐
Hain itse kaupasta	☐	☐
Isä tai äiti haki tai tarjosi	☐	☐
Vanhemmat sisarukset hakivat tai tarjosivat	☐	☐
Otin kotoa	☐	☐
Kaverit hakivat tai tarjosivat	☐	☐
Joku tuntematon henkilö haki tai tarjosi	☐	☐
Ulkomailta tai laivalta	☐	☐

70. Tiedätkö tuttaviesi joukossa jonkun, joka viimeksi kuluneen VUODEN aikana olisi kokeillut huumaavia aineita (hasista, tinneriä tai muuta nuuhkittavaa, lääkkeitä, joista saa humalan, tai muita vastaavia aineita)?

- ☐ en tiedä ketään nuorta
- ☐ tiedän yhden nuoren
- ☐ tiedän 2-5 nuorta
- ☐ tiedän useampia kuin 5 nuorta

71. Onko Sinulle viimeksi kuluneen VUODEN aikana tarjottu huumaavia aineita SUOMESSA?

- ☐ ei
- ☐ kyllä, **kuka tarjosi?**
  - ☐ ystävät tai tuttavat
  - ☐ tuntemattomat henkilöt

72. Oletko koskaan kokeillut tai käyttänyt seuraavia aineita? Vastaa joka kohtaan.

	En koskaan	Kerran	2-4 kertaa	5 kertaa tai useammin
Marihuanaa tai hasista	☐	☐	☐	☐
Haistellut jotain huumaavaa ainetta (tinneriä, liimaa tms.) päihtyäksesi	☐	☐	☐	☐
Alkoholia ja lääkkeitä yhdessä	☐	☐	☐	☐
Lääkkeitä (rauhoittavia, uni- tai särkylääkkeitä, ilman alkoholia) päihtyäksesi	☐	☐	☐	☐
Ekstaasia	☐	☐	☐	☐
Subutexia	☐	☐	☐	☐
Heroiinia, kokaiinia, amfetamiinia, LSD:tä tai muita vastaavia huumeita	☐	☐	☐	☐

73. Muistele viimeksi kuluneita 30 PÄIVÄÄ. Kuinka monta kertaa olet tuona aikana käyttänyt HUUMAAVIA AINEITA (esim. tinneriä, liimaa, lääkkeitä, alkoholia ja lääkkeitä yhdessä, hasista, ekstaasia, subutexia, heroiinia, kokaiinia, amfetamiinia, LSD:tä)?

- ☐ en lainkaan
- ☐ kerran
- ☐ 2-4 kertaa
- ☐ viisi kertaa tai useammin

74. Millaisiksi arvioit IKÄTOVERIESI mahdollisuudet hankkia huumeita, esimerkiksi marihuanaa tai hasista, OMALLA paikkakunnallasi?

- ☐ erittäin helppoa
- ☐ melko helppoa
- ☐ melko vaikeaa
- ☐ erittäin vaikeaa

75. Mitä mieltä olet seuraavasta väitteestä? "Marihuanan ja hasiksen kokeileminen ei ole sen vaarallisempaa kuin muutaman olutpullon juominen."

- ☐ täysin samaa mieltä
- ☐ samaa mieltä
- ☐ eri mieltä
- ☐ täysin eri mieltä

76. Ihmisillä on erilaisia käsityksiä siitä, mikä on hyväksyttävää ja mikä ei. Hyväksytkö Sinä seuraavat asiat? Vastaa joka kohtaan.

	Kyllä	En	En osaa sanoa
Tupakointi silloin tällöin	☐	☐	☐
10 tai useamman savukkeen poltto päivässä	☐	☐	☐
Parin alkoholiannoksen juominen muutaman kerran viikossa	☐	☐	☐
Humala kerran viikossa	☐	☐	☐
Marihuanan polttaminen silloin tällöin	☐	☐	☐
Marihuanan polttaminen säännöllisesti	☐	☐	☐

MUUT TERVEYSTOTTUMUKSET

77. Kuinka usein harrastat urheilua tai liikuntaa vapaa-aikanasi vähintään PUOLEN TUNNIN ajan?

- ☐ useita kertoja päivässä
- ☐ noin kerran päivässä
- ☐ 4-6 kertaa viikossa
- ☐ 2-3 kertaa viikossa
- ☐ kerran viikossa
- ☐ harvemmin
- ☐ en lainkaan

78. Koulutuntien ulkopuolella: Kuinka monta tuntia VIIKOSSA tavallisesti harrastat liikuntaa niin, että HENGÄSTYT ja HIKOILET?

