Tampere University

ANU LINNANSAARI

Implementing Preventive Tobacco Policies

The role of contextual factors in policy implementation
at school and national levels

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ACADEMIC DISSERTATION
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I wanted to pursue doctoral studies in health sciences, because public health as a multidisciplinary field enabled me to combine my many areas of interest and subject teacher background in a comprehensive and societally significant way. I was drawn to research, because it was connected to the way I look at life and the world at large, and it allowed me to develop in many of the areas that I find important, such as the art of thinking and argumentation. I am immensely happy and grateful to have been able to complete this journey. The process of writing my doctoral thesis has brought with it diverse experiences, versatile skills and introduced me to wonderful new people. It has also taught me to appreciate venturing out of my comfort zone, because it is precisely there that I have had my greatest epiphanies. The journey has also included many hurdles that have forced me to re-examine my own choices, values and motives. Despite the challenges, I am delighted to have been able to rediscover my passion for research time and time again. This passion has had intrinsic value for me, but it has also served as a tool in completing my degree. For me personally, being a doctor represents the ability to engage in comprehensive, analytical and critical thinking and being humble in terms of the finite nature of my own understanding. Going forward, I hope that my doctoral degree will help me access versatile assignments and positions where I can make a difference in society.

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KIITOKSET

Hakeuduin terveystieteiden tohtoriopintoihin, koska kansanterveystiede monitieteisenä tieteenalana mahdollisti monien mielenkiinnon kohteideni ja aineenopettajataustani yhdistämisen laaja-alaisella ja yhteiskunnallisesti merkittävällä tavalla. Tutkimus veti minua puoleensa, koska se kytkeytyi tapaani tarkastella elämää ja maailmaa laajemminkin ja antoi minulle mahdollisuuden kehittyä monissa tärkeiksi kokemissani asioissa, kuten ajattelu- ja argumentointitaidoissa. Tunnen suurta iloa ja kiitollisuutta siitä, että olen saanut kulkea tämän matkan. Väitöskirjaprosessi on tuonut mukanaan monipuolisia kokemuksia, osaamista ja hienoja tuttavuuksia. Se on myös opettanut arvostamaan epämukavuusalueella olemista, sillä juuri siellä ovat tapahtuneet suurimmat oivallukset. Matkan varrelle on mahtunut myös lukuisia vastoinkäymisiä, jotka ovat pakottaneet tarkistamaan omia valintojani, arvojani ja motiivejani. Vastoinkäymisistä huolimatta olen ilokseni kerta toisensa jälkeen löytänyt palon tutkimuksen tekemiseen. Tämä palo on ollut minulle sekä itseisarvo että välinearvo kohti tohtoriutta. Henkilökohtaisesti tohtorius merkitsee minulle kykyä laaja-alaiseen, analyyttiseen ja kriittiseen ajatteluun sekä nöyryyttä ymmärrykseni rajallisuuden edessä. Toivon, että tohtorin tutkinto avaa minulle mahdollisuuksia monipuolisiin työtehtäviin ja yhteiskunnallisen vaikuttamisen paikkoihin.

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ABSTRACT

Healthy public policies play a crucial role in the health and well-being of populations, as they help to build health-promoting environments. However, the impact of these policies depends on their implementation. For example, global tobacco prevention policies can decrease adolescent tobacco and nicotine use only if they are implemented into national regulations and enforced in the everyday practices of organisations such as schools. Schools are one of the core settings for tobacco prevention and health promotion, as they reach almost all young people. Although preventive tobacco policies are critical for ending the tobacco epidemic, which continues to burden public health, countries vary considerably in how comprehensively the policies are implemented at the national level or enforced in schools. Despite the need for more comprehensive and consistent tobacco policy implementation, so far tobacco research has paid little attention to implementation.

In this doctoral thesis I explain the school- and national-level implementation of preventive tobacco policies. In line with the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) I focus on policies such as smoke-free environments, price and tax measures, product regulations, packaging and labelling, bans on advertising and promotion, and age limits. The thesis consists of four international journal articles and a summary article. I used a cross-country research design and qualitative methods with critical realism as an ontological basis. First, I conducted a realist review to explain school staff members' enforcement of school tobacco policies (STPs) (Article I). This understanding was complemented by a thematic analysis of interviews with school staff (n=84) from seven European countries (Articles II and III). In the fourth article, I used a narrative review to assess and compare the comprehensiveness of tobacco policies in the Nordic countries and the reasons for their implementation (Article IV). In the summary article, I synthesised the findings into a programme theory that explains how context interact with policies and influence their implementation via specific mechanisms. The analysis was guided by a multidisciplinary conceptual framework on policy implementation, which helped to explain among other things the role of contextual factors in complex policy implementation processes.

The school-level results showed that three mechanisms – responsibility, motivation and confidence – explained school staff's enforcement of STPs. The emergence of these mechanisms was influenced by certain contextual factors, with consistency of staff enforcement behaviour being one of the key factors. However, consistent staff enforcement was challenged by two key issues. First, some staff did not intervene in rule violations because they were not confident in their own ability to cope with students' negative responses. Staff confidence was supported by certain contextual factors. Intervening in rule violations was easier when staff felt legitimised in their actions, believed they could interact constructively with students, and expected collegial support in the face of challenges. The second issue that challenged consistency was enforcement with vulnerable students who persistently violated smoking bans. The results demonstrated that staff did not intervene in rule violations if they felt that STP enforcement conflicted with support for students' school performance, if they expected stricter disciplinary measures to be ineffective and cause more serious problems, or

if they did not feel supported by other stakeholders involved in the young people's smoking behaviour, such as parents.

The Nordic comparison showed that countries' tobacco policies were harmonised by the WHO FCTC and European Union (EU) directives on tobacco products, taxation and advertising. These measures ensure that core policies, such as indoor smoking bans and the 18-year age limit on sales, are included in national legislation. However, the WHO FCTC and EU directives also explained shared deficiencies across the countries, which were especially visible in the inconsistent or absent regulation of smokeless and novel tobacco and nicotine products. The main reasons for the comprehensive implementation of tobacco policies were national tobacco control actors, such as health ministries and civil society and their networks. These actors also facilitated the Nordic countries to implement some advanced tobacco policies, and indeed to be among the first countries in the world to do so. These advanced policies included, for instance, flavour bans on e-cigarettes in Finland and comprehensive outdoor smoking bans in Sweden.

The programme theory that synthesises the results from the four articles outline how the context interact with policies and influence national- and school-level implementation via specific mechanisms. These causal pathways help us to understand how to support policy implementation by strengthening contextual factors. The recommendations highlight the importance of strengthening collaboration between actors, both within and between implementation levels, and both nationally and internationally. Strengthening collaboration may help to address current implementation challenges, contribute to the implementation of more comprehensive tobacco policies, and support the identification of ways in which different implementation levels can best support each other to achieve the common goals: reducing adolescents' use of tobacco and nicotine products and ending the tobacco epidemic.

TIIVISTELMÄ

Terveyden edistämiseen tähtäävät poliittiset toimet, kuten lait ja säädökset, ovat keskeisiä väestön terveydelle ja hyvinvoinnille, sillä ne auttavat rakentamaan terveyttä tukevia ympäristöjä. Poliittisten toimien vaikutukset riippuvat kuitenkin siitä, miten ne on toimeenpantu. Esimerkiksi globaalit tupakkapoliittiset toimet voivat vähentää nuorten tupakka- ja nikotiinituotteiden käyttöä vain, jos ne sisällytetään kansalliseen lainsäädäntöön ja sääntelyyn ja jos niitä toteutetaan osana organisaatioiden, kuten koulujen, arkea. Koulut ovat yksi keskeisistä terveyden edistämisen ja tupakkatuotteiden käytön ehkäisyn ympäristöistä, koska ne tavoittavat lähes kaikki nuoret. Vaikka ennaltaehkäisevät tupakkapoliittiset toimet ovat ratkaisevan tärkeitä kansanterveyttä edelleen rasittavan tupakkaepidemian lopettamiseksi, maiden välillä ja maiden sisällä koulujen välillä on huomattavia eroja siinä, miten kattavasti nämä toimet on implementoitu ja miten johdonmukaisesti niitä toteutetaan. Huolimatta tupakkapoliittisten toimien kattavamman ja johdonmukaisemman toimeenpanon tarpeesta tupakkatutkimus ei ole toistaiseksi juurikaan keskittynyt toimeenpanon tutkimiseen.

Tämän väitöstutkimuksen tavoitteena oli selittää ennaltaehkäisevien tupakkapoliittisten toimien implementointia kouluissa ja kansallisella tasolla. Tutkimus keskittyi seuraaviin Maailman terveysjärjestön tupakoinnin torjuntaa koskevan puitesopimuksen (WHO FCTC) mukaisiin toimiin: savuttomat ympäristöt, verotus, tuotesääntely, pakkausmerkinnät, mainonta- ja markkinointikiellot sekä ikärajat. Väitöskirja koostuu neljästä kansainvälisestä artikkelista ja yhteenvedosta. Tutkimuksessa hyödynnettiin monikansallista tutkimusasetelmaa ja laadullisia tutkimusmenetelmiä, joiden tieteenfilosofisena lähtökohtana on kriittinen realismi. Ensimmäinen artikkeli oli realistinen katsaus, joka selitti koulun henkilökunnan tupakointikieltojen toteuttamista (artikkeli I). Katsauksen tuottamaa ymmärrystä täydennettiin analysoimalla kouluhenkilökunnan haastatteluja (n=84) seitsemästä Euroopan maasta temaattisen analyysin avulla (artikkelit II ja III). Neljännessä artikkelissa arvioitiin ja vertailtiin narratiivisen katsauksen avulla pohjoismaisen tupakkalainsäädännön ja sääntelyn kattavuutta ja sen toimeenpanoon vaikuttavia syitä (artikkeli IV). Yhteenvetoartikkelissa tulokset koostettiin ohjelmateoriaksi, joka selittää miten konteksti on vuorovaikutuksessa poliittisten toimien kanssa ja vaikuttaa niiden toimeenpanoon tiettyjen mekanismien kautta. Analyysia ohjasi monitieteinen käsitteellinen viitekehys toimeenpanosta. Se auttoi selittämään muun muassa kontekstitekijöiden roolia osana kompleksisia toimeenpanoprosesseja.

Koulun henkilökunnan tupakointikieltojen toteuttamista selitti kolme mekanismia: velvollisuudentunto, motivaatio ja itseluottamus. Erilaiset kontekstitekijät vaikuttivat näiden mekanismien aktivoitumiseen, ja niistä yksi keskeisimmistä oli henkilökunnan toiminnan yhdenmukaisuus kieltojen toteuttamisessa. Toiminnan yhdenmukaisuutta haastoi kuitenkin kaksi asiaa. Ensinnäkin osa henkilökunnasta jätti puuttumatta sääntörikkeisiin, koska he eivät luottaneet selviytyvänsä oppilaiden kielteisten reaktioiden kanssa. Henkilökunnan itseluottamusta tukivat kuitenkin tietyt kontekstitekijät. Sääntörikkeisiin puuttuminen oli helpompaa silloin, kun henkilökunta koki oman toimintansa olevan legitimoitua, uskoi pystyvänsä rakentavaan vuorovaikutukseen opiskelijan kanssa ja luotti saavansa kollegiaalista tukea mahdollisiin haasteisiin. Toinen henkilökunnan yhdenmukaista toimintaa haastavista

tekijöistä oli haavoittuvassa asemassa olevat opiskelijat, jotka toistuvasti rikkoivat tupakointikieltoja. Tulokset osoittivat, että henkilökunnan jäsenet eivät puuttuneet näiden opiskelijoiden sääntörikkeisiin, kun he kokivat kieltojen toteuttamisen olevan ristiriidassa opiskelijoiden koulumenestyksen tukemisen kanssa, kun he odottivat tiukempien kurinpitokeinojen olevan tehottomia ja aiheuttavan vakavampia ongelmia tai kun he eivät kokeneet saavansa tukea nuorten tupakointiin keskeisesti vaikuttavilta sidosryhmiltä, kuten vanhemmilta.

Pohjoismaiden vertailu osoitti, että WHO FCTC sekä tupakkatuotteita, verotusta ja mainontaa koskevat Euroopan unionin (EU) direktiivit ovat yhdenmukaistaneet tupakkapoliittisten toimien implementointia eri maissa. Niillä on varmistettu, että keskeiset ehkäisevät toimet, kuten sisätilojen tupakointikiellot ja 18 vuoden ostoikäraja, on sisällytetty kansalliseen lainsäädäntöön. WHO FCTC ja EU-direktiivit selittivät kuitenkin myös eri maiden yhteisiä lainsäädännöllisiä heikkouksia, jotka näkyivät erityisesti savuttomien ja uusien tupakka- ja nikotiinituotteiden vaihtelevassa ja puutteellisessa sääntelyssä. Kansalliset tupakkapoliittiset toimijat, kuten terveysministeriö ja kansanterveysjärjestöt, ja näiden välinen yhteistyö olivat keskeisiä syitä kattavaan ennaltaehkäisevien tupakkapoliittisten toimien implementointiin. Nämä toimijat ovat myös mahdollistaneet sen, että useat Pohjoismaat ovat ottaneet käyttöön edistyksellisiä tupakkapoliittisia toimia jopa maailman ensimmäisten maiden joukossa. Tällaisia toimia olivat esimerkiksi sähkösavukkeiden makuainekiellot Suomessa ja kattavat ulkoalueiden tupakointikiellot Ruotsissa.

Neljän artikkelin tulokset yhdistävä ohjelmateoria havainnollistaa, miten kontekstitekijät ovat vuorovaikutuksessa tupakkapoliittisten toimien kanssa ja näin vaikuttavat kansalliseen ja koulutason toimeenpanoon tiettyjen mekanismien kautta. Nämä kausaaliprosessit auttavat ymmärtämään, miten toimeenpanoa voitaisiin tukea kontekstitekijöitä vahvistamalla. Suosituksissa korostuu se, että toimijoiden välisen yhteistyön vahvistaminen on tärkeää eri toimeenpanotasoilla ja niiden välillä niin kansallisesti kuin kansainvälisesti. Yhteistyön vahvistaminen voi auttaa ratkaisemaan nykyisiä toimeenpanohaasteita, edistää kattavampien tupakkapoliittisten toimien implementointia ja tukea sellaisten keinojen löytämistä, joiden avulla eri toimeenpanotasot voisivat parhaalla mahdollisella tavalla tukea toinen toisiaan yhteisten tavoitteiden saavuttamiseksi: nuorten tupakka- ja nikotiinituotteiden käytön vähentämiseksi ja tupakkaepidemian lopettamiseksi.

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ABBREVIATIONS

BCW	behaviour change wheel
CMO	context-mechanism-outcome - configuration
ESPAD	European School Survey Project on Alcohol and Other Drugs
EU	European Union
HiAP	health in all policies
HTP	heated tobacco product
IS	implementation science
NADNIC	Nordic adolescents and the new nicotine market
NGO	non-governmental organisation
PI	policy implementation research
RYO	roll-your-own
SCAS	social complex adaptive systems
SILNE-R	Enhancing the effectiveness of programmes and strategies to prevent smoking by adolescents: A realist evaluation comparing seven European countries
STP	school tobacco policy
TAD	Tobacco Advertising Directive (2003/33/EC)
TAPS	tobacco advertising, promotion and sponsorship
TCS	Tobacco Control Scale
TPD	Tobacco Products Directive (2014/40/EU)
TTD	Tobacco Taxation Directive (2011/64/EU)
WHO	World Health Organization
WHO FCTC	World Health Organization Framework Convention on Tobacco Control

ORIGINAL PUBLICATIONS

I.   Linnansaari, A., Schreuders, M., Kunst, A. E., Rimpelä, A., & Lindfors, P. (2019). Understanding school staff members' enforcement of school tobacco policies to achieve tobacco-free school: A realist review. *Systematic Reviews*, *8*(177). https://doi.org/10.1186/s13643-019-1086-5

II.   Linnansaari, A., Schreuders, M., Kunst, A. E., SILNE-R Group, & Lindfors, P. (2022). Facilitating conditions for staff's confidence to enforce school tobacco policies: Qualitative analysis from seven European cities. *Implementation Science Communications*, *3*(113). https://doi.org/10.1186/s43058-022-00362-7

III. Schreuders, M., Linnansaari, A., Lindfors, P., van den Putte, B., & Kunst, A. E. (2020). Why staff at European schools abstain from enforcing smoke-free policies on persistent violators. *Health Promotion International*, *35*(5), 1106–1115. https://doi.org/10.1093/heapro/daz111

IV.   Linnansaari, A., Ollila, H., Pisinger, C., Scheffels, J., Kinnunen, J. M., & Rimpelä, A. (2022). Towards tobacco-free generation: Implementation of preventive tobacco policies in the Nordic countries. *Scandinavian Journal of Public Health*, *0*(0). https://doi.org/10.1177/14034948221106867

1 INTRODUCTION

Health promotion is an umbrella concept covering a wide range of societal activities that aim to promote health and well-being and to prevent ill health. Health promotion aims to ensure that individuals and communities have opportunities to influence their own health and well-being as part of the everyday environments in which people live, grow, learn and work, and which therefore determine their health. The strategies and means for health promotion were originally outlined in the Ottawa Charter (World Health Organization [WHO], 1986) and have been updated several times since then (e.g., in the Sundsvall Statement of 1991, the Jakarta Declaration of 1997 and the Bangkok Charter of 2005). The key means for health promotion include building healthy public policies, creating health-promoting environments, strengthening community action, developing individual health literacy and reorienting healthcare services towards prevention. Of these means, my thesis focuses on healthy public policies and health-promoting environments in the context of tobacco prevention. Healthy public policies acknowledge that all policymaking has impacts on people's health and well-being, either directly or indirectly. Healthy public policies further assist the building of health-promoting environments that aim to make healthy choices easy for everyone.