- ☐ en yhtään
- ☐ noin ½ tuntia
- ☐ noin 1 tunnin
- ☐ noin 2-3 tuntia
- ☐ noin 4-6 tuntia
- ☐ noin 7 tuntia tai enemmän

79. Kuinka usein syöt aamupalaa (muutakin kuin vain kahvia, mehua tai muita juomia) kouluviikon aikana?

- ☐ viitenä aamuna
- ☐ 3-4 aamuna
- ☐ 1-2 aamuna
- ☐ harvemmin

80. Mikä seuraavista vaihtoehdoista parhaiten kuvaa perheesi ateriointia iltapäivällä tai illalla?

- ☐ ei varsinaista ateriaa, vaan jokainen ottaa itselleen syötävää
- ☐ valmistetaan ateria, mutta koko perhe ei syö yhtä aikaa
- ☐ syömme yhteisen aterian, jolloin yleensä kaikki ovat ruokapöydässä

81. Millainen koulusi ruokailutilanne on yleensä? Vastaa joka kohtaan.

	Kyllä	Ei
Ruokasalissa on rauhallista	☐	☐
Ruokajono kulkee nopeasti	☐	☐
Aikuisia syö kanssamme ruokasalissa	☐	☐
Pöytätoverini käyttäytyvät hyvin	☐	☐

82. Mikä seuraavista vaihtoehdoista parhaiten kuvaa kouluruokailuasi?

- ☐ syön yleensä tarjotun ruoan
- ☐ syön yleensä leivän, juoman ja/tai salaatin, mutta harvoin pääruokaa
- ☐ en yleensä syö kouluruokaa (siirry kysymykseen 84)

83. Mitä aterianosia yleensä syöt kouluruoalla?

	Kyllä	Ei
pääruokaa	☐	☐
salaattia	☐	☐
maitoa tai piimää	☐	☐
leipää	☐	☐

84. Mitä MUUTA kuin kouluruokalassa tarjottua ruokaa syöt yleensä koulussa kouluviikon aikana?

- ☐ en syö muuta (siirry kysymykseen 86)
- ☐ syön muuta, **mitä? Vastaa joka kohtaan.**

	Harvemmin kuin kerran viikossa	1-2 kertaa viikossa	3-5 kertaa viikossa
Hedelmiä/hedelmäsoseita	☐	☐	☐
Leipää	☐	☐	☐
Makeaa kahvileipää	☐	☐	☐
Lihapiirakkaa, hampurilaista tms.	☐	☐	☐
Makeisia	☐	☐	☐
Jäätelöä	☐	☐	☐
Sokeroitua virvoitusjuomaa	☐	☐	☐
Vähäkalorista virvoitusjuomaa	☐	☐	☐
Jotain muuta	☐	☐	☐

85. Jos syöt koulussa välipaloja, niin mistä hankit ne? Vastaa joka kohtaan.

	Kyllä	Ei
Koulun välipalatarjoilusta	☐	☐
Koulussa olevista automaateista	☐	☐
Kaupasta, kioskista tai huolto-asemalta	☐	☐
Tuon välipalat kotoa	☐	☐

86. Kuinka usein olet juonut tai syönyt seuraavia viimeksi kuluneen VIIKON (7 pv) aikana? Vastaa joka kohtaan.

	En kertaakaan	1-2 päivänä	3-5 päivänä	6-7 päivänä
Sokeroituja virvoitusjuomia	☐	☐	☐	☐
Vähäkalorisia virvoitusjuomia	☐	☐	☐	☐
Makeisia	☐	☐	☐	☐
Suklaata	☐	☐	☐	☐
Tuoreita vihanneksia, salaattia	☐	☐	☐	☐
Hedelmiä, marjoja	☐	☐	☐	☐
Ranskanperunoita	☐	☐	☐	☐
Perunalastuja tms.	☐	☐	☐	☐
Hampurilaisia, hot dogeja tms.	☐	☐	☐	☐
Makeaa kahvileipää	☐	☐	☐	☐
Pizzaa	☐	☐	☐	☐
Lihapiirakoita, lihapasteijoita	☐	☐	☐	☐
Jäätelöä	☐	☐	☐	☐