Many European countries have succeeded in decreasing youth smoking during the past decades (Reitsma, Flor et al., 2021). In Finland, the significant decrease in youth daily smoking – from 27% in 1989 to 7% in 2019 (Kinnunen et al., 2019) – has been a decades-long process, made possible by mutually reinforcing interactions between tobacco policies, social norms and smoking prevalence (Heloma, 2022; Timberlake et al., 2019). However, the decline in youth smoking has not been consistent across countries (Reitsma, Flor et al., 2021), and clear differences in smoking between different socio-economic groups give rise to concerns about increasing inequalities in health (Hiscock et al., 2012; Moor et al., 2019). The challenge of the tobacco epidemic is exacerbated by novel tobacco and nicotine products that especially appeal to youth. Thus, tobacco is still a major public health threat in Europe in the early 21st century.

To tackle the health burden caused by tobacco, in 2021 Europe's Beating Cancer Plan set the goal of a tobacco-free generation, aiming for a situation where less than 5% of Europe's population would be using tobacco products by 2040 (European Commission, 2021a). Strong tobacco prevention is crucial to achieve this goal. Schools represent a core setting for tobacco prevention (WHO, 1986), as they reach the majority of 15- to 20-year-olds, who are at the highest risk of developing lifelong smoking habits (Reitsma, Flor et al., 2021). Thus, European countries increasingly implement school tobacco policies (STPs) that describe where, when and to whom prohibitions against using tobacco products apply (Mélard et al., 2020). The implementation of smoking bans into school rules, and the enforcement of these policies in everyday practices, is strongly linked to national tobacco control.

A major change in national tobacco control has been witnessed across countries during the last few decades (Cairney et al., 2012). The change was triggered by the first studies reporting significant health effects of smoking in the 1950s. Governments' collaboration with the tobacco industry has since largely been replaced with increasingly restrictive tobacco control such as tax measures, smoking bans in public places, advertising bans, and health warnings on

tobacco packaging. Finland has been at the forefront of tobacco policies since 1976, when the first Tobacco Act was implemented (Finlex, 2016). Finland has also demonstrated progress in tobacco control in recent years – for instance, by responding strongly to the tobacco industry's marketing of novel products. Finland's tobacco endgame goal, which aims for tobacco use by less than 5% of the population by 2030, was broadened in 2016 to cover all non-medicinal nicotine products.

However, although many countries have histories of rather strong tobacco control, there is still considerable inconsistency in how tobacco policies are currently implemented into national legislation and regulations (Joossens et al., 2022) or enforced in schools (Galanti et al., 2014). The inconsistency largely relates to the complexity of policy implementation. Implementation is complex because it involves the participation of multiple interacting actors, and because the circumstances (i.e., context) where policies are implemented are multifaceted and constantly evolving (Pawson, 2013). Therefore, implementation is never linear or entirely controllable, and unpredictable outcomes are likely to emerge.

Although more comprehensive and consistent tobacco policy implementation is needed across countries and schools, tobacco research so far has paid little attention to the study of implementation. In this thesis, I delve into the complexity of policy implementation by analysing the implementation of preventive tobacco policies at schools and national level. I aim to explain how contextual factors interact with the policies and influence their implementation via specific mechanisms. For this purpose, I have applied a cross-country research design and qualitative methods with critical realism as an ontological basis. Understanding these causal pathways in tobacco policy implementation will allow us to support implementation by strengthening the contextual factors.

The knowledge about policy implementation generated in this thesis will participate in 'opening the black box' of success and failure in tobacco control and 'bridging the research-practice gap' towards the tobacco endgame. This understanding will be important for decision makers and stakeholders at both national and school organisational levels, who struggle with whether and how to implement policies in particular settings. Thus, the ultimate objective of this thesis is to contribute to the discussion that aims to support tobacco policies' effectiveness in preventing youth initiation, uptake and exposure to tobacco and nicotine products, and thus to prevent a high burden of tobacco-related diseases and health inequalities in the future.

My thesis consists of four international journal articles and a synthesis. The articles were produced as part of two international research projects: *Enhancing the effectiveness of programmes and strategies to prevent smoking by adolescents: A realist evaluation comparing seven European countries* (SILNE-R), funded by European Union (EU) Horizon 2020, and *Nordic adolescents and the new nicotine market* (NADNIC), funded by the Nordic Cancer Union. In Chapter 2, I provide an overview of the tobacco epidemic and policy implementation and demonstrate current research gaps. In Chapter 3, I present my aims and research questions. In Chapter 4, I explain the conceptual framework for the study of policy implementation, and in Chapter 5, I explain the ontological basis, data and methods of my study. Main findings of the four articles are presented in Chapter 6. This is followed by a discussion (Chapter 7), including a programme theory that synthesises the results and provides recommendations to support policy implementation. It also covers the strengths and limitations of this study. The chapter finishes with the main conclusions and future research suggestions. References are in Chapter 8 and Attachments in Chapter 9. The original articles (I–IV) can be found in Chapter 10.

2 TOBACCO EPIDEMIC AND PREVENTION

2.1 The burden of tobacco on public health

In the early 21st century, tobacco smoking is still a major public health threat, in Europe and globally. It places a burden on public health by increasing the risk of non-communicable diseases, such as respiratory diseases, cardiovascular diseases and major types of cancer (Murray et al., 2020). According to one review assessing the global burden of smoking-related diseases, tobacco-smoking caused around eight million deaths and 200 million disability-adjusted life years globally in 2019 (Reitsma, Kendrick et al., 2021). According to the WHO, around 15% of annual tobacco-related deaths are due to non-smokers being exposed to second-hand smoke (WHO, 2022). The share of all-cause mortality due to smoking is higher in Europe than globally (Janssen et al., 2021; WHO, 2019). A recent study showed that if smoking stopped in the Nordic countries, 430,000 cancer cases could be avoided over 30 years (Andersson et al., 2018). In Europe, smoking is the biggest preventable risk factor for premature death (Mladovsky et al., 2010). Long-term use of tobacco is associated with nicotine dependence, and young people are particularly vulnerable to developing nicotine dependence (DiFranza et al., 2002; Mahajan et al., 2021; Ren & Lotfipour, 2019).

2.1.1 The varying decline in adolescent smoking

In 2019 globally, around 6% of adolescents aged 13–15 years reported smoking cigarettes (WHO, 2021b). Adolescent smoking has decreased in many European countries during the last decades, but the decline has not been consistent across countries (Reitsma, Kendrick et al., 2021). According to the European School Survey Project on Alcohol and Other Drugs (ESPAD), between 1995 and 2019, smoking decreased among European adolescents (15–16-year-olds) in the categories of lifetime/ever use (from 68% to 42%), current use (from 33% to 20%) and daily use (from 20% to 10%) (ESPAD Group, 2020). Among the 11 European countries included in my study (Belgium, Denmark, Finland, Germany, Iceland, Ireland, Italy, the Netherlands, Norway, Portugal and Sweden), all countries except Italy and Denmark managed to decrease youth daily smoking considerably between 1995–2003 and 2019; in 2019, daily youth smoking was the lowest in Iceland (1.9%) and Norway (2.5%), and the highest in Italy (19%) and Denmark (10%). Comparable data for Belgium was not available, but current smoking in 2018 was 13% among boys and 13% among girls (WHO, 2021c). Generally, adolescent smoking is decreasing too slowly to achieve the goal of a tobacco-free generation in Europe by 2040 (Kunst, 2021; Reitsma, Kendrick et al., 2021).

Although smoking has declined in many countries, social inequalities in tobacco use are increasingly being witnessed. Smoking prevalence is higher among groups with lower socio-economic status (Barbeau et al., 2004; Giskes, 2005; Hiscock et al., 2012) – that is, those who are lower in the social hierarchy and thus have limited access to society's resources (Krieger et al., 1997; Smith et al., 2021). Smoking rates in Western Europe, for instance, are two to three

times higher among people with a low education level compared with people with medium- and high-level education (WHO, 2019). These socio-economic differences with regard to smoking are already visible among adolescents (Moor et al., 2019), which raises concerns about increasing health inequalities. Adolescents' socio-economic status is commonly assessed via their academic performance, school track (i.e., academic or vocational) or parents' education (Doku et al., 2010; Moor et al., 2019; Richter et al., 2009).

2.1.2 Smokeless and novel products are causing new challenges

Smokeless tobacco products such as snus, novel tobacco products such as heated tobacco products (HTPs) and novel nicotine products such as electronic cigarettes (e-cigarettes) and nicotine pouches are creating new challenges for tobacco prevention. Compared with other European countries, the use of smokeless tobacco is relatively high in the Nordic countries, particularly among boys. In 2019, boys' use of smokeless tobacco during the previous month was 11% in Finland, 5% in Norway and 3% in Iceland; in 2015, this figure was 15% in Sweden and 11% in Denmark (Raitasalo et al., 2022). In Finland and Norway, adolescent snus use has increased during the last decade (Kinnunen et al., 2019; Norwegian Institute of Public Health, 2021). Unfortunately, comparable data on the use of smokeless nicotine products such as nicotine pouches is not currently available.

In 2019, on average 40% (18–65%) of 15–16-year-old Europeans had used e-cigarettes at some point in their lives, and 14% (5.4–41%) had done so during the previous 30 days. Regarding the 11 countries included in this study, in 2019 e-cigarette use during the previous 30 days was most common in Iceland (17%), Germany (16%) and Ireland (15%), and least common in Portugal (6.3%) and Sweden (6.4%) (ESPAD Group, 2020). Data for Belgium was not available. Global data on adolescent e-cigarette use is still scarce, and thus global comparisons are difficult to conduct. Globally, around 2% of boys and 2% of girls use other novel tobacco products such as HTPs (WHO, 2021b).

Multiuse, referring to the use of two or more tobacco or nicotine products, has become a subject of public health discussions (Kasza et al., 2020; Stanton et al., 2020). A study in the US found that most young people who started using any tobacco and nicotine product had an increased risk of switching to multiple use (Kwon et al., 2021). Recent studies from Europe have also reported adolescents' multiuse. At least half of adolescents who use any tobacco or nicotine product use more than one product (Bowe et al., 2021; King et al., 2018). In a recent Nordic comparison, the proportions of dual use (most often cigarettes and e-cigarettes) and triple use were surprisingly high among experimental (24%–49%) and current users (31–42%), although single use (most often cigarettes) was still the most common (Raitasalo et al., 2022). In Finland, an increase has been witnessed in dual use combining snus and cigarettes (Kinnunen et al., 2019).

2.2 The tobacco endgame objectives and policies

The tobacco endgame has been discussed during the last decade, increasingly so in recent years (McDaniel et al., 2016; Puljević et al., 2022). The tobacco endgame discourse shifts the focus from decreasing tobacco use to ending the tobacco epidemic (Malone, 2013; McDaniel et al.,

2016; Thomson et al., 2012). There is no single definition of 'tobacco endgame': it refers to both the goal and the policies or strategies to achieve that goal (McDaniel et al., 2016; Puljević et al., 2022). The tobacco endgame aims for measurable outcomes that will mark an end of the tobacco epidemic (Malone, 2016; Thomson et al., 2012; van der Eijk, 2015). However, the goal may vary regarding the targeted use level (most often less than 5%) and whether the aim is to go smoke-free, tobacco-free or nicotine-free (Malone, 2016). The policies or strategies used to achieve the goal may also differ (McDaniel et al., 2016; Puljević et al., 2022). A recent review (Puljević et al., 2022) summarises the policies being used to target the tobacco endgame as follows: 1) product-focused (e.g., mandatory very low nicotine content standards, product standards that reduce smoking or remove cigarettes from the market, reduced-risk products); 2) user-focused (e.g., purchaser licences, tobacco sales restricted by year of birth); 3) market/supply-focused (e.g., the end of commercial retail sales, the imposition of a 'sinking lid' on supply, increases in tobacco taxes, restrictions on tobacco retailers); 4) institutional structure-focused (e.g., transferring the management of tobacco supply to an agency with a mandate to phase out tobacco sales).

An increasing number of European countries have framed their tobacco control strategies or legislation around the tobacco endgame objective. The tobacco endgame was broadly accepted by the European population a decade ago, when around one in three adults (and one in four smokers) was in favour of a comprehensive tobacco endgame intervention (Gallus et al., 2014). In 2010, Finland became the first country in the world to implement a tobacco endgame objective with its Tobacco Act, which aimed for less than 2% tobacco use by 2040. In 2016, this goal was broadened to cover all non-medicinal nicotine products, the target use level was adjusted from 2% to 5%, and the target date was brought forward to 2030 (Finlex, 2016; Finnish Government, 2009). In other European countries, for instance, the Irish government has set the objective to go tobacco-free by 2025 (Department of Health, 2013), Scotland is aiming for 2034 (Scottish Government, 2013), and the French health minister is aiming for a generation of non-smoking adults by 2032 (French Ministry of Solidarity and Health, 2018). To tackle the health burden caused by tobacco, in 2021 Europe's Beating Cancer Plan set the goal of a tobacco-free generation in Europe, with less than 5% of the population using tobacco products by 2040 (European Commission, 2021a).

2.2.1 The critical role of tobacco prevention

Preventing adolescents from initiating, using, becoming addicted to and being exposed to tobacco and nicotine is a key strategy to achieve the goal of a tobacco-free generation set out in Europe's Beating Cancer Plan (European Commission, 2021a). Preventive policies are an integral part of the provisions of the WHO Framework Convention on Tobacco Control (FCTC; WHO, 2003). The WHO FCTC is an evidence-based treaty that came into force in 2005; the EU and its member states (including all the countries in this study) ratified the treaty the same year (WHO, 2023).

The WHO FCTC requires countries to implement effective measures and cooperate with others to develop policies for the prevention and reduction of tobacco consumption, nicotine addiction and exposure to tobacco smoke (WHO, 2003). The WHO FCTC also provides a mandate for countries to implement the tobacco endgame: WHO FCTC Article 2.1 encourages countries to implement strategies that go beyond the requirements of the treaty. The WHO

FCTC is connected to the 2030 Agenda for Sustainable Development and its Sustainable Development Goals; implementing the WHO FCTC is one of the means to achieve Sustainable Development Goal 3, which aims to ensure healthy lives and promote well-being (WHO, 2015).

This study focuses on six WHO FCTC policies (Table 1). According to scientific evidence, these six policies are the most relevant to prevent uptake of and exposure to tobacco and nicotine during adolescence: price and tax measures (WHO FCTC Article 6), smoke-free environments (Article 8), product regulation (Article 9), packaging and labelling (Article 11), advertising, promotion and sponsorship (Article 13), and preventing product access by minors (Article 16) (WHO, 2003). To achieve the tobacco endgame, many other supply and demand reduction policies are also critical, such as cessation support (WHO FCTC Article 14), the monitoring of tobacco use (Article 20), and the prevention of the illicit trade in tobacco (Article 15).

Table 1.   Preventive WHO FCTC tobacco policies in this study

Price and tax measures (WHO FCTC Article 6)
Ensure an increase in the sale prices of tobacco products by increasing taxes to comprise at least 75% of the retail price of the most popular brands of cigarettes and prohibit or restrict sales of tax- and duty-free tobacco products.

Smoke-free environments (WHO FCTC Article 8)
Provide protection from exposure to second-hand smoke in indoor public places and hospitality venues (e.g., bars, restaurants, cafés), in indoor workplaces (e.g., schools and healthcare facilities), on public transport, and in other appropriate (outdoor and quasi-outdoor) public places.

Product regulations (WHO FCTC Article 9)
Reduce the attractiveness, addictiveness and toxicity of tobacco products by adopting and implementing effective legislative, executive, administrative or other measures to test, measure and regulate tobacco products' content and emissions.

Packaging and labelling (WHO FCTC Article 11)
Ensure that tobacco products carry warnings covering an average of at least 50% and not less than 30% of the package, with all the appropriate characteristics:
• Specific warnings are mandated and must be rotated.
• They must describe the harmful effects of tobacco use on health.
• They must be located on individual packs and on any outside packaging used in retail sales.
• They must be large, clear, visible and legible.
• They must be written in (all) the principal language(s) of the country.
• They must include pictures or pictograms.

Advertising, promotion and sponsorship (WHO FCTC Article 13)
Undertake a comprehensive ban covering all types of direct or indirect advertising, promotion or sponsorship in various channels: national television and radio, local magazines and newspapers, billboards (and all other outdoor advertising), point-of-sale advertising, free distribution by mail or other means, promotional discounts, identification of non-tobacco goods and services with brand names, use of brand names of non-tobacco goods and services for tobacco products, appearance of tobacco brands or products in television or film, sponsored events.

Preventing product access by minors (WHO FCTC Article 16)
Prohibit the sale of tobacco products to or by persons of less than 18 years of age, and limit underage persons' access to tobacco products by not selling tobacco products individually or in small packets and by ensuring that tobacco vending machines are not accessible to minors or are banned outright.

2.2.2 Inconsistent tobacco policy implementation across countries

To reach their behavioural and health targets, tobacco policies need to be properly implemented at national and organisational levels. A major change in tobacco policy has been witnessed during the past few decades. Before the 1980s, it was common for governments to collaborate openly with the tobacco industry; this has now been replaced by rather strict tobacco control (Cairney et al., 2012). However, even today, there is considerable inconsistency in the implementation of the WHO FCTC policies, both across the European countries (Joossens et al., 2022) and globally (WHO, 2021a).

The European Tobacco Control Scale (TCS), first introduced in 2006 and updated every three years, compares 37 European countries by quantifying their implementation of six core tobacco control policies: tax and price measures; smoking bans; prohibitions on tobacco advertising, promotion and sponsorship (TAPS); warning labels on packages; information-sharing; and smoking cessation support. The 2019 TCS best illustrates the situation at the time of my study (Joossens et al., 2020). It showed that seven countries (Finland, France, Iceland, Ireland, Israel, Norway and the UK) had comprehensive policies in place (60% or more of the total score); 15 countries (Austria, Belgium, Croatia, Greece, Hungary, Italy, Malta, the Netherlands, Romania, Portugal, Slovenia, Spain, Sweden, Turkey and Ukraine) had moderate policies in place (around 50% of the total score); and 14 countries failed to reach 50% of the total score. Three countries (Germany, Luxembourg and Switzerland) had very weak policies in place. If we compare the 2019 TCS rankings with the 2021 rankings (Joossens et al., 2022) for the countries included in my study, they improved the most in the Netherlands (from 14th to 9th place) and Denmark (from 29th to 13th place), whereas the greatest declines took place in Portugal (from 20th to 30th place) and Sweden (from 15th to 21st place).

2.2.3 Inconsistent enforcement of school tobacco policies

Schools have been seen as key settings for health promotion since the 1980s, when settings-based health promotion first entered the discussions. The Ottawa Charter for Health Promotion was the first to acknowledge health-promoting settings by stating that health is created in the settings where people live their everyday lives (WHO, 1986). This was reinforced by the Sundsvall Statement (WHO, 1991) and the Jakarta Declaration (WHO, 1997, p. 6). Generally, the aim of the settings approach is to shift the focus from targeting individuals' behaviour to changing the organisational structures and processes that influence health behaviours and the health of individuals within the organisation.

In line with this, schools are considered to be core settings for the prevention of adolescents' tobacco and nicotine use. School seems to offer a good potential environment to influence adolescents' smoking: most tobacco users worldwide start smoking between the ages of 15 and 20 years (Reitsma, Kendrick et al., 2021); school policies reach the majority of each age group for several years; schools are educative settings and hence natural for health promotion efforts; and social relationships in schools have a considerable influence on adolescents' behaviour (Aveyard et al., 2004). Thus, in alignment with WHO FCTC Article 8 on smoke-free environments, school tobacco policies (STPs) are widely implemented in European countries (Mélard et al., 2020). STPs describe where, when and to whom prohibitions against the use of

tobacco products apply, and the consequences of violating the rules (Agaku et al., 2015; Aveyard et al., 2004).

However, the scientific evidence on STPs' effectiveness in decreasing adolescent smoking is inconclusive. Research shows that STPs can decrease adolescents' exposure to second-hand smoke (Azagba et al., 2016; Coughlin et al., 2015; Frazer et al., 2016), but evidence regarding their impact on smoking behaviour remains inconclusive (Coppo et al., 2014; Galanti et al., 2014). Some studies suggest that STPs decrease the likelihood of young people smoking (Overland et al., 2010; Piontek et al., 2008), while others state that STPs have no effect or may even increase smoking (Darling et al., 2006; Kuipers et al., 2016). A systematic review by Galanti et al. (2014) synthesised evidence from over 30 years and was the first to thoroughly investigate why studies of STP effectiveness report such varying findings. It concluded that studies often lacked a focus on implementation, and it stressed school staff members' strict and consistent enforcement of STPs as a core factor in STPs' effectiveness in decreasing adolescent smoking (Galanti et al., 2014). Consistent enforcement refers to the systematic monitoring of students' compliance with STPs and intervention in rule violations.

More recent research has also stressed that consistent STP enforcement is critical (Kvillemo et al., 2021; Mélard et al., 2020; Rozema, Mathijssen, van Oers et al., 2018; Schreuders et al., 2017). For instance, in their realist review, Schreuders et al. (2017) explain that inconsistencies can cause adolescents to use gaps in enforcement as opportunities to smoke, develop pro-smoking social meanings around rule violations, reduce their acceptance of the school's authority over their smoking, and perceive sanctions associated with breaking the smoking rules as unfair and biased. Staff's consistent enforcement seems to support the normalisation of STPs into the routine practices and culture of the school – which has also been used as a definition of successful policy implementation within an organisation (Hjort et al., 2022; May & Finch, 2009; May et al., 2009). However, STP enforcement seems to vary within and between schools (Lipperman-Kreda et al., 2009; Mélard et al., 2020; Turner & Gordon, 2004).

2.3   Tobacco research lacks a focus on policy implementation

Although there is a need for more comprehensive and consistent implementation of preventive tobacco policies at both school and national levels, tobacco research has been less focused on implementation. For instance, although policymaking is nuanced and complex (Cairney, 2016), and scientific evidence is only one of the factors that influence political decision-making (Larsen, 2008), most tobacco research has focused on producing findings with no explicit focus on national policymaking processes (Willemsen, 2018). However, research that does have this focus is slowly increasing (Albæk et al., 2007; Bryan-Jones & Chapman, 2006; Kuijpers et al., 2018, 2019; Kurzer & Cooper, 2016; Studlar, 2007; Young et al., 2010). Bryan-Jones and Chapman (2006), for example, examine the political dynamics that influence the implementation of smoking bans to prevent second-hand smoke exposure. They conclude that regulations have been delayed for several reasons, such as the tobacco industry's successful opposition to policy implementation, and political perceptions that there is insufficient public support to ban smoking in public places. The authors insist that governments should address second-hand smoke exposure as a fundamental health issue and that the visibility of public support for stricter policies should be reinforced. Willemsen (2018) also considers public support to be critical for policymaking. His 'flywheel' model of tobacco control portrays change as a process of mutual reinforcement between the implementation of policy, a decrease in smoking prevalence, and support for stricter policies among the public and decision makers (Figure 1).

Figure 1.   Flywheel of tobacco control (modified from Willemsen, 2018, p. 90)
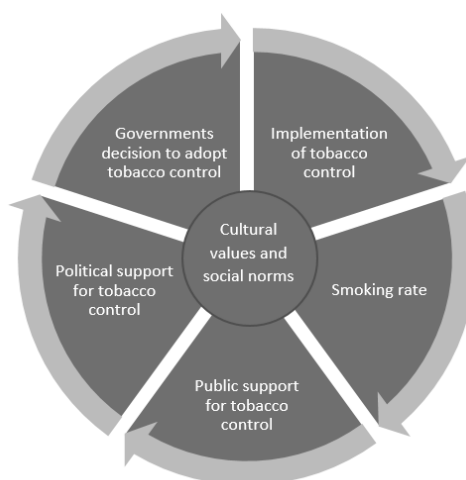
The relative lack of focus on implementation is also an issue in wider public health policy research (Nilsen & Cairney, 2020; Purtle et al., 2015; Selin et al., 2020; Tinkle et al., 2013). This is worrying considering the fundamental role played by these policies in the health of populations (Bhattacharya, 2013; Fafard et al., 2022). Reviews of the most important public health achievements between 1900 and 1999 in the United States (Centers for Disease Control and Prevention [CDC], 1999) and between 2000 and 2010 worldwide (CDC, 2011) showed

that all such achievements were influenced by public policies such as seatbelt laws, vaccinations, and smoke-free policies. The Ottawa Charter stresses healthy public policies as one of the five core action areas for health promotion (WHO, 1986).

Research on the implementation of STPs is also rather scarce, and despite the critical role played by staff enforcement in STPs' effectiveness, there is little research on staff behaviour. Some studies exist that show various possible facilitators and barriers for staff's STP enforcement, but these studies fail to identify the factors that are the most relevant or the causal pathways via which they influence staff's STP enforcement. Gordon and Turner's (2003) study explained the difficulties that staff encounter when enforcing STPs. The study showed that staff's STP enforcement was influenced by the perceived effectiveness of STPs as well as the staff's personal and professional values, sense of authority, and perceptions of their own safety. Ashley et al. (1998) demonstrated that STP enforcement increased workloads and led to conflicts with students. They called for stronger societal support for STP enforcement, such as increases in tobacco prices. Pickett et al. (1999) stressed the need to gain staff members' support for STPs and develop strategies to deal with such policies' potential negative outcomes, such as safety risks to students who leave school property to smoke.

Rozema and colleagues (Rozema et al., 2016; Rozema, Mathijssen, Jansen et al., 2018; Rozema, Mathijssen, van Oers et al., 2018) have studied STPs' implementation in different phases and found many factors that might play a role. For instance, existing workloads and resources, organisational support, staff's outcome expectations, and the size of the school grounds all seem to influence the adoption of STPs (Rozema et al., 2016). Similar factors including resources, school culture and societal factors also influence the enforcement of STPs, and schools overall seem to encounter considerable challenges in STP enforcement (e.g., defining the responsibilities for enforcement, determining the sanctions for violations, and motivating all staff to enforce the ban) (Rozema, Mathijssen, Jansen et al., 2018). Strict enforcement is important to sustain schools' outdoor smoking bans, but this is often hard to achieve – for instance, due to staff members' other work burdens. The authors stress overall that more focus is needed on studying and supporting staff with regard to STP enforcement (Rozema, Mathijssen, van Oers et al., 2018).

3 AIMS OF THE STUDY

In this doctoral thesis, I analyse the implementation of preventive tobacco policies at schools and national level. I aim to explain how contextual factors interact with policies and influence their implementation via certain mechanisms. At the national level, preventive tobacco policies refer to price and tax measures (WHO FCTC Article 6), smoke-free policies (Article 8), products regulations (Article 9), packaging and labelling (Article 11), TAPS (Article 13), and preventing products access by minors (Article 16); at the school organisational level, they refer to STPs (WHO FCTC Article 8). My main interest is at the school level of policy implementation, but I also address national-level policy implementation and the interactions between the school organisational and national levels. I consider the emerging challenges that smokeless and novel tobacco and nicotine products are causing for tobacco prevention by studying whether national legislation and regulations are being extended to these products in the Nordic countries. I synthesise my findings into a programme theory that explains the causal pathways of tobacco policy implementation at national and school levels, and I discuss implementation strategies to move towards the tobacco endgame within and across countries. My ultimate objective is to contribute to the discussion that aims to support the effectiveness of tobacco policy to decrease youth tobacco and nicotine use and thus to prevent a high burden of tobacco- and nicotine-related diseases in the future. The main aims are as follows:

1. The school-level analysis (Articles I–III) aims to explain how contextual factors influence school staff members' enforcement of STPs and staff's confidence to cope with students' negative responses during enforcement, and the considerations of why staff ignore the violations of some persistent STP violators.

2. The national-level analysis (Article IV) aims to assess and compare the implementation of preventive tobacco policies in national legislation and regulations in the Nordic countries, including their application to smokeless and novel tobacco and nicotine products, and to discuss the contextual factors that may explain the similarities and differences in policy implementation.

3. Based on the national- and school-level results, the aim is to formulate a programme theory that explains how the contextual factors interact with the policies and influence policy implementation at national and school levels via certain mechanisms.

4 CONCEPTUAL FRAMEWORK

4.1 Two research fields that study implementation: From policy to practice

Research on the implementation of interventions is conducted within policy implementation research (PI) and implementation science (IS) (Nilsen & Cairney, 2020). Both fields are driven by a desire to understand and explain the problems involved in transforming knowledge into desired changes, and to produce understandings that can bridge the research-practice gap. However, PI and IS focus on different implementation objects. PI focuses mainly on 'upstream interventions' such as national legislation and regulations, whereas IS focuses on 'downstream interventions' such as organisational guidelines and practices. Thus, both fields are needed to explain tobacco policy implementation at the national and school organisational levels. Although PI and IS emphasise interdisciplinarity, knowledge exchange between the two fields has been scarce. The need for collaboration has been suggested during the past decade (Allen et al., 2020; Emmons & Chambers, 2021; Fafard & Cassola, 2020; Gagnon et al., 2017; Johansson, 2010; Nilsen & Cairney, 2020; Nilsen et al., 2013).

4.1.1 Policy implementation research

Policy implementation research (PI) examines how governments put policies into practice and the related policymaking processes (Cairney, 2016; Howlett & Ramesh, 2003; Pressman & Wildavsky, 1973; Saetren, 2005). PI is grounded in social sciences such as public policy, political sciences and public administration/administrative sciences. It started in the 1970s, although interest in PI among policy scholars seemed to decline during the 1990s (O'Toole, 2000). There are various reasons for this (Nilsen & Cairney, 2020; Saetren, 2005). First, the competition between two divergent analytical approaches labelled 'top-down' and 'bottom-up' became frustrating for scholars. Second, the rationalistic idea of separate stages in the policy process (i.e., agenda-setting, adoption, implementation etc.) was considered to oversimplify the complex policy process. Third, the change from hierarchical (i.e., centralised) state-society relations to a more horizontal (i.e., decentralised/multicentric) relationship shifted governments' focus from public policy to the economy and market-based policy instruments. This change in state-society relations also led to the development of new terms to capture the novel governing styles and shifted the research focus to institutional and interorganisational relationships. There has been a call for more focus on policy implementation in the field (Hill & Hupe, 2009; Saetren, 2005; Winter, 2006).

What has PI provided for the thesis? For this study, PI has provided an understanding of complex and nuanced national policymaking processes. I have utilised Cairney's (2012; Cairney et al., 2012) framework, which synthesises key political science theories into five core factors that are relevant to political decision-making, and Willemsen's (2018) conceptual framework, which specifies the relationship between these factors in the tobacco control policymaking processes (Figure 2). According to Cairney (2012; Cairney et al., 2012), the five key factors that influence

policymaking are context/societal factors, institutions, networks/interest groups, agenda-setting/framing and diffusion/transfer of ideas:

1. *Context* refers to the environments where policymaking occurs, such as the social environment (e.g., public support for policies), the cultural environment (e.g., ideologies about who is responsible for the individual's health behaviours and health) and the economic environment (e.g., the economic importance of tobacco for the national economy).
2. *Institutions* refers to national policymaking systems, including their rules and processes, and to the specific institutions that are responsible for the policies in question (such as health ministries for tobacco policies).
3. *Networks* refers to policy advocates/interest groups, who are often organised in policy coalitions. These policy advocates aim to influence policymaking by providing information and advice to frame and address problems (e.g., tobacco use).
4. *Agenda-setting/framing* refers to the extent to which policymakers understand a certain issue (such as tobacco use) as a policy problem, the level of importance allocated to the problem on the political agenda, and the policy choices that are considered to be the most suitable to address the problem.
5. *Diffusion/transfer of ideas* refers to scientific information and best practices coming from within the country/government, from other countries/governments or from international organisations such as the EU and WHO.

Figure 2. Conceptual framework for understanding tobacco control policymaking (from Willemsen, 2018, p. 10)
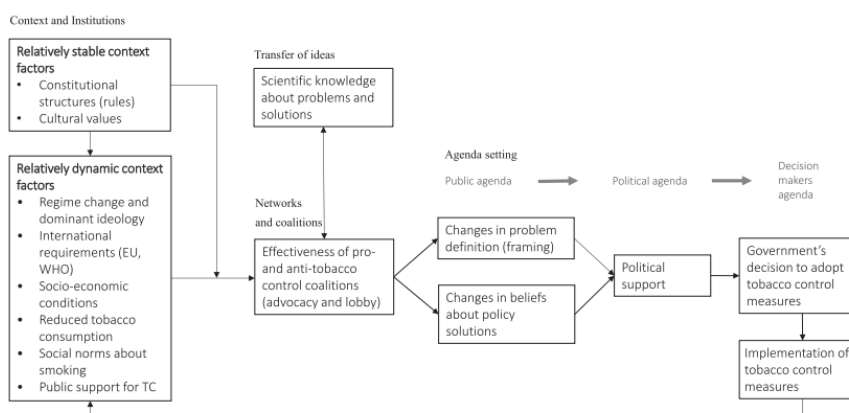
4.1.2 Implementation science

Where policy implementation research (PI) focuses mainly on national level implementation, implementation science (IS), in turn, focuses on organisational-level implementation. IS was first established as 'a study of methods to promote the adoption and integration of evidence-

based interventions […] into routine practice, and hence, to improve quality and effectiveness of health services' (Eccles & Mittman, 2006). It aimed to provide a systematic approach to identify and address barriers to and facilitators of change and improved practice at the organisational level (i.e., evidence-based implementation strategies) (Bauer et al., 2015). Its origins lie in the emergence during the 1990s of evidence-based medicine and its application in evidence-based practice (Bauer et al., 2015; Chambers, 2012). Thus, it was initially strongly influenced by medical research and natural science research practices in healthcare settings. However, more recently IS has been utilised in a wide range of settings outside the health services, and its development and maturation have been characterised by increasing multidisciplinarity, versatile use of theories and a mixed-method approach (Bauer et al., 2015; Chambers, 2012).

What has IS provided for this doctoral thesis? IS has provided this study with an understanding of the core factors that influence policy implementation at the organisational level. I have utilised Nilsen's (2020) synthesis of five core factors that are relevant to organisational-level policy implementation:

1. Characteristics of the *implementation object* (i.e., the intervention being implemented).
2. Influences of *the implementer* (i.e., the individuals carrying out the intervention).
3. Influences of *the target* (i.e., the individuals or organisations at whom the policies are aimed).
4. *Context* (i.e., the circumstances in which the policy is implemented).
5. The effectiveness of the *implementation strategies* (i.e., methods to enhance the implementation).

The relationships and interactions between these factors are shown in Figure 3. The figure illustrates a system/setting approach to implementation by acknowledging multiple levels of influence and interdependency across factors (Holmes et al., 2012; Nilsen, 2020). This indicates that multiple factors and their interactions must be addressed in order to support implementation. In Table 2, I briefly and simplify compare these IS factors with PI and illustrate how I approach them in this study.