87. Mitä mieltä olet painostasi? Oletko mielestäsi

- ☐ selvästi ylipainoinen
- ☐ hieman ylipainoinen
- ☐ sopivan painoinen
- ☐ hieman tai selvästi alipainoinen

88. Mihin aikaan tavallisesti menet nukkumaan koulupäivinä?

- ☐ noin 21.00 tai aikaisemmin
- ☐ noin 21.30
- ☐ noin 22
- ☐ noin 22.30
- ☐ noin 23
- ☐ noin 23.30
- ☐ noin 24
- ☐ noin 24.30
- ☐ noin 01
- ☐ noin 01.30 tai myöhemmin

89. Kuinka usein harjaat hampaasi?

- ☐ en koskaan
- ☐ noin kerran viikossa tai harvemmin
- ☐ noin 2-3 kertaa viikossa
- ☐ noin 4-5 kertaa viikossa
- ☐ noin kerran päivässä
- ☐ useampia kertoja päivässä

KOULUTAPATURMAT

90. Onko Sinulle tämän LUKUVUODEN aikana sattunut koulussa tai koulumatkalla tapaturma, joka on edellyttänyt lääkärin tai terveydenhoitajan vastaanotolla käyntiä?

	Ei kertaakaan	Kerran	Kaksi kertaa tai useammin
Välitunnilla	☐	☐	☐
Liikuntatunnilla	☐	☐	☐
Tekstiili- tai teknisen työn tunnilla	☐	☐	☐
Muulla tunnilla	☐	☐	☐
Koulumatkalla	☐	☐	☐

RIKKEET JA RIKOKSET

91. Oletko viimeksi kuluneen 12 KUUKAUDEN aikana tehnyt seuraavia asioita? Vastaa joka kohtaan.

	En ole	Kerran	2-4 kertaa	Yli 4 kertaa
Kirjoittanut tai maalannut kirjoituksia tai graffiteja seiniin, busseihin, pysäkkikatoksiin, ikkunoihin tai muihin vastaaviin paikkoihin	☐	☐	☐	☐
Tahallasi vahingoittanut tai tuhonnut koulun omaisuutta tai koulurakennusta	☐	☐	☐	☐
Tahallisesti vahingoittanut tai tuhonnut muuta kuin koululle kuuluvaa omaisuutta	☐	☐	☐	☐
Varastanut jotakin kaupasta tai kioskista	☐	☐	☐	☐
Osallistunut tappeluun	☐	☐	☐	☐
Hakannut jonkun	☐	☐	☐	☐

92. Onko Sinulle viimeksi kuluneen 12 KUUKAUDEN aikana tehty seuraavia asioita? Vastaa joka kohtaan.

	Kyllä	Ei
Varastettu tai yritetty varastaa jotain käyttämällä väkivaltaa tai uhkaamalla sillä	☐	☐
Muuten varastettu jotain	☐	☐
Uhattu vahingoittaa ruumiillisesti	☐	☐
Käyty ruumiillisesti kimppuusi kuten lyöty, potkittu tai käytetty jotain asetta	☐	☐

RAHAPELIT

93. Kuinka usein pelaat rahapelejä?

- ☐ päivittäin tai lähes päivittäin
- ☐ 1-3 kertaa viikossa
- ☐ 2-3 kertaa kuukaudessa
- ☐ kerran kuukaudessa tai harvemmin
- ☐ en ole pelannut viimeisen vuoden aikana

KOTI JA YSTÄVÄT

94. Onko Sinulla tällä hetkellä todella läheistä ystävää, jonka kanssa voit keskustella luottamuksellisesti lähes kaikista omista asioistasi?

- ☐ ei ole läheisiä ystäviä
- ☐ on yksi läheinen ystävä
- ☐ on kaksi läheistä ystävää
- ☐ on useampia läheisiä ystäviä

95. Tuntevatko vanhempasi useimmat ystäväsi?

- ☐ molemmat tuntevat
- ☐ vain isä tuntee
- ☐ vain äiti tuntee
- ☐ ei kumpikaan tunne

96. Tietävätkö vanhempasi, missä vietät perjantai- ja lauantai-iltasi?

- ☐ tietävät aina
- ☐ tietävät joskus
- ☐ useimmiten eivät tiedä

97. Pystytkö keskustelemaan vanhempiesi kanssa omista asioistasi?

- ☐ en juuri koskaan
- ☐ silloin tällöin
- ☐ melko usein
- ☐ usein

98. Oletko viimeksi kuluneen 12 KUUKAUDEN aikana saanut vanhemmiltasi seuraavia rangaistuksia? Vastaa joka kohtaan.

	Kyllä	Ei
Suullinen nuhtelu	☐	☐
Viikko- tai muun rahan antamatta jättäminen	☐	☐
Kotiaresti	☐	☐
Ruumiillinen kuritus	☐	☐