Figure 3. Core factors influencing implementation at the organisational level (modified from Nilsen, 2020, p. 17)
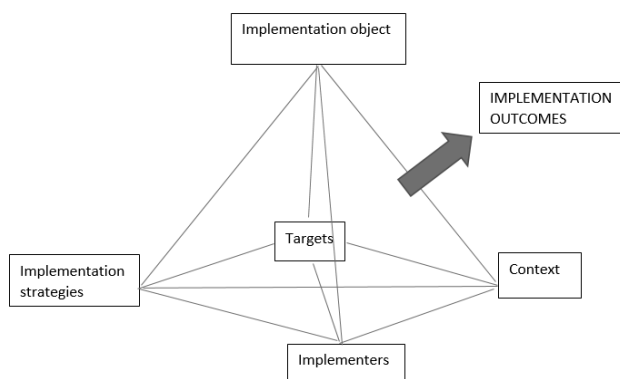
Table 2. Description of how Nilsen's core implementation science (IS) factors are approached in policy implementation research (PI) and in this study

Factor	IS	PI	This study
Implementation objects	Mainly organisational-level policies, such as clinical practices or guidelines.	Mainly national-level policies, such as legislation and regulations.	Article IV: preventive tobacco policies (WHO FCTC Articles 6, 8, 9, 11, 13, 16) as national level implementation objects. Articles I-III: school tobacco policies (STPs, WHO FCTC Article 8) as organisational level implementation objects.
Implementers	People working in the organisation, e.g., healthcare practitioners.	People carrying out policies, who are called *street-level bureaucrats* or front-line staff; *organisations* in which the street-level bureaucrats work, such as government authorities and public/private entities; and *networks* of individuals and organisations.	Article IV: national-level policymakers. Articles I-III: schools and school staff members.
Targets	People using or targeted by the services of the organisation, e.g., healthcare patients.	People towards whom the policies are targeted, e.g., citizens and organisations.	Articles I-IV: Adolescents on whose behaviour preventive tobacco policies aim to have an impact.
Context	Multilayered (focused mainly on individual and organisational layers) and active.	Multilayered (focused mainly on social and societal layers) and active.	Articles I-IV: Multilayered (individual, social, organisational/school, societal, European and global layers), interacting and active.
Outcomes	Three types of outcomes are typically differentiated: *implementation outcomes* (e.g., acceptability, adoption, feasibility, fidelity), *service outcomes* (e.g., effectiveness, equity) and *patient outcomes* (e.g., mortality, health status, quality of life).	Two types of outcomes are typically differentiated: *output* is the impact on the implementers (e.g., adopting legislation that requires schools to implement comprehensive STPs), and *outcome* is the impact on the targets (e.g., a decrease in smoking prevalence).	Article IV: enactment of the respective WHO FCTC provisions into national legislation and regulations (adoption in IS/PI) as national level implementation outcome. Articles I- III: staff members' consistent enforcement of STPs (fidelity/compliance in IS/PI) as organisational level implementation outcome
Implementation strategies	Means and methods utilised to facilitate the implementation process to achieve desired outcomes. Numerous taxonomies have been developed to categorise different strategies and their effectiveness.	Strategies are referred to as policy instruments (or government instruments) and merely considered to be integral parts of the policy itself.	Articles I-IV: Changes to policies or contextual factors to facilitate policy implementation.

4.2 The role of context in explaining the complexity of policy implementation

Context – often referred to as the conditions, environments or circumstances in which a policy is implemented – is considered to have a crucial impact on implementation processes and outcomes. However, understandings of what context consists of and how it affects implementation vary across implementation studies. In PI, implementation takes place in real-

life circumstances, and thus the role of context cannot be overlooked (Nilsen & Cairney, 2020). Context is a more novel but increasingly acknowledged feature in IS, as implementation in real-life circumstances has become more common (Brownson et al., 2022; Daivadanam et al., 2019; Nilsen & Bernhardsson, 2020).

How do I define complexity in this study? The current challenge in the complexity discourse is that there is no general agreement on complexity; instead, various approaches exist (Pawson, 2013). In this study, I draw on Pawson's (2013) 'VICTORE' (volitions, implementation, contexts, time, outcomes, rivalry and emergence) approach to define complexity in policy implementation. This approach acknowledges that complexity lies in the interactions within and between various components, and that the consequences of those interactions are not totally predictable.

1. *Volitions:* Targets are active agents, not passive recipients. It is the actors' reasoning, interpretation and volition that causes behavioural change, not the policies themselves.
2. *Implementation:* Implementation chains are long regarding the institutions and actors needed to design and deliver policies. Due to the various actors and their interconnections, implementation is prone to inconsistencies, delays and unintended consequences, and thus is never linear.
3. *Contexts:* Context refers to the conditions/circumstances/environment where the policy is played out. It is an integral part of a policy's implementation and effects. Contexts are complex, multilayered, intertwined and constantly evolving, and thus policies are never implemented in similar circumstances.
4. *Time:* The history and timing of the policy will affect the implementation outcomes, for instance by defining the characteristics of the social phenomenon targeted by the policy.
5. *Outcomes:* Policies often lead to multiple outcomes, and these may account for consequences, no consequences, or unintended (positive or negative) consequences.
6. *Rivalry:* Policies are situated in policy-saturated worlds. As policies are intertwined, the impact of a single policy is difficult to assess.
7. *Emergence:* Components in a system combine and produce new components, and thus the system under investigation is continually changing. Change is never totally controllable or predictable. Policies may also change behaviours by first changing conditions, which then trigger a behavioural change (Pawson, 2013).

Context is defined as one of the key sources of complexity, and the context itself is also a complex construct. Despite the varying definitions of context to be found in implementation studies, there seems to be general agreement that it is a multilayered construct. Pawson (2013) divides context into four layers:

1. *Individual:* Stakeholders' various characteristics and capacities.
2. *Social:* Interactions between the stakeholders carrying out the policy.
3. *Organisational:* The rules, norms, practices and culture of the setting.
4. *Societal:* The wider social, economic and cultural environment.

The multilayered nature of context is also supported by the ecological models used in various disciplines and fields such as public health, sociology and education (e.g., Bronfenbrenner, 1979; McLaren, 2005).

The multilayered nature of context is also acknowledged in IS and PI. For IS, it is common to differentiate between the *inner* and *outer context* (e.g., Damschroder et al., 2009; Nilsen & Bernhardsson, 2020). The inner context refers to factors within the organisation, such as financial resources, leadership and organisational culture, as well as the characteristics of the implementers; the outer context refers to the environment beyond the organisation, such as national regulations or collaborations with other organisations. Although PI does not distinguish between inner and outer contexts, similar reasoning occurs. In PI, the inner context might be understood to refer mainly to the social interconnections between the implementers (e.g., organisations), which has been the focus of 'bottom-uppers' in particular (Barrett, 2004; Hjern, 1982; Lipsky, 1980; Nilssen & Bernhardsson, 2020; Room, 2011). The outer context is usually understood to include aspects of the societal and global environment in which the policies are implemented, such as demographic characteristics (Cairney, 2012; Hill & Hupe, 2009).

As PI and IS mainly focus on different contextual layers (IS on individual and organisational layers, PI on social, societal and global layers), they are likely to provide complementary understandings of the contextual factors that influence tobacco policy implementation at national and school organisational levels. It seems important to consider all contextual layers because according to Pawson (2013) the layers *interconnect*, and thus it may be difficult to understand one layer, or the emergence of unintended outcomes, without understanding the context as a whole. Pawson also noted that contexts are an integral part of policy implementation and that they *actively* influence the outcomes. Context is also considered to be active in PI and IS, where it is seen as a driving force required to achieve successful implementation (Daivadanam et al., 2019; Damschroder et al., 2009; Nilsen & Bernhardsson, 2020).

How do I approach context in this study? In this study, I define context as a *multilayered* construct that consists of individual, social, organisational/school, societal, European and global layers, with *interactions* both within and across layers. I also refer to *outer context* – which at the school level indicates to the societal context, and at the national level to the European and global contexts. It is noteworthy that many of the factors that influence policy implementation in general, such as targets, are considered in this study as contextual factors (e.g., the target as part of the social contextual layer). In this study, context is also seen as *active*, and thus the implementation strategies suggested in Chapter 7, along with the general discussion, are intended mainly to strengthen the context to support policy implementation.

Understanding context as multilayered, interacting and active allows me to define schools as social complex adaptive systems (SCAS) (Keshavarz et al., 2010). Schools as SCAS indicates that the functioning of the school is shaped by the interactions among various actors such as school staff (i.e., *implementers*) and students (i.e., *targets*). These individuals base their actions on the school's formal and informal rules, practices and culture (i.e., *organisational/school context*). Individuals' actions are also interconnected: one person's actions change the context for others (i.e., *social context*) (Plsek & Greenhalgh, 2001). Schools have autonomy but are also part of a network of systems that impose multiple constraints. These other systems may be bigger than the school, such as the national educational system or national tobacco control (i.e., *societal context*), or smaller than school, such as families (*i.e., social context*) (Kezhavarz et al., 2010).

5 CRITICAL REALISM, DATA AND METHODS

5.1 Key characteristics of the study

My thesis applies a cross-country research design using qualitative methods with critical realism as an ontological basis. Despite its potential to unravel complexity in policies and policy implementation, this approach has rarely been used in tobacco research. The characteristics of the individual articles are described in Table 3. All the articles were produced as part of two international research projects focusing on tobacco prevention among adolescents. Articles I–III relate to SILNE-R -project, funded by EU Horizon 2020 between 2015 and 2018 (European Network of Smoking and Tobacco Prevention SILNE-R, n.d.; Kunst, 2016; Tampere University SILNE-R, n.d.). SILNE-R aimed to evaluate how and why tobacco programmes and policies succeed or fail in achieving a decrease in adolescent smoking, and thus to provide strategies and recommendations regarding how policies and programmes can be implemented to maximally contribute to a reduction in youth smoking in Europe.

Article IV relates to NADNIC -project, funded by the Nordic Cancer Union between 2020 and 2022 (Tampere University NADNIC, n.d.). NADNIC focused on comparing similarities and differences in the Nordic countries in relation to adolescents' perceptions, experiences and use of smokeless and novel tobacco and nicotine products. It also compared the countries' regulatory schemes, including possible gaps and novel approaches. The aim of the project was to contribute to the development and implementation of effective policies to decrease the use of tobacco and nicotine products.

Table 3.   Characteristics of the individual articles

	Article I	Article II	Article III	Article IV
Data	40 scientific articles on STP enforcement.	81 semi-structured interviews with school staff members from 7 European cities.	69 semi-structured interviews with school staff members from 6 European cities.	Information on the implementation of strategies, acts and regulations, from global and national tobacco control databases, websites and scientific articles.
Methods	Realist review.	Thematic analysis.	Thematic analysis.	Narrative review.
Contribution to the thesis	The programme theory produced in the article provides a basis for understanding schools' staff members' enforcement of STPs in this study.	The article analyses staff's confidence to cope with students' negative responses during STP enforcement. This enables the refinement of the programme theory.	The article analyses enforcement with vulnerable students who persistently violate STPs and explains why staff may not intervene in their rule violations. This enables the refinement of the programme theory.	The article extends the analysis from organisational-level policy implementation to the national level, from smoke-free environments (WHO FCTC Article 8) also to other policies (Articles 6, 9, 11, 13, 16), and from smoked tobacco (e.g., cigarettes) to other products such as smokeless tobacco (e.g., snus) and novel tobacco and nicotine products (e.g., e-cigarettes, heated tobacco products and nicotine pouches). This enables the refinement of the programme theory.

5.2 Critical realism as an ontological basis

Critical realism provides the ontological basis for the structuring and explanation of causality in my thesis. I have applied this approach because it allows me to explain the mechanisms/causal powers through which the interconnections between contexts and policies influence implementation. Although there are diverse schools of critical realism, all of them posit that the reality is stratified into the 'real', the 'actual' and the 'empirical' (Archer et al., 2016; Bhaskar, 1978; Collier, 1994; Jagosh, 2019; Mingers, 2014). The empirical refers to empirical regularities/experiences (e.g., a decrease in adolescent smoking). The actual indicates events that can be observed (e.g., there are students who smoke during breaktimes, or there are staff members who monitor student behaviour). The real denotes the generative mechanisms or causal powers (the latter concept being mainly used by contemporary critical realists) that generate observable outcomes in the actual and the empirical.

These causal powers/generative mechanisms cannot be directly observed, but they exist unconditionally in human agency or in physical, social or conceptual entities/structures (e.g., nicotine has the power to cause addiction, a person has the power to learn, and inequitable distribution has the power to cause poverty). The causal powers/generative mechanisms that operate in the real will manifest themselves in the actual and the empirical (i.e., become observable) only when the context and interacting causal powers/generative mechanisms allow it. However, the causal powers/generative mechanisms exist even if it is not always possible to observe and witness them empirically. As illustrated in Figure 4, the real (causal powers/generative mechanisms) is a superset of both the actual (events) and the empirical (experiences/empirical regularities).

Figure 4. The stratified world and causal explanations in critical realism (modified from Rutten, 2021)
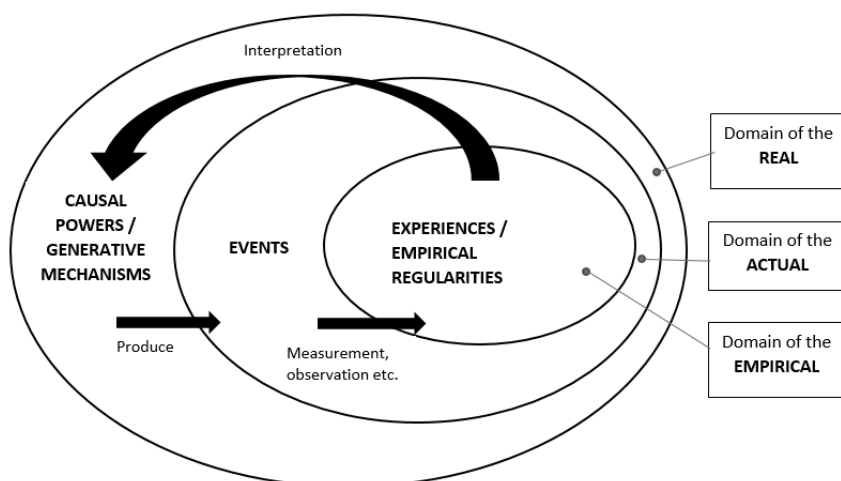
Rutten (2021) explains the interactions between the real, the actual and the empirical, as well as interactions within the real, with the following example (modified to serve this study). Owning bin lorries, employing bin workers and having a waste collection schedule gives a city

the causal power/generative mechanism to collect waste (the real). However, rubbish will be collected (an observable event in the actual) only if the bin workers use their agency to execute the power. For instance, the bin workers may be on strike due to the power of the labour union to organise strikes (the real), or the bin lorry may break down (inhibiting context). The observable events that happen in the domain of the actual are the outcome of multiple causal powers/generative mechanisms and contextual factors interacting mainly in the real.

Critical realists' perception of a stratified world is different from how public health research generally perceives causality (Connelly, 2007; Dunn, 2012; Jagosh, 2019; Jagosh et al., 2014; Pawson, 2006; Schreuders, Stronks et al., 2020). Public health research is often based on a positivist ontology, and thus causal claims are mainly presented when a successive relationship exists between separate events. For instance, if a decrease in adolescent smoking is witnessed after the introduction of a tobacco advertising ban, it may be deduced that the ban caused the decrease in smoking (i.e., successive causation). In critical realism, however, this would represent an observed regularity in the empirical, but not directly causality, as it does not unravel the causal powers/generative mechanisms that operate in the real. Critical realism assumes that causality lies in the causal powers/generative mechanisms (e.g., the advertising ban's ability to change people's perceptions of the image of smoking) that then produce a decline in adolescent smoking (i.e., generative causation). Thus, according to critical realism, one can make causal claims by identifying the causal powers/generative mechanisms operating in the real that explain how an advertising ban may lead to a decrease in adolescent smoking.

Critical realism denotes that social science phenomena can be explored similarly as the natural science phenomena (Bhaskar, 1978), even though social phenomena inevitably operate in 'open' systems that are in constant and uncontrollable interaction with the environment and thus somewhat unpredictable (yet not chaotic) compared with phenomena in the natural sciences, where experiments can take place in more (yet never totally) 'closed' systems (Mingers, 2014). However, critical realists also stress that the knowledge produced is always contingent, partial and fallible (i.e., epistemic relativism) (Archer et al., 2016).

5.3   A realist review to explain staff enforcement of school tobacco policies

The realist methodology is a theory-driven approach for evaluation and synthesis that develops explanatory theories (i.e., programme theories) about policies (Connelly, 2007; Dunn, 2012; Jagosh, 2019; Jagosh et al., 2014; Pawson, 2006, 2013; Pawson & Tilley 1997; Schreuders, Stronks et al., 2020). It has its origins in the social sciences, where it was initially developed to evaluate complex social programmes. Realist methodology builds on the philosophical insights of critical realism, such as the notion of a stratified world, and some of its key concepts, such as 'mechanism', are based on those ontological principles. I applied the realist methodology explicitly in Article I, which is a realist review (i.e., realist synthesis) explaining staff enforcement of STPs. The review process is explained in detail in the article. Here I present the review by drawing on key features of the realist approach outlined by Schreuders, Stronks et al. (2020). Their paper was produced as part of the SILNE-R project, and it uses my realist review as one of two case studies.

Scientific objective: The realist approach does not explain policy effectiveness as such (i.e., does a policy work), but rather how, for whom and in what circumstances a policy works. Thus, in Article I, the aim is not to explain whether STPs lead to staff enforcement or not per se, but

instead to explain how staff members' responses, which comprise their STP enforcement, differ due to varying contextual factors.

Causal explanations: In a realist approach, causal explanations are presented in the form of *CMO configurations*: contexts (C) allow (or not) the emergence of mechanisms (M) that produce outcomes (O). *Context* is defined as anything in the environment/backdrop of the policy that may influence the emergence of mechanisms. Contextual factors appear in various contextual layers, ranging from individual factors (e.g., individual skills) to societal factors (e.g., the ideology that dominates in the society). *Mechanisms* are the causal powers that produce the outcomes. In social interventions, mechanisms are often defined as stakeholders' cognitive or emotional responses to the resources that the policy provides. Mechanisms operate in the real and are problematic to define empirically, and this requires the making of theorical claims. *Outcomes* are empirically observable consequences of the mechanisms. In Article I, we sought to explain how contextual factors in the individual, social, school, implementation and national layers (context) trigger staff members' cognitive, psychosocial and behavioural responses (mechanism) that may support their STP enforcement (outcome). Figure 5 illustrates these causal pathways in realist approach.

Figure 5. Causal pathways in the realist approach (modified from Wong, Westhorp et al., 2013, p. 5)
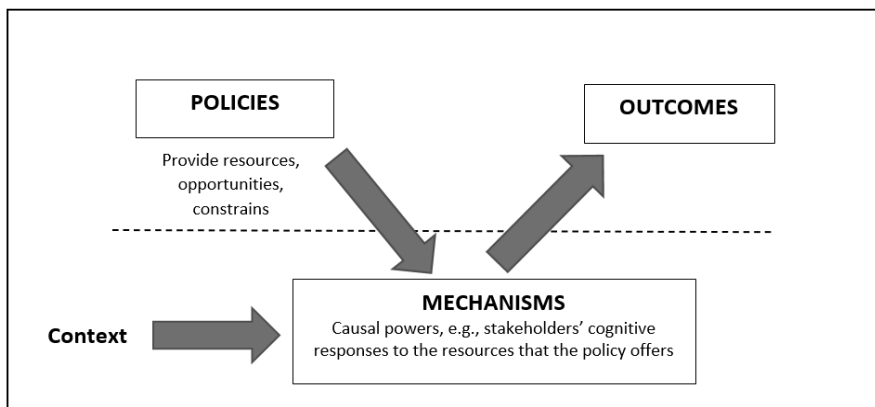
Stepwise accumulation of a programme theory: In the realist approach, CMO configurations are combined into a programme theory that explains how, for whom and under what circumstances programmes/policies may work. The programme theory is revised and refined during the research process. In Article I, we used recent literature reviews on STPs, policy reports and guidelines for STP implementation in Finland, and a narrative review of the implementation of health-promoting schools to produce an initial understanding of the CMOs with regard to staff's STP enforcement. This literature mainly provided us with an understanding of contextual factors, but it did not explain the possible mechanisms through which those factors might influence staff's STP enforcement. Therefore, I interviewed people in Finland who had long professional experience of STP implementation: an expert from the Finnish National Institute for Health and Welfare, a school headteacher, and three teachers from different schools. The CMOs were combined into an initial programme theory that can be found in the article.

To revise the initial understanding, we conducted a systematic literature search. We identified 40 English-language articles for synthesis. The relevant pieces of evidence (on context, mechanisms or both) were extracted from the selected articles, analysed and synthesised to refine and substantiate the initial programme theory. The search for primary studies, the selection and appraisal of the studies, the extraction, analysis and synthesis of relevant data, and the refinement of the programme theory followed the steps of realist reviews (Pawson, 2006) and RAMESES publication standards for realist reviews (Wong, Greenhalgh et al., 2013). The revised programme theory is illustrated in Figure 6 in Chapter 6. In the thesis, this programme theory was further refined by the evidence produced in Articles II–IV. The final programme theory for the thesis, summarising the results of all four articles, is presented in Figure 9 in Chapter 7.

Integration of multiple types of data: In the realist approach, often-used evidence hierarchies are set aside; instead, all types of data – meaning qualitative and quantitative scientific knowledge as well as expert and lay knowledge – are treated as partial and contributory. As explained above, we utilised multifaceted data to produce the initial programme theory, including systematic and narrative literature reviews, policy reports and guidelines as well as stakeholder interviews. All the data was partial and complementary: while the literature provided understandings of the context, the interviews better explained the possible mechanisms.

Lessons from similar programmes/policies: In the realist approach, policies that aim for behavioural change are perceived to belong to one or more families of programmes. Policies within the same family aim to trigger similar mechanisms and are often successful under similar circumstances. For instance, to revise the initial programme theory in Article I, we conducted two distinct literature searches, one on STPs (search strategy 1) and the other on health-promoting schools (search strategy 2). We performed the second search strategy because the literature on STP implementation was scarce but there was more literature on the implementation of health-promoting schools. The literature on health-promoting schools provided valuable understandings to explain staff's STP enforcement, as they shared the same setting and school staff were implementers in both cases.

5.4 Thematic analysis of interviews with school staff in seven European cities

Articles II and III employed interview data on the enforcement of STPs that was generated with 84 school staff members from 28 secondary schools in seven European cities: Amersfoort (the Netherlands), Coimbra (Portugal), Dublin (Ireland), Hanover (Germany), Latina (Italy), Namur (Belgium) and Tampere (Finland). The seven countries vary considerably in their national tobacco control policies and strategies. All the cities are of medium size and close to the national average regarding socio-economic level and share of the foreign population. In each country, three or four schools were included in the study. The schools represented different tracks (academic or vocational) or were situated in areas with different socio-economic levels. The schools were recruited from those that had already participated in the SILNE-R school survey. The survey data provided information on the prevalence of student smoking in these schools. Table 4 shows the smoking rates in the schools and an overview of the school rules and national legislation on STPs.

Table 4. Overview of government laws on school tobacco policies (STPs), student smoking, and school rules on smoking in the seven European countries included in the study (Article II)

Country	Government law in 2016: Prohibition on students and staff smoking in schools	School	Student weekly smoking[a] %	STPs in 2016: Which students are not officially prohibited from smoking during school hours, and where[b]
Belgium	No smoking in school buildings or on the premises	1	8.2	4th graders (avg. 15–16 yo) and above, outside the premises
		2	23	4th graders (avg. 15–16 yo) and above, outside the premises
		3	14.3	Any student with parental permission to leave for lunch, outside the premises
		4	6.2	4th graders (avg. 15–16 yo) and above with parental permission to leave for lunch, outside the premises
Finland	No smoking in school buildings or on the premises	1	8.4	No smoking during school hours
		2	8.3	No smoking during school hours
		3	5.6	No smoking during school hours
		4	2.4	No smoking during school hours
Germany	No smoking in school buildings or on the premises	1	8.8	No smoking during school hours
		2	3.4	No smoking during school hours
		3	4.2	No smoking during school hours
Ireland	No smoking in school buildings or on the premises	1	1.8	No smoking while in school uniform
		2	4.9	No smoking while in school uniform
		3	2.6	No smoking while in school uniform
		4	8.9	No smoking while in school uniform
Italy	No smoking in school buildings or on the premises	1	15.0	No smoking during school hours[c]
		2	26.5	No smoking during school hours
		3	10.8	Any student in a designated area on the premises
		4	44.6	No smoking during school hours
Netherlands	No smoking in school buildings, except in ventilated 'smoking rooms' (no prohibition against smoking on the premises)	1	6.6	3rd graders (avg. 14–15 yo) and above, outside the premises
		2	7.0	3rd graders (avg. 14–15 yo) and above, in a designated area on the premises
		3	21.5	3rd graders (avg. 14–15 yo) and above, outside the premises
		4	18.8	4th graders (avg. 15–16 yo) and above, in a designated area on the premises
Portugal	No smoking in school buildings or on the premises	1	17.6	10th graders (avg. 15–16 yo) and above, outside the premises
		2	11.5	10th graders (avg. 15–16 yo) and above, outside the premises
		3	10.4	10th graders (avg. 15–16 yo) and above, outside the premises

a. Questionnaires were completed by adolescents at school in the two grades enrolling students aged 14–16 years.
b. Detailed data on staff smoking bans in different schools is unavailable.
c. In Latina (Italy), most schools have comprehensive official rules, but their actual implementation is problematic. One school deliberately chose not to follow the law prohibiting smoking on school premises.

The semi-structured interview topic guide (Attachment 1) was formulated in collaboration with research teams from all SILNE-R countries. This ensured that the guide was fit for the different national and educational settings. The Finnish researchers, Pirjo Lindfors and I, coordinated the collaboration. I piloted the topic guide twice in Finland, which led to only minor changes. A joint face-to-face training session for researchers was organised to establish a common understanding of the study protocol. In each country, one to three junior researchers with experience in qualitative research conducted the interviews. I conducted the Finnish interviews.

Altogether, three or four interviews were conducted in each school between the end of 2016 and mid-2017. The interviewees represented varying professional positions, including senior managers, teachers and support staff (e.g., receptionists, caretakers, educators). See Attachment 2 for an overview of the interviewees, including their professional positions and age groups. The interviews lasted between approximately 20 and 60 minutes. All interviews were audio-recorded, transcribed verbatim, translated into English and sent to Finland for analysis. Three transcripts from two schools in Germany were excluded from the analysis, as we set the minimum number of transcripts per school at three. For Article III the interviews from Italy (n=12) were also excluded, as they did not provide sufficient data to answer the research questions. This led to the inclusion of 81 interviews in Article II and 69 interviews in Article III.

The interviews were analysed using thematic analysis, which is a method for developing and interpreting patterns across qualitative data sets (Braun & Clarke, 2006, 2022; Terry et al., 2017). The thematic analysis process includes systematic coding of the data to develop themes. The themes are defined as patterns of shared meanings, ideas or concepts in the data set. Themes represent the results of the analysis. Thematic analysis was an appropriate method to analyse the extensive (n=84) cross-country data and to meet the aims of the articles. Many other generally used qualitative analysis methods might have narrowed the analysis too much. For example, content analysis, with its relatively fine-grained style of coding from the very beginning (Sandelowski, 2000, 2010), might have lost some of the patterns of shared meanings or ideas in such a large data set.

One of the core features of thematic analysis is that the analysis is always underpinned by theoretical assumptions, which need to be reflected upon carefully (Braun & Clarke, 2022). The thematic analysis in this study was grounded in critical realism, the perception of schools as SCAS and the implementation concepts. It is possible to adapt thematic analysis to varying ontological approaches, and critical realism has often been used (Braun & Clarke, 2022). Critical realism guided the analysis to explain the causal pathways between policy and outcomes by considering the context and mechanisms (compare CMOs/causal explanations in realist methodology). Besides these theoretical and conceptual foundations, our analysis aimed to be as inductive as possible. The data-driven approach allowed us to gain a comprehensive understanding of the rich and nuanced cross-country data.

The analytical process was iterative for both Article II and Article III. To ensure a strong analysis, I worked in close collaboration with Michael Schreuders. Our collaboration provided a broad understanding of different country and educational settings, and assisted us to make deep, complex and compelling interpretations of the data. We (I alone in Article II, Schreuders and I together in Article III) first familiarised ourselves with the whole data set to gain a deep overall and context-specific understanding of the data. Two phenomena stood out from the whole data set: 1) staff's confidence as explaining their enforcement, which then became the

topic of Article II; 2) staff's tendency to abstain from enforcing with persistent rule violators, which became the topic of Article III.

In Article II, I then utilised NVivo to code all parts of the data that related to staff confidence, and I recoded this data set to analyse the contextual factors in staff confidence and the connections between confidence and enforcement. Then I looked for patterns in the codes, and finally I synthesised them into three themes that explained staff confidence in STP enforcement. These themes were compared with the initial data set on confidence to ensure consistency in the interpretations. The iterative analysis involved several discussions with Schreuders to reach a consensus on the interpretations. The final considerations were also reflected on and agreed by the other authors.

In Article III, Schreuders and I individually coded all cases where staff described ignoring rule violations by persistent violators, and any parts of the text that seemed relevant to understand the reasons for this. Schreuders and I then looked for patterns in the codes, and we repeatedly discussed the analysis together in order to refine it and find agreement on the themes. According to thematic analysis, good coding can be achieved alone or through collaboration (Braun & Clarke, 2022). When the coding is done in collaboration, the aim is to enhance understanding, interpretation and reflexivity, rather than to reach a consensus on the codes. Finally, in close collaboration with me, Schreuders contrasted, combined and selected the relevant themes to explain why staff might choose to ignore rule violations by persistent violators. The final steps also involved repeated discussions with the other co-authors to reach consensus on the final considerations.

5.5   Narrative review of tobacco policy implementation in the Nordic countries

Article IV is a narrative review of the implementation of preventive tobacco policies in the Nordic countries. In line with Greenhalgh et al. (2018), I define a narrative review as a summary that includes interpretation and critique. Although reviews and syntheses are sometimes treated as separate approaches (Mays et al., 2005), I consider them synonyms here insofar as Article IV is not only a summary but also produces new insights by identifying, extracting and synthesising data from several sources. Different review types serve different purposes, and narrative reviews have been often used to synthesise mixed sources of evidence – for instance, to inform policymaking (Mays et al., 2005). The narrative review provided the most suitable approach to achieve the aims of Article IV, as it allowed us to utilise different types of evidence – qualitative and quantitative, scientific and grey literature – in order to assess and compare policy implementation in the Nordic countries and to explain the underlying factors. Partly because of its flexibility, narrative review has also been criticised (Mays et al., 2005). Although the principles and procedures of narrative review differ from those of systematic review, this does not mean that narrative reviews are unsystematic; indeed, the latter can be conducted and presented in a systematic way (Greenhalgh et al., 2018). The comprehensive and systematic review process used for Article IV is described in detail in the article itself. Here I will briefly summarise the key data and the characteristics of the process.

We utilised scientific evidence regarding policy effectiveness and the behaviour change wheel (BCW) to select a comprehensive set of WHO FCTC policies as implementation objects. The BCW is an implementation theory summarising policy and intervention measures that

influence behaviour through motivations, capabilities and opportunities (Michie et al., 2014). This led us to focus on WHO FCTC Articles 6, 8, 9, 11, 13 and 16, which are grouped under the relevant BCW categories in Table 5 (see also Table 1 for descriptions of the policies). Under the selected policies, we categorised the measures required by the WHO FCTC as *core policies*, and the measures recommended by the WHO FCTC as *advanced policies* (see Attachment 3 for the indicators of core and advanced policies). The WHO FCTC applies to all tobacco products: cigarettes, RYO tobacco, pipe tobacco, water pipe tobacco and smokeless tobacco. As far as possible, we also assessed the application of the core and advanced policies to novel tobacco and nicotine products, such as e-cigarettes, HTPs and nicotine pouches.

Table 5. Preventive WHO FCTC policies grouped under behaviour change wheel (BCW) categories (modified from Article IV)

BCW category	Description of WHO FCTC policy
Regulation	Product regulations (WHO FCTC Article 9) Preventing product access by minors (WHO FCTC Article 16)
Communication and marketing	Packaging and labelling (WHO FCTC Article 11) Advertising, promotion and sponsorship (WHO FCTC Article 13)
Environmental/social planning	Smoke-free environments (WHO FCTC Article 8)
Fiscal measures	Price and tax measures (WHO FCTC Article 6)
Legislation	WHO FCTC Articles 6, 8, 9, 11, 13, 16

We searched the global tobacco control databases (WHO, 2021c; WHO FCTC, 2020) for information on strategies, acts and other regulations in the Nordic countries, as well as governmental online databases and websites, and the websites of non-industry-affiliated and non-governmental organisations (NGOs). This data was analysed and synthesised to develop an understanding of the regulatory scheme in each country. Additionally, to provide comparable estimates of the comprehensiveness of the implementation of the WHO FCTC measures, we utilised publicly available data from the WHO FCTC (2020) implementation database, and we counted the number of implemented policies or measures under the selected provisions for each country (see Figure 8 in Chapter 6). For WHO FCTC Article 8, we counted both complete and partial bans. We derived the tax measures for WHO FCTC Article 6 from the WHO (2021c) report on the global tobacco epidemic.

To develop our initial understanding of the primary determinants of policy implementation at the national, Nordic, European, and global levels, we utilised the WHO FCTC (WHO 2003) and the core determinants identified by Cairney (2012), which include context, institutions, networks, agenda-setting/framing, and diffusion/transfer of ideas. To further analyse how these and other factors might have influenced tobacco policy implementation in the Nordic countries, we searched for and analysed relevant grey literature via governmental and NGO websites, and scientific articles via PubMed and MEDLINE (language: English; timeline: 1990–2021), and we used snowballing techniques to identify clusters of evidence. The synthesis was

reviewed by health authorities in these countries and revised according to their feedback. However, the results are the sole responsibility of the authors.

5.6 Ethical considerations

Throughout the research process, I followed the Finnish Advisory Board on Research Integrity's (2012) guidelines for the responsible conduct of research. Both of the research projects connected to my thesis, SILNE-R and NADNIC, underwent ethical review and received ethical approval. The ethical approval for the NADNIC project did not explicitly concern my thesis, as approval was not needed to conduct the narrative literature review (Article IV). However, ethical approval for staff interviews as part of the SILNE-R project was critical to my thesis (Articles II and III). Ethical approval for the SILNE-R research was obtained separately for each city, to comply with national standards:

- Belgium: REF 2012/09OCT/461 N° enregistrement belge B403201215182 – Comité d'éthique Hospitalo-Facultaire des Cliniques Universitaires Saint-Luc.