99. Ovatko vanhempasi olleet viimeksi kuluneen VUODEN aikana työttöminä tai pakkolomalla?

- ☐ ei kumpikaan
- ☐ toinen vanhemmistani
- ☐ molemmat vanhempani

100. Kuuluuko perheeseesi?

- ☐ äiti ja isä
- ☐ äiti ja isäpuoli
- ☐ isä ja äitipuoli
- ☐ vain äiti
- ☐ vain isä
- ☐ avo-/aviomies tai -vaimo
- ☐ joku muu huoltaja

101. Mikä on korkein koulutus, minkä vanhempasi on suorittanut?

	Äiti	Isä
Kansakoulu/kansalaiskoulu tai peruskoulu	☐	☐
Peruskoulu ja ammatillinen koulutus	☐	☐
Lukio tai lukio ja ammatillinen koulutus	☐	☐
Yliopisto- tai korkeakoulututkinto	☐	☐

102. Kuinka paljon Sinulla on rahaa käytettävissäsi keskimäärin VIIKOSSA (viikkorahaa tai muita tuloja, jotka saat käyttää niin kuin haluat)?

- ☐ alle 3 euroa
- ☐ 3-6 euroa
- ☐ 7-9 euroa
- ☐ 10-17 euroa
- ☐ 18-35 euroa
- ☐ yli 35 euroa

KIITÄMME VASTAUKSISTASI!

Jos kysymykset jäivät askarruttamaan mieltäsi, keskustele niistä vanhempiesi tai muun aikuisen kanssa. Voit myös ottaa yhteyttä opettajaasi, terveydenhoitajaan, koulusi psykologiin tai kuraattoriin.

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Appendix 3. Questions and scoring of response alternatives from School Health Promotion study that suits theoretical framework of new conceptual model of oral health inequalities.

Variable	Response alternatives
School-level socioeconomic position	
1. During the past year, have your parents been unemployed or laid-off?	1: neither of my parents 2: one of my parents 3: both parents
2.Who are the adults you live with? Choose the option that best describes your situation.	1: my mother and my father 2: my mother and my stepfather 3: my father and my stepmother 4: only my mother 5: only my father 6: my husband/my wife 7: other carer
3. What is the highest educational level your mother has achieved?	1: University, university of applied sciences or other higher education institution 2:
4. What is the highest educational level your father has achieved?	Occupational studies in addition to upper secondary school or vocational education institution 3: Upper secondary school or vocational education institution 4: Comprehensive school or primary school
5. On average, how much spending money do you have per week (pocket-money or other income you can use at your own discretion)?	1: over 35€ 2: 18-35€ 3: 10-17€ 4: 7-9€ 5: 3-6€ 6: under 3€
Social environment	
Schools attitude towards smoking	
1. Is smoking allowed in your school?	1: Forbidden 2: Allowed in certain areas 3: Allowed without restrictions
2. In your school, how closely are the smoking restrictions concerning pupils monitored?	1: Very closely 2: Fairly closely 3: Hardly at all
3. Do the teachers or other personnel smoke in the school or on school premises?	0: I don't know 1: No 2: Yes, sometimes 3: Yes, daily
Chance to buy alcohol nearby	
1. How easy is it nowadays for people your age to buy beer or cider at convenience stores, mini markets or petrol stations near your home?	1: Very difficult 2: Fairly difficult 3: Fairly easy 4: Very easy
Chance to get drugs nearby	
1. During the past year have you been offered narcotic substances in Finland?	1: No 2: Yes
2. In your opinion, what opportunities does a person your age have to obtain narcotics, such as marijuana or hashish, where you live?	1: Very difficult 2: Fairly difficult 3: Fairly easy 4: Very easy
School health services	
Health services in school	
1. If you have other problems than those related to school work, how easily can you get help for them from school nurse, physician, social worker, psychologist or teacher?	1: Very easy 2: Fairly easy 3: Fairly difficult 4: Very difficult
Access to health services	
1. How well is your school's health services is working when pupils want to discuss their personal subjects with someone (for example sex, depression)? Are you...	1: Very satisfied 2: Fairly satisfied 3: Fairly unsatisfied 4: Very unsatisfied
2. If you wanted to visit your school nurse, physician, social worker or psychologist, how easy would it be to get an appointment?	1: Very easy 2: Fairly easy 3: Fairly difficult 4: Very difficult
School environment	
Stress from school	