- Germany: Ethical approval MLU Halle-Wittenberg: 2016-90 hm-bü. Supervisory school authority Hannover: H 1 R b – 81402 – 55 – 2016. Supervisory school authority Lüneburg (Celle): LG 1 R.22 – 503000.

- Portugal: General Directorate for Education, approval number 0338600002, 26 July 2016.

- The Netherlands: Medical Research Involving Human Subjects Act (WMO): reference number W16_252 # 16.297, 11 August 2016.

- Ireland: Research Ethics Committee – Dublin Institute of Technology: Ethical Clearance Ref. 15-105, 16 June 2016.

- Finland: Ethics Committee of the Tampere Region, Statement 29/2016.

School staff members were provided with information about the research and procedures (e.g., interview recordings) before signing a written informed consent form (Attachment 4) and participating in the interviews. The voluntary nature of their participation was stressed, as was their right to withdraw at any time or to refuse to allow the use of their data afterwards. In the transcripts, pseudonyms were used, and any information that would clearly identify participants was not included. The data and personal information were processed in accordance with national regulations, the EU's General Data Protection Regulation (2016/679) (EU, 2016) and guidelines for the responsible conduct of research (Finnish Advisory Board on Research Integrity, 2012). The data sets generated and analysed during the current study are not publicly available due to the qualitative data's highly sensitive nature.

Throughout the research process, I reflected on the potential impact of my own beliefs and experiences on the analysis. This type of reflection has been described as an internal dialogue (Stronach et al., 2007), and as an awareness of the self and the factors that influence one's

interpretations of the topic under study (Berger, 2015). These definitions of reflexivity, however, also challenge the idea that knowledge production is wholly independent of the researcher who produces it. In thematic analysis, the researcher's subjectivity is considered an important tool for the conduct of the analysis – a resource that helps researchers to actively produce themes and conduct strong analyses (Braun & Clarke, 2022). Knowledge generation is seen as inherently subjective and situated, and the complete control or elimination of researcher bias is not regarded as essential. Thus, my professional background as an upper secondary school subject teacher over many years, and my related knowledge of the education system, could be considered strengths that enabled me to conduct a strong school-level analysis. At the same time, it was important throughout the analysis to ensure that my experiences and understandings of the Finnish educational system did not influence my interpretations too much, as I did not have practical experience of the other countries' educational systems. Overall, my close collaboration with another researcher (Schreuders) supported me to conduct deep and nuanced analyses of staff interviews.

6 RESULTS

6.1 Staff members' enforcement of school tobacco policies

My school-level results are based on Articles I–III, which all explain staff enforcement of STPs. The programme theory produced in Article I provided a basis for explaining school staff members' STP enforcement. Articles II and III complemented this understanding by focusing on staff's confidence about STPs enforcement (Article II) and the challenges staff encountered with vulnerable students who persistently violated STPs (Article III).

6.1.1 Staff responsibility, motivation and confidence (Article I)

In Article I, we identified three mechanisms (M) that explained the variation in staff members' STP enforcement (O): *responsibility*, *motivation* and *confidence*. The emergence of these mechanisms was triggered by the interconnections between STPs and specific *contextual factors* in the individual, interpersonal, school, implementation and national layers (C). The programme theory in Figure 6 summarises the results.

CMO1: When the context allowed staff to experience STPs as part of their professional role and duties, this could lead to staff feeling responsibility for STP enforcement. National legislation banning smoking in schools and other public places supported staff to experience responsibility for STP enforcement. This was due to the mandatory nature of the law, but also because the legislation had contributed to denormalising smoking. Staff's sense of responsibility was supported if they perceived health promotion as part of their professional identity and values. However, some staff considered only educational tasks to be part of their duties. Furthermore, smoking was not always the main health challenge among students, and staff also had heavy workloads, which reduced staff's sense of responsibility for STP enforcement. Senior management had an important role in outlining the school's values with regard to health promotion and directing enforcement. Staff-student relationships were important to staff. In cases where intervening in students' STP violations would conflict with the staff's desired relationships with students, the staff often prioritised good relationships over enforcement. If staff felt their own smoking had an impact on young people's behaviour, they often perceived abstinence from smoking as a professional duty.

CMO2: When the context allowed staff to perceive that their contribution led to positive outcomes, this could lead to staff's motivation to enforce STPs. The STPs' effectiveness supported the staff's motivation to enforce them. For instance, staff members' motivation was affected by their perceptions of whether the school could compensate for the impact on adolescent smoking of peers, parents and social norms. Pupil characteristics also played a role. For instance, among addicted students, enforcement was often perceived as 'firefighting' rather than as having a real impact on smoking behaviour. Colleagues' behaviour also affected staff motivation. When they saw other staff members ignoring STP violations, their expectations of the impact of STPs and thus their motivation decreased. All staff participation was considered to be critical in normalising

a tobacco-free school. STPs also had negative consequences that reduced staff's motivation to enforce the rules. The relocation of smoking from hidden places to more visible places, such as just outside school grounds, and staff's limited power to ban or intervene smoking outside school grounds were frequently reported negative consequences.

CMO3: When the context allowed staff to feel they could deal with students' responses, this could lead to staff having the confidence to enforce STPs. Legislation banning smoking in schools and other public places laid a solid foundation for STPs by reducing negative reactions from students and increasing staff's confidence about enforcement. On the other hand, staff members' smoking undermined this by allowing students to question the staff's authority for enforcement. Staff also experienced a lack of confidence when students were unfamiliar to them, or when students' characteristics led staff to expect strong negative reactions or dismissive behaviour. Overall, there was limited empirical evidence to show which contextual factors were important or how they influenced staff's confidence about STP enforcement.

Figure 6. Programme theory explaining how contextual factors may trigger staff's sense of responsibility, motivation and confidence to enforce school tobacco policies (STPs) (Article I)

	Factors at different contextual levels	Mechanism	Outcome
CMO1	• Individual Staff's professional identity and values, e.g. health promotion vs academic education	Staff experience STPs part of the school staff's professional role and duties	Responsibility for STP enforcement
	• Interpersonal Staff's perceptions on the influence of enforcement to staff-student relationships		
	• School Existing workload and the significance of tobacco issue in school		
	• Implementation components Anchoring and communicating STP, including staff abstinence from smoking during school hours, as part of the school's core tasks and all staff's role and duties through written policies and senior management's engagement; come up with enforcement practices that do not threaten staff-student relationships		
	• National Legislation on STP and on tobacco in wider environment, e.g. ban on smoking in public places		
CMO2	• Individual Staff's perceptions on schools general ability to influence student smoking Student's characteristics (e.g. nicotine addiction)	Staff perceive that their contribution is leading to positive outcomes	Motivation for STP enforcement
	• Interpersonal Other staff members' participation to the enforcement		
	• Implementation components Coming up with strategies to tackle enforcement problems (e.g. smoking relocation that increase visibility, non-effective enforcement practices for students with nicotine addiction) e.g. to avert inconsistent enforcement among staff, communicating staff about the progress achieved with STP		
	• National Conformity in tobacco norms and aims between school and wider society (i.e. back up for STP)		
CMO3	• Individual Staff member's own smoking status Student's characteristics (e.g. physical or verbal aggression)	Staff feel that they are able to deal with students' responses	Confidence for STP enforcement
	• Interpersonal Staff's familiarity with the student		
	• Implementation components Communicating all staff's authority for STP enforcement and strengthening staff members' skills to enforce with difficult or unfamiliar students		
	• National Legislation on STP and on tobacco in wider environment, e.g. ban on smoking in public places		

6.1.2 Facilitating conditions for staff confidence (Article II)

Article I concluded that there was limited empirical evidence to show which factors were important for staff's confidence about STP enforcement. In Article II, we responded to this by analysing the conditions under which staff felt confident to address students who violated STPs. The results showed that when students' rule violations were addressed, the students often reacted negatively – for example, by complaining, questioning, ignoring instructions or otherwise being rude – which made enforcement challenging. This phenomenon was characteristic of the enforcement not only of STPs but of all school rules, such as bans on using mobile phones, wearing hats in class or littering. When staff members were confident about their own ability to prevent or cope with students' negative reactions, they were more likely to intervene in students' STP violations; when staff were uncertain, they were more likely to ignore violations. We found three conditions (compare to context/CMOs) that facilitated staff's confidence: *legitimacy*, *constructive interaction* and *collegial support*. These conditions especially supported STP enforcement among the members of staff who generally felt less confident to address students about rule violations, but they also supported all staff to enforce STPs, specifically with students who tended to respond strongly (i.e., 'persistent misbehavers'). The findings are summarised in Figure 7.

Figure 7. Facilitating conditions for staff's confidence to enforce school tobacco policies (STPs), structured in line with schools as social complex adaptive systems (SCAS) (Article II)
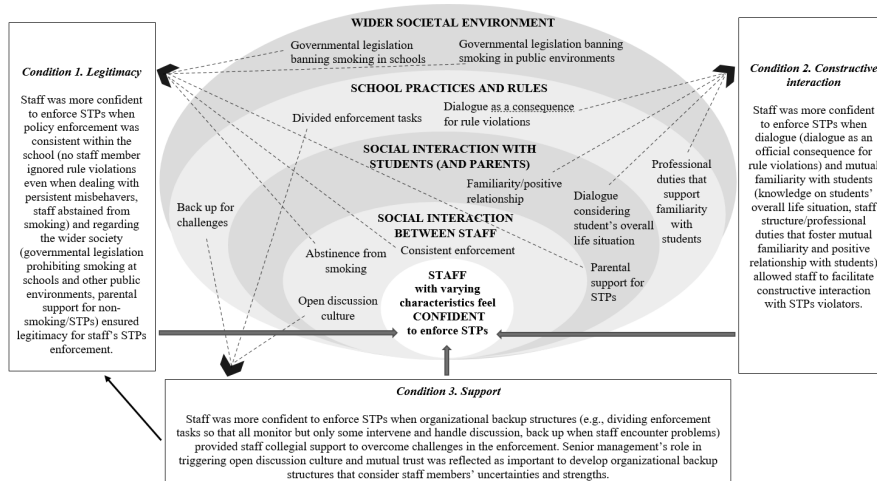
Condition 1: Staff were more confident to enforce STPs when consistency in policy enforcement, both within the school and regarding wider society, ensured staff legitimacy for STP enforcement. Governmental legislation set the minimum requirements for STPs, and most schools banned smoking on indoor and outdoor school premises (see Table 4). Legislation supported staff's legitimacy for enforcement and provided argumentation for their discussions. Comprehensive smoking bans in public places supported students' acceptance of STPs, while negative responses were more common if the school environment was more restrictive. Consistent enforcement of the rules by all staff, meaning that no one ignored STP violations, was critical to staff's legitimacy to enforce the rules. When some staff members ignored rule violations, this allowed students to

question the enforcement. In particular, 'persistent misbehavers' were prone to use such inconsistency to challenge the rules. Staff members' abstinence from smoking was also important to ensure their legitimacy. Since parental approval for smoking increased students' resistance to enforcement, parental involvement was important for dealing with rule violations.

Condition 2: Staff were more confident to enforce STPs when mutual familiarity and dialogue allowed them to build up constructive interactions with students during the enforcement. When staff intervened in rule violations, they preferred to build dialogue with students rather than impose punishments such as detention. Dialogue was perceived to engage young people in constructive interactions. A positive relationship or certain familiarity with the students allowed staff to anticipate students' reactions and reduce any negative reactions by tailoring the dialogue to each student's overall life situation. Conversely, staff found it challenging to intervene in unfamiliar students' rule violations. Familiarity also influenced the students' responses, as students were more likely to comply with staff members with whom they were familiar and whom they knew to be strict.

Condition 3: Staff were more confident to enforce STPs when organisational back-up structures provided them with collegial support to overcome challenges in enforcement. Collegial support was seen as particularly important for members of staff who were generally more uncertain about intervening in students' misbehaviour. Some schools had taken account of individual staff members' uncertainties by dividing enforcement tasks according to individual colleagues' different characteristics: all staff members were involved in monitoring and reporting rule violations, but discussion with pupils was allocated to the staff with the most authority (e.g., headteacher, heads of department) or the most appropriate skills (e.g., long professional experience) to deal with students' negative reactions. This was to prevent more insecure staff from ignoring STP violations in challenging situations. However, even when it was indicated that all staff members should address students regarding rule violations, it was common for challenging cases, such as students who repeatedly violated the rules or exhibited notably rude behaviour, to be directed to specific staff members – mainly headteacher. This organisational back-up structure ensured that staff were not left alone with challenges, and this encouraged them to enforce the rules even when they expected strong responses from the students. Overall, headteacher was reported to play a critical role in building mutual trust and open discussion among staff – a prerequisite for considering individual staff members' uncertainties.

6.1.3   Why staff ignore persistent rule violations (Article III)

The results in Article III showed that STP enforcement with vulnerable students who persistently violated STPs (i.e., students continued to violate STPs even after repeated warnings and/or disciplinary measures) was challenging, as staff had to balance between various interests. Sometimes this balancing act resulted in shared decisions among staff to ignore rule violations with students who continued to violate STPs despite the staff's preventive efforts. The staff reasoned that ignoring such violations had little impact on the students' non-smoking peers – for example, because these students smoked out of the sight of others. Our results identified three considerations (compare to mechanisms/CMOs) that explained why staff abstained from intervening in STP violations with some persistent rule violators.

Consideration 1: Staff believed their primary role and duty was to support all adolescents to develop into well-functioning adults, and sometimes it was best to accept smoking. Staff noted that national tobacco control had tightened over time and promoted social norms against smoking. This had led to

a significant reduction in the number of young people smoking in school, but it had also created a marginalised group that had not kept pace with social change. The students who persistently violated STPs were predominantly the most vulnerable young people. They tended to come from families with lower socio-economic backgrounds and to face a range of challenges (e.g., smoking addiction, poor school performance). Staff were reluctant to apply stricter disciplinary measures to these students because they believed this might interfere with the school's core responsibility to support young people's academic development. The staff stated that it was necessary to consider the lower priority of smoking compared with the young person's overall situation when enforcing STPs. However, this more lenient approach did not mean that vulnerable students could do whatever they wanted. They were only treated as exceptions if they were unable to follow the rules – for example, because of addiction – but still displayed good intentions, such as by smoking away from other students. They were not treated as exceptions when they simply did not want to follow the rules and responded strongly when addressed (i.e., when they were the 'persistent misbehavers' identified in Article II).

Consideration 2: Staff expected that the application of stricter disciplinary measures would not stop persistent violators and was likely to create more severe problems. Staff argued that STPs could be effective in preventing and reducing smoking among most young people but were generally insufficient to change the smoking behaviour of persistent STPs violators. They also reasoned that persistent violators found ways to circumvent staff enforcement, which in turn created new problems (e.g., staff would lose sight of the adolescents' whereabouts). Even when these violators were caught breaking the rules, the application of stricter disciplinary measures (such as detention) was perceived to lead to tension between staff and students rather than to prevent students from breaking the rules in the future. Therefore, the staff did not want to apply stricter disciplinary measures to these students; instead, they decided to continue a dialogue and maintain a positive relationship, which was considered important to support the students' academic development and overall well-being.

Consideration 3: Staff did not feel supported by relevant actors in society (e.g., parents) to influence adolescent smoking. Staff argued that policies and society placed increasing demands on schools, and that schools did not have all the necessary means or influence to meet those demands. The staff argued that one could not expect problems (e.g., smoking) that were developed and sustained by wider society to be tackled primarily by schools, especially if there was insufficient support from other actors in society (e.g., parents, policymakers, health services). Staff identified two key causes of adolescent smoking over which schools had little or no influence. First, young people might live in social environments where smoking was normal and where they had developed nicotine dependence. Staff across countries contemplated possible means to target this issue, such as the provision of smoking cessation support, but effective strategies had not yet been identified. Second, parents who did not support STPs or who accepted their children's smoking undermined school rules and efforts. The need to improve parental involvement was widely discussed, but the general experience was that the parents schools were most desperate to involve were the least receptive to school initiatives.

6.1.4 Refined mechanisms: Responsibility, motivation and confidence

Article I demonstrated that three mechanisms – *responsibility*, *motivation* and *confidence* – triggered by specific contextual factors explained staff's STP enforcement (CMOs). The empirical evidence in Articles II and III allowed us to refine these causal pathways, for instance, to take better account of uncertain staff members and vulnerable students who persistently violated STPs.

Refined responsibility: Staff felt responsible for STP enforcement when contextual factors (e.g., their professional identity and values, the students' characteristics) led them to perceive health promotion as part of their professional role and duties, and not as preventing them from supporting students' academic development and overall well-being. Article I showed that staff were more likely to experience STP enforcement as their responsibility if they perceived health promotion as part of their professional role. Article III added that most of the students who did not follow the societal trend towards smoking denormalisation and instead continued to violate STPs often faced many challenges in life. In this bundle, smoking was often not the most urgent issue. With these vulnerable students, staff's health promotion duties were often in conflict with their educational duties. Staff argued that when a student faced many challenges, academic goals – including good staff-student relations – had to be prioritised over health promotion.

Refined motivation: Staff experienced motivation to enforce STPs when contextual factors (e.g., the perception that school disciplinary measures and enforcement were effective, and enforcement did not jeopardise staff-student relationships) led them to expect that their contribution would lead to positive outcomes and that those positive outcomes considerably outweighed the possible negative outcomes. Article I showed that with addicted students, STP enforcement was often regarded as 'firefighting' rather than as having a real impact on smoking behaviour. In Article III, staff stated that schools did not have the real means to support nicotine-dependent adolescents, and thus these staff members did not expect that intervening in violations would encourage addicted students to stop smoking or prevent them from breaking the STPs in future. Staff noted overall that schools could not override parental or societal influences or tackle the challenge of smoking when it was being developed and maintained elsewhere. Thus, instead of placing increasing demands on schools, society needed to provide schools with more support (e.g., from parents, tobacco control, health services) to reach these students.

Refined confidence: Staff felt confident to enforce STPs when contextual factors (legitimacy, constructive interaction, collegial support) led them to feel they could prevent, diminish and handle students' negative responses. Article III explained that students were treated as exceptions (i.e., not subjected to increasing disciplinary measures) only if they were unable to comply with STPs but showed good intentions, and not if they simply did not want to comply and responded strongly (i.e., 'persistent misbehavers'). Article II explained that staff's confidence was especially needed when they were enforcing STPs with persistent misbehavers. Collegial support (e.g., dividing enforcement tasks, providing back-up for challenges) facilitated all staff members' confidence to enforce the rules with these students, but it was especially important for the more uncertain staff members. Dividing enforcement tasks encouraged all staff members to at least monitor and report STP violations, thereby ensuring that rule violations were not ignored and that enforcement remained consistent. This consistency was important with persistent misbehavers, as they were prone to utilise inconsistency to their advantage.

6.2 Tobacco legislation and regulations in the Nordic countries (Article IV)

The school-level findings demonstrated that national tobacco control, such as regulations on smoke-free environments (WHO FCTC Article 8) and other preventive tobacco policies (Articles 6, 9, 11, 13 and 16), influenced the enforcement of STPs by triggering or undermining staff's sense of responsibility, motivation and confidence regarding STP enforcement. For instance, national legislation compelling smoke-free school premises (WHO FCTC Article 8) supported staff's legitimacy for enforcement (i.e., confidence). Therefore, in Article IV, we studied the comprehensiveness of preventive tobacco policies in the Nordic countries, the application of those regulation to smokeless and novel tobacco and nicotine products, and the contextual factors that influenced policy implementation.

6.2.1 Policy strengths and weaknesses across the countries

Strengths and weaknesses in the implementation of core and advanced policies: The shared strengths in the Nordic countries' policy implementation relate to the *core policies* required by the WHO FCTC. These have largely been integrated into national legislation and regulations in all countries, including the 18-year age limit for tobacco sales, smoking bans in indoor public places, comprehensive bans on TAPS, and warning labels on cigarette packages. However, there are also deficiencies regarding the *core policies*: Although all the Nordic countries have implemented tax policies on tobacco products, by 2021 only Finland and Denmark had met the WHO recommendation of a minimum 75% tax share of the retail price of tobacco. Moreover, Sweden, Iceland and Denmark do not report that their TAPS bans extend to the global Internet. The Nordic countries were also among the first in the world to implement the *advanced policies* recommended but not required by the WHO FCTC: point-of-sale display bans (Iceland); outdoor smoking bans (Sweden); flavour bans on e-cigarettes (Finland); plain packaging of cigarettes, RYO tobacco and snus (Norway); and plain packaging of e-cigarettes (Denmark). However, the implementation of *advanced policies* is generally inconsistent and lacking across the countries.

Comprehensiveness of the core and advanced policies: If we compare countries based on the number of reported core and advanced measures in early 2020 (Figure 8), none of the Nordic countries stand out from any of the others as clearly having more comprehensive tobacco policies, but they all have different strengths and deficiencies. The implementation of smoke-free environments (WHO FCTC Article 8), for instance, is inconsistent between the countries. Smoking bans are the most comprehensively implemented in Norway (15 complete bans), whereas Finland (two complete and 14 partial bans), Sweden (three complete and 12 partial bans) and Denmark (four complete and 11 partial bans) could strengthen their implementation by implementing complete instead of partial bans.

Figure 8. Comparisons of the comprehensiveness of core and advanced WHO FCTC preventive policies in the Nordic countries. The horizontal dashed line indicates the maximum number of measures counted under the Articles (WHO FCTC Articles 8, 9, 11, 13, 16) or the recommended minimum level of implementation (WHO FCTC Article 6) (Article IV)
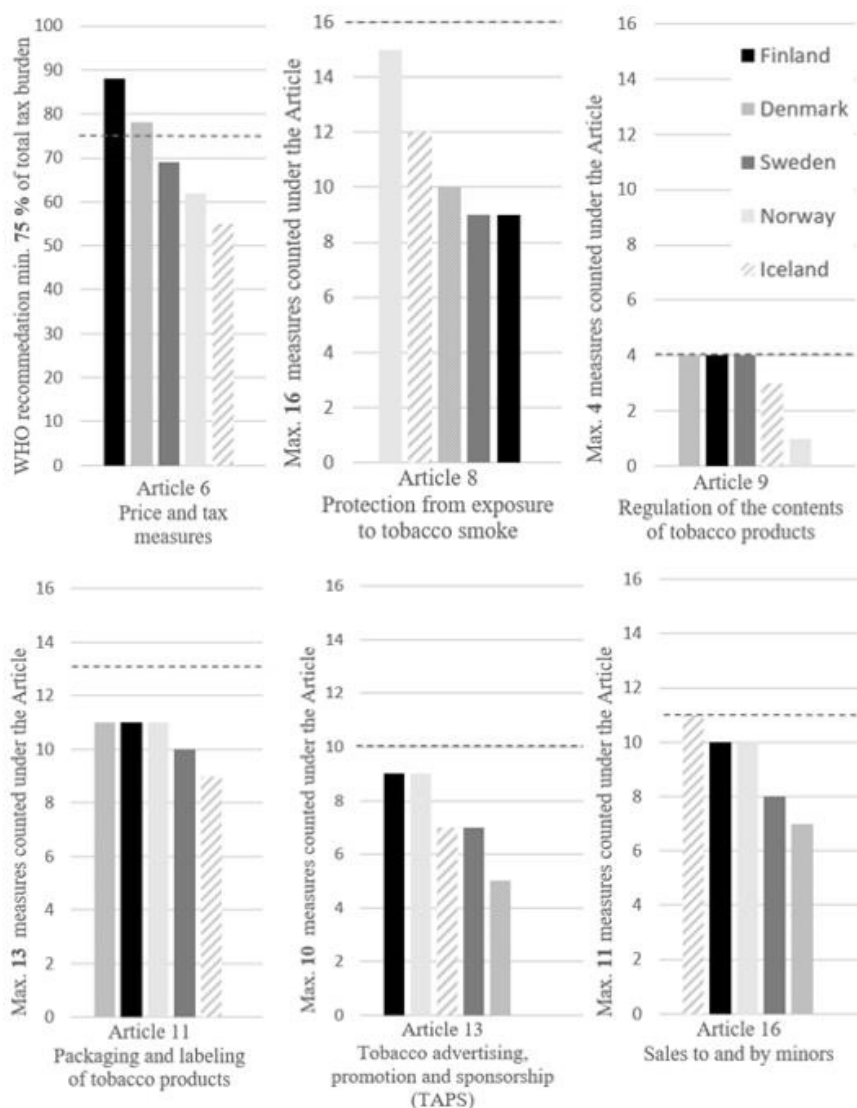
Implementation of smoke-free environments (WHO FCTC Article 8): As smoke-free environments are the core policy addressed in this study, I will explicate their implementation in more detail. Tobacco- and nicotine-free school hours have been implemented in Denmark and Norway, indicating the prohibition of tobacco and nicotine use during school hours regardless of where students are. Other Nordic countries have extended the ban on tobacco and nicotine use from indoor to outdoor school premises, and in Finland many schools also prohibit students from leaving school premises during the school day. Sweden is the only Nordic country that does

not ban the use of smokeless tobacco products inside educational facilities or prohibit smoking rooms for school staff.

All countries prohibit smoking in indoor public places, in workplaces and on public transport, but all countries except Norway permit smoking rooms under certain conditions, and these exceptions are the most common in Denmark. Sweden is the most progressive in implementing comprehensive smoking bans in outdoor public places, such as on the terraces of cafés and restaurants and in the outdoor areas of public transport facilities. Norway and Finland also implement some outdoor smoking bans. In Norway, smoking is prohibited outside the entrances of health institutions and public buildings; in Finland, smoking is prohibited in public playgrounds, on beaches and in audience areas at public events.

The countries differ with regard to whether their smoking bans also apply to smokeless and novel products. All countries generally ban vaping in the same indoor areas as smoking. Smoking bans are generally not extended to the use of smokeless tobacco in public places. In Finland, snus was included in the latest amendment, which extended outdoor smoking bans to public playgrounds. HTPs are sold in Sweden and Denmark, and Sweden applies smoking bans to these products, but Denmark is currently in the process of deciding which provisions to apply to HTPs. HTPs are not sold in Finland, but smoking bans nonetheless extend to these products.

Application to smokeless and novel products: The Nordic countries' regulations on smokeless tobacco and novel tobacco and nicotine products, such as e-cigarettes, HTPs and nicotine pouches, are inconsistent and lacking. Countries differ with regard to the products sold on their national markets and the regulation of those products. Generally, core policies – such as the age limit for sales, and health warnings in packages – extend to all products except nicotine pouches, but advanced policies such as flavour bans are less common. The absence of prohibitions on appealing flavours in smokeless tobacco and nicotine pouches is one of the key regulatory deficiencies across the Nordic countries. Other important deficiencies relate to the lack of pictorial warnings or plain packaging.

Norway is the most active in prohibiting novel products such as e-cigarettes and nicotine pouches from entering its national market; however, Norway sells snus, albeit subject to stricter regulations compared with Sweden, where snus is also sold. Finland bans smokeless tobacco products from its national market. HTPs are not sold but still subject to regulations. The sale of nicotine pouches requires a medical sales permit. Finland is also active in imposing strict regulations on e-cigarettes. Denmark's tobacco control has lagged behind the other countries', and its national market has quite a wide variety of products overall, including e-cigarettes, HTPs and smokeless tobacco (i.e., chewing tobacco and nasal tobacco). However, Denmark has recently made considerable improvements in its tobacco control (e.g., tax increases), including in the regulation of novel products (e.g., a ban on appealing flavours in e-cigarettes, and a tax on nicotine pouches).

Despite Iceland's rather strong history of tobacco control, it was the last Nordic country to adopt any national legislation on e-cigarettes, doing so only in 2018 (the legislation came into force in 2019). In Iceland, the sale of nicotine pouches is unregulated, and smokeless tobacco (i.e., nasal tobacco, also used orally) is also sold. Among the other Nordic countries, Sweden's national market has the most smokeless and novel tobacco products such as snus, e-cigarettes, HTPs and nicotine pouches, and Sweden's regulations are altogether weaker compared with the other countries. Swedish NGOs have recently expressed concern about the country's stalled progress on tobacco prevention.

6.2.2   Contextual factors influencing policy implementation

European and global regulations: All the Nordic countries are members of the WHO FCTC, which directs and guides policy implementation. As members of the EU, Finland, Denmark and Sweden are obliged to transpose the Tobacco Products Directive (2014/40/EU) (TPD), the Tobacco Taxation Directive (2011/64/EU) (TTD) and the Tobacco Advertising Directive (2003/33/EC) (TAD) into their national legislation. As members of the European Economic Area, Iceland and Norway are obliged to implement all relevant EU directives, including most of the tobacco directives, but not the TTD. For instance, due to the TPD, all countries are required to place health warnings on cigarette packages. However, the TPD has not harmonised all national regulations: for example, Sweden (on its accession to the EU) and Norway (on its accession to the European Economic Area) negotiated exemptions on smokeless tobacco sales. The countries' varying regulations about novel tobacco and nicotine products can mainly be explained by the deficiencies of the TPD and the WHO FCTC. The TPD has also had negative consequences: for instance, Finland and Norway had to open their national markets to nicotine-containing e-cigarettes after implementing the TPD. Ineffective EU-level standards on tobacco taxation (i.e., the TTD) partly explain the low tobacco taxes in many Nordic countries. The TAD's focus on traditional channels also partly explains countries' varying regulations regarding advertising and promotion on the Internet and social media.

National objectives, strategies and legislation for tobacco control: The Nordic countries demonstrate different histories of tobacco legislation, and they vary in their current objectives and strategies for tobacco prevention. In 2010, Finland became the first country in the world to integrate the tobacco endgame objective into its legislation. In 2016, this goal was extended to cover all non-medicinal nicotine products, the target use level was adjusted from 2% to 5%, and the target date was brought forwards to 2030. The other Nordic countries have not officially decided on the tobacco endgame objective, but in 2013 the Norwegian Tobacco Control Act was amended to include the goal of a tobacco-free society. By comparison, Iceland does not have an official tobacco control objective or strategy, although it has successfully implemented the Icelandic prevention model, which also targets smoking prevention.

Health ministries and research institutions: Ministries of health play the leading role in tobacco control in the Nordic countries. The health ministries' resources and commitment (which is especially strong in Norway, Finland and Iceland) has facilitated the Nordic countries to implement rather comprehensive tobacco prevention compared with many other European countries, and also to implement some of the *advanced policies* – in some cases being the first countries in the world to do so. For example, the WHO has recognised the Finnish Ministry of Social Affairs and Health for its long-term commitment to tobacco control and its exemplary action to protect young people from tobacco and nicotine, especially e-cigarettes. Denmark's relatively weak history of tobacco control can be partly explained by the fact that strong political commitment has only arisen in recent years.

In many Nordic countries, the health ministries' strength has been backed up by the establishment of tobacco control units. These tobacco control units, such as the Norwegian Institute of Public Health, have guided policy implementation by producing knowledge about the effectiveness and feasibility of tobacco policies. The financial resources available for national tobacco control vary from country to country, with inadequate resources highlighted as undermining sustainable progress (e.g., Finland's ability to achieve the tobacco endgame goal by 2030). None of the Nordic countries have earmarked a percentage of tobacco taxation

income to funding any national plan or strategy for tobacco control, although Iceland has earmarked 0.9% of the revenue from all tobacco sold to control and prevention.

Civil society: Civil society is actively involved in shaping tobacco prevention in many Nordic countries by developing policies and building horizontal collaborations. Strong NGOs (especially in Sweden, Finland and Denmark) are often associated with governmental funding. Intersectoral collaboration within the Tobacco-Free Finland network led by ASH Finland partly explains Finland's positive tobacco progress, especially over the last decade.

Public opinion: Supportive public opinion has given countries the opportunity to implement stronger tobacco control, and it also puts pressure on policymakers to move forwards. In Denmark, for example, the increase in young people's smoking has generated widespread public pressure for political action, which has led to a comprehensive strategy and improvements in tobacco control (e.g., tax increases). Although smokers generally have more negative opinions about stricter tobacco control, the majority – regardless of smoking status – seem to be in favour of preventing youth tobacco and nicotine use. With respect to this, tobacco policies are often framed to protect future generations from the harms of tobacco and nicotine (i.e., the 'child frame').

Interference by the tobacco industry: The tobacco industry is influential in all the Nordic countries, but its presence seems to be the most significant in the countries that have their own tobacco manufacturing: Denmark and Sweden. The tobacco and snus industry has sought to prevent and delay the implementation of stricter tobacco control by influencing the public and decision makers at local, national and European levels. For instance, the industry succeeded in delaying the implementation of smoke-free laws and health warnings on tobacco packages. National tobacco control actors and their networking are key to gain power over the tobacco industry at the national level. European regulations and the WHO FCTC also provide protection for the implementation of new policies. WHO FCTC Article 5.3 requires parties to protect their public health policies from the commercial and other vested interests of the tobacco industry, although yet only Norway has a national strategy in harmony with this article.

Nordic countries' impact on each other: The Nordic countries' different strengths and deficiencies in policy implementation provide a good basis for knowledge-sharing and policy diffusion from one country to another. For example, Iceland was the first country in the world to introduce a display ban in 2001, and when Finland and Norway also adopted this policy in 2010, they referred to Iceland as one of the countries that had already implemented the ban. Other countries' demonstrably stricter tobacco policies also put pressure on national policymaking. On the other hand, more lenient regulations and the greater availability of tobacco products on other countries' national markets also weaken prevention in countries that have stricter supply and demand reduction policies. For instance, it is common for Swedish snus to be imported to neighbouring countries that have sales bans or impose higher prices on smokeless tobacco products.

7 DISCUSSION AND CONCLUSIONS

7.1 Interpretations and recommendations to strengthen policy implementation

In this thesis, I have analysed the implementation of preventive tobacco policies at school and national levels. I have explained how context interact with the policies and influence their implementation via specific mechanisms. Article I demonstrated how three mechanisms – namely *responsibility*, *motivation* and *confidence* – that are triggered by specific contextual factors explain staff's STP enforcement. The empirical evidence in Articles II and III helped me to refine these causal pathways to take better account of uncertain staff members and vulnerable students. Article IV extended the analysis to the national level and explained how contextual factors may influence the implementation of preventive tobacco policies into national legislation and regulations as well as their application to smokeless and novel tobacco and nicotine products.

The results are synthesised in a programme theory (Figure 9) that outlines the causal pathways at both national and school organisational levels. The programme theory shows how contextual factors at the national, European and global layers and between neighbouring countries trigger mechanisms that may support the implementation of global tobacco policies (WHO FCTC Articles 6, 8, 9, 11, 13 and 16) into national legislation and regulations. The programme theory also illustrates how different contextual factors at individual, social, organisational and societal layers trigger mechanisms that may support the consistent enforcement of STPs (WHO FCTC Article 8). As illustrated in the figure, the national-level outcome influences the school-level enforcement in two ways: Firstly, it provides the policy to be implemented and enforced at schools. Secondly, it influences school level enforcement by shaping the societal context. Overall, the programme theory demonstrates that the existence of global tobacco policies does not automatically lead to those policies being comprehensively implemented and enforced; rather, interactions between policies and contexts, and within contextual factors in various layers, ultimately shape implementation. Sometimes implementation also needs to be adapted to avoid unintended negative consequences, such as negative impacts on implementers or the target group. The programme theory helps us to identify ways to support policy implementation towards a tobacco endgame by strengthening policies and contextual factors at various levels.

Figure 9. Causal pathways for tobacco policy implementation at national and school organisational levels
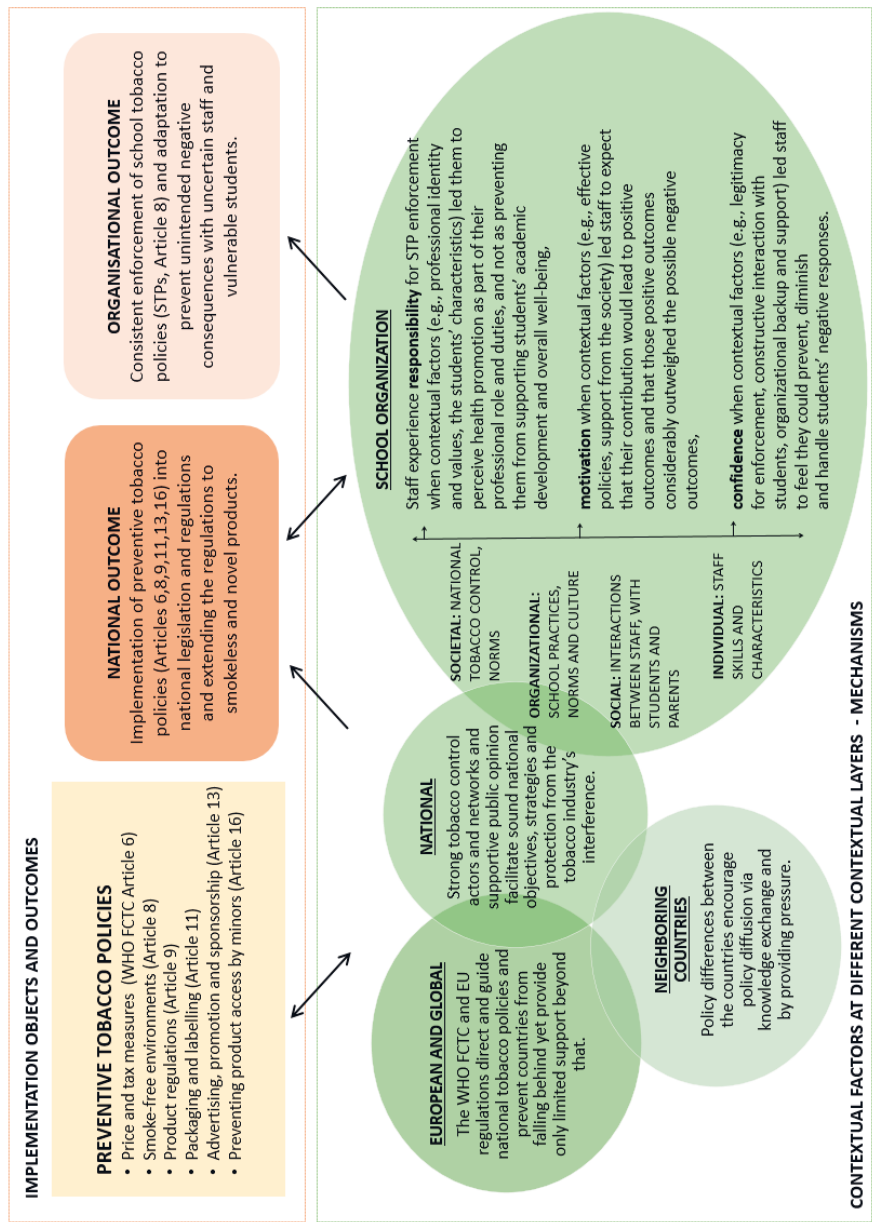
7.1.1 Colleagues' behaviour, vulnerable students and tobacco control

Aligning with schools as SCAS (Keshavarz et al., 2010), the results demonstrate that the enforcement of STPs by staff with varying characteristics emerges in interactions with other staff members, students, organisational practices and the broader tobacco control environment. Other staff members' enforcement played a significant role in explaining individual staff members' STP enforcement. Staff's consistent STP enforcement legitimised staff's authority to enforce STPs and minimised students' opportunities to question that authority, which supported staff confidence. Other staff members' participation in enforcement also supported their motivation for STP enforcement by increasing positive outcome expectations. Staff's consistent enforcement also formed interconnections between the mechanisms: staff's sense of responsibility facilitated the consistency of all staff members in enforcing STPs, which in turn supported staff motivation and confidence. As can be deduced from the above, staff's consistent STP enforcement was not only an outcome of the mechanisms, but also worked as a context that triggered the mechanisms. Previous STP studies have not explicitly considered interactions between staff members, although such interactions may explain some of the reported inconsistency in enforcement (Galanti et al., 2014; Gordon & Turner, 2003; Rozema, Mathijssen et al., 2018).

Colleagues also offered a way to overcome implementation challenges caused by individual-level factors. A key enforcement challenge reported by staff, both in this study and in others (Kvillemo et al., 2021), was conflict with students. In order to address students, staff therefore needed to feel confident about their own skills to carry out constructive dialogue. Overall, dialogue was considered the most appropriate way to deal with student misbehaviour. This is in line with current notions of pedagogical authority as characterised by genuine interaction and mutual trust between teachers and students, and as clearly distinguished from the authoritarian use of power (Harjunen, 2002, 2009, 2011). The challenge here, however, was that not all staff had the same characteristics, skills or comfort with regard to conducting dialogue with rule violators. Staff's skills can be supported by training (CASEL, n.d.; Waller et al., 2017), but our results showed that utilising the social context and distributing enforcement duties might provide more feasible ways to address these individual-level barriers to enforcement and to ensure consistent enforcement.

Differentiating enforcement duties according to individual skills, characteristics and strengths prevented uncertain staff from ignoring rule violations and ensured that STP enforcement was as consistent as possible in real-life circumstances. In practice, this meant that all staff monitored and reported STP violations, but the staff with the most suitable characteristics (e.g., long professional experience) or the most jurisdiction (e.g., headteacher) carried out the dialogues with rule violators. Thus, our results suggest that instead of focusing on individual staff members' abilities one by one, it might be more beneficial to strengthen organisational practices that support staff's collective ability to enforce STPs consistently. This resonates with understandings of collective efficacy. Collective efficacy refers to an individual's expectation that a group can act effectively together (Bandura, 2000), and it has been shown to explain individuals' behaviour regardless of whether self-efficacy is achieved individually or collectively (Bandura, 2000; Donohoo, 2018; Hoogsteen, 2021; Sørlie & Torsheim, 2011).

Our results found that schools were linked to their societal context. For instance, the importance of legislation that backs up STPs is often reported in studies (Hjort et al., 2021; Rozema et al., 2016), and the school staff in our study also considered this to be important. Legislation supported staff's

sense of responsibility and confidence about enforcement. In addition, national tobacco policies defined the phenomena that schools were facing. Increasingly strict tobacco control had decreased the numbers of students that staff saw smoking and violating STPs, but staff also stated that smoking among the remaining group was often beyond the school's reach. Promoting health and supporting school performance are generally seen to go hand in hand (Langford et al., 2014), and staff largely felt responsible for carrying out health promotion agendas and tasks as part of their duties. However, with vulnerable students, staff often experienced STP enforcement as contradicting their core professional role and duty, which was to support students' academic development and overall well-being.

Therefore, in addition to ensuring that national policies stipulate health promotion as part of school duties (e.g., in Finland, the Basic Education Act and the Act on Student Welfare and Health Services), it is also necessary to ensure that schools have the necessary resources and means to support vulnerable students' health and health-promoting behaviour. One way to facilitate this might be to strengthen the horizontal collaboration between the education and health sectors in order to provide comprehensive health services, including smoking cessation support for students. Currently schools' smoking cessation support seems to be somewhat ineffective or lacking (Mertens et al., 2021), even though its necessity for STP implementation has been stressed (Hjort et al., 2022; Schreuders, van den Putte et al., 2020). However, the provision of cessation support does not necessarily level out the socio-economic differences in smoking (Bosdriesz et al., 2015; Brown et al., 2014; Hill et al., 2014; Hiscock et al., 2011; Pisinger et al., 2022). Therefore, national policymaking should pay systematic attention to building equitable environments that encourage and enable healthy behaviour in different socio-economic groups.

The results at the school organisational level show that the core STP enforcement challenges relate to individual-level factors (i.e., uncertain staff ignore rule violations, and enforcement is challenging with vulnerable students), and schools have to adapt enforcement to avoid the unintended negative outcomes that might otherwise take place when they implement top-down policies in real-life settings. European schools in this study called for more support to tackle enforcement challenges, especially those encountered with vulnerable students. Our results show that although enforcement challenges are mainly due to individual-level factors, the means to adapt enforcement and respond to the challenges are mainly to be found within the social and societal contexts. Strengthening societal support for schools and outlining possible adaptation strategies might help schools to overcome enforcement challenges. It might also help to tackle some of the fears that are currently preventing countries from implementing more comprehensive STPs (Schreuders et al., 2019), such as smoke-free school hours that extend the smoking ban to the whole school day (Hjort et al., 2021). Adaptation, especially systematic adaptation, is increasingly also discussed in IS (Movsisyan et al., 2019), but stronger consideration could also be given to the targets and interactions among implementers (Nilsen & Bernhardsson, 2019, 2020).

7.1.2 National actors, European regulations and the industry

Aligning with the initial understanding of the key determinants of national policy implementation (Cairney, 2012; Cairney & Mamudu, 2014; Room, 2015; Willemsen, 2018), our results show that the implementation of tobacco policies into national legislation and regulations is a complex process determined by interactions between the actors that hold power. National tobacco control actors – that is, health ministries, research institutions, civil society and public opinion/support – are the core reason for strong national tobacco policies in the Nordic countries. The resources and commitment of these

actors and their networking has facilitated Nordic countries to implement some advanced policies (i.e., policies recommended but not required by the WHO FCTC) and in some cases to be among the first countries in the world to do so, as with Finland's tobacco endgame objective and its ban on flavours in e-cigarettes. However, it has recently been stressed that insufficient resources and funding are an obstacle to Finland's tobacco endgame goal (Timberlake et al., 2019). Therefore, to ensure sustainable progress in tobacco prevention, it is vital to ensure the necessary resources for national tobacco control actors and their coordinated collaboration. Earmarking money from tobacco taxes for prevention might be one way to provide more funding for these actors. This is not being done systematically in the Nordic countries at present.

Intersectoral collaboration is also emphasised by the health-in-all-policies approach (HiAP), which emphasises the consideration of health, well-being and equity in all policymaking and the construction of health-promoting environments via horizontal collaboration (Ollila et al., 2013). Communicating national tobacco prevention via HiAP might ensure commitment to tobacco prevention across policymakers and facilitate the implementation of more comprehensive tobacco policies. As an equity-oriented approach, HiAP might also help to tackle socio-economic differences in smoking, which cause major challenges in schools, for instance. In Finland, HiAP is implemented in tobacco control in various ways. A cross-governmental tobacco and nicotine policy development working group established by the Ministry of Social Affairs and Health assesses progress and proposes actions to move forwards. In a report submitted in January 2023, this working group suggested continuing systematic increases in tobacco tax, raising the age limit for tobacco and nicotine products to 20 years, and extending smoking bans to various outdoor areas, such as terraces (Ministry of Social Affairs and Health, 2023). Also, the Tobacco-Free Finland network, which consists of organisations (including school representatives) and public authorities, has played an important role in Finnish tobacco policy since 2008 (WHO, 2020). Strengthening HiAP in global and European regulations in line with Europe's Beating Cancer Plan (European Commission, 2021a) and its implementation roadmap (European Commission, 2022) might reinforce the integration of HiAP within and across countries.

A recent assessment of the WHO FCTC's impact on progress in several countries (Craig et al., 2019) stressed the strengths of global agreements by indicating that the WHO FCTC had broadened political support for tobacco control, facilitated cross-sectoral collaboration, promoted a strong role for civil society and provided protection from the tobacco industry. In the Nordic countries, the WHO FCTC and EU directives on tobacco products (TPD), taxation (TTD) and advertising (TAD) have harmonised tobacco policies across countries and ensured that the core preventive measures required by the WHO FCTC, such as smoking bans in indoor public places and schools, are mostly in place. However, the WHO FCTC and EU directives also have deficiencies and provide little support for countries with stronger tobacco control, which explains countries' shared policy weaknesses. These weaknesses are especially seen in the lack of regulation of novel tobacco and nicotine products: the TPD and TTD do not apply to all novel products such as nicotine pouches (European Commission, 2020, 2021b), and the 2009 council recommendation on smoke-free environments does not cover novel products such as e-cigarettes and HTPs (Beaujet et al., 2020). Deficiencies in the TPD have also forced countries to delay progress or even hindered their policies (e.g., Finland and Norway have had to open their national markets to nicotine-containing e-cigarettes). Inconsistent or absent regulation of novel products is also likely to cause increasing challenges in schools, as the use of novel products does not seem to be as clearly marginalised as cigarettes (Scheffels et al., 2023). Strengthening the WHO FCTC and EU regulations is essential to ensure more comprehensive and consistent policies on novel products across countries.

Overall, our own results and other research (Joossens et al., 2022; Willemsen et al., 2022) have found that interference by the tobacco industry is the main barrier to tobacco policy implementation. At the national level, the provision of protection from the tobacco industry needs to be strengthened in line with WHO FCTC (2013) Article 5.3. The implementation of this policy is lacking in the Nordic countries, and the same has also been reported in other countries (Fooks et al., 2017; Hawkins & Holden, 2018; Willemsen et al., 2022). Strict compliance with WHO FCTC Article 5.3 will also be needed during the next TPD revisions, as a recent report has revealed contacts between the tobacco industry, its allies, pro-vaping groups and the European Commission (STOP, 2021). The harmonisation of national tobacco prevention objectives and strategies in line with the Beating Cancer Plan's objective of a tobacco-free generation in Europe by 2040 might also help to tackle interference by the tobacco industry. Furthermore, when European and national tobacco endgame objectives are being formulated, it is important to consider novel products in order to block the tobacco industry's ability to use current tobacco endgame strategies (e.g., 'tobacco harm reduction') to its own advantage (Peeters & Gilmore, 2015). Strengthening protection from interference by the tobacco industry, both nationally and at the European level, would also benefit from a strengthening of European cross-country partnerships, for which there seems to be plenty of room (Willemsen et al., 2021).

7.2   Strengths and limitations

My research has strengths that can make both scientific and practical contributions. I have focused on policy implementation, which is under-represented in tobacco research and public health policy research. A thorough understanding of implementation is crucial to strengthen the effectiveness of tobacco prevention and health promotion and thus to improve public health. To my knowledge, this is the first study to analyse the implementation of preventive tobacco policies at both national and school organisational levels at the same time. To analyse policy implementation, I utilised concepts from both PI and IS. By combining these perspectives on tobacco prevention policy, I have demonstrated the potential of collaboration between PI and IS for public health research and practice. To my knowledge, this thesis is also the first comprehensive comparison of preventive tobacco policies in the Nordic countries based on official tobacco policy implementation documents (WHO, 2021c; WHO FCTC, 2020). The results from the Nordic countries may inform existing tobacco control policy comparisons by demonstrating the importance of considering the changing tobacco product landscape when assessing policy implementation.

My study has a comprehensive theoretical and conceptual basis, which in combination with rich cross-country data and robust analysis methods allowed me to produce deep and nuanced explanations about how context can interact with policies and influence policy implementation via specific mechanisms. By using these methods, I also identified unintended negative outcomes, which have rarely been the focus of previous research (Biallas et al., 2022). The identification of these causal pathways made it possible to suggest strategies to strengthen tobacco policy implementation at both national and school organisational levels in ways that take account of the complexity of real-life policy implementation. Despite its potential, my study's approach (e.g., its cross-country study design using qualitative methods) has rarely been used in previous tobacco policy research.

There are also limitations to this study. My cross-country approach included many European countries, but none of these were from Eastern Europe, where smoking prevalence is generally higher than in the countries I included (Reitsma, Kendrick et al., 2021). The inclusion of some Eastern European countries might have provided additional contextual information about policy

implementation – for example, about the impact of the tobacco industry. However, there were also large differences in adolescent smoking prevalence and tobacco control among the countries included in the study. As smokeless and novel products are posing increasing challenges to tobacco prevention, it might be considered a limitation that my school-level analysis focused exclusively on cigarettes. However, my national-level analysis studied a comprehensive set of products.

As the research process unfolded, my understanding of the fact that I was doing implementation research became clearer. If I had understood this earlier, I could have used concepts and understandings from IS and PI at an earlier stage. For instance, the initial programme theory in Article I could have relied more strongly on some of the existing IS theories, models and frameworks to identify potential contextual factors, mechanisms and outcomes. However, the thesis as a whole was guided by a strong theoretical and conceptual framework for the study of implementation. Nevertheless, it must be noted that I could also have made different choices during the development this framework. For example, I could have utilised normalisation process theory (May & Finch, 2009), focusing on the role of social context in implementation to explain school staff enforcement of STPs. Normalisation process theory is often used in implementation studies. However, the broader approach I chose for the theoretical framework allowed