1. At the moment, how do you like going to school?	1: Very much 2: Rather much 3: Rather little 4: Not at all
2. Have you had any of the following feelings relating to school work? a) I feel overwhelmed by school work b) It feels that there is no point in studying c) I feel inadequate at my studies *)	1: Hardly ever 2: A few times a month 3: A few days a week 4: Almost daily
Support from teachers and/or school	
1. Select the alternative that best describes your opinion. a) Teachers encourage me to express my opinions in class b) Teachers are interested in how I am doing c) My teachers expect too much from me at school d) Teachers treat us fairly	1: Fully agree 2: Agree 3: Disagree 4: Fully disagree
2. If you have difficulties at school or with your school work, how often do you get help at school?	1: Whenever I need 2: On most occasions 3: Rarely 4: Hardly ever
Peaceful school environment	
1. Select the alternative that best describes your opinion: The classroom discipline in my class is good	1: Fully agree 2: Agree 3: Disagree 4: Fully disagree
2. In your school, do the following conditions disturb your school work? a) Restless working environment b) Hurry	1: Not at all 2: Rather little 3: Rather much 4: Very much
Physical hazards in school	
1. In your school, do the following conditions disturb your school work? a) Crowded teaching spaces b) Noise, echoes c) Inappropriate lighting d) Insufficient ventilation or bad indoor air e) Temperature (hot, cold, draft) f) Dirt, dust g) Uncomfortable chairs or desks h) Inadequate facilities (toilets, changing rooms, showers) i) Restless working environment j) Risk of accident	1: Not at all 2: Rather little 3: Rather much 4: Very much
Eating circumstances at school	
1. What is the mealtime environment at your school like, in general? a) The mealtime environment is pleasant b) The mealtime environment is noise-free c) The queue moves fast d) There are adults eating with us in the lunch room	1: Yes 2: No
Home environment	
Parental support	
1. If you have difficulties at school or with your school work, how often do you get help at home?	1: Whenever I need 2: On most occasions 3: Rarely 4: Hardly ever
2. Which of the following alternatives best describes your family's eating habits in the afternoon or evening?	1: We enjoy a meal together and usually everyone is at the table 2: We have a proper meal, but we do not all eat at the same time 3: We do not have a proper meal, everyone grabs something to eat
3. Do your parents know most of your friends?	1: They both do 2: Only my father does 3: Only my mother does 4: Neither does
4. Do your parents know where you spend your Friday and Saturday nights?	1: Yes, always 3: Yes, sometimes 3: Most of the time they don't know
5. Can you talk about things that concern you with your parents?	1: Often 2: Fairly often 3: Every once and a while 4: Hardly ever
Family smoking	
1. Where did you get cigarettes during the past month? a) Parents b) Siblings c) Took them from home	1: No 2: Yes
2. During your life, have your a) mother b) father smoked?	1: Never smoked 2: Used to but has quit now 3: Smokes nowadays 4: I don't know
Tooth brushing	
1. How often do you brush your teeth?	1: At least twice a day 2: Once a day 3: 4-5 times per week 4: 2-3 times per week 5: Once a week or less often 6: Never
Eating school meal	

1. Which of the following alternatives best describes your school lunch eating?	1: Most often I eat the hot school lunch offered by school 2: Most often I eat the bread, drink and/or salad offered offered by school 3: Most often I don't eat school lunch offered by school
Eating unhealthy snacks during school day	
1. What do you eat or drink at school apart from school meals served in the lunchroom? a) cookies b) meat pies or hamburgers c) sweets d) ice cream e) sugar-sweetened beverages f) low-calorie beverages	0: No 1: Yes
Eating unhealthy snacks overall	
1. During the past week (7 days), how often have you eaten or drunk the following? a) sugar-sweetened beverages b) low-calorie beverages c) sweets d) chocolate e) chips f) crisps g) hamburgers or hot dogs h) cookies i) pizza j) meat pies k) ice cream	1: Not once 2: in 1-2 days 3: in 3-5 days 4: in 6-7 days

*) If there were multiple items (a, b, c,...k) within questions total means for the questions were calculated from item-wise means.

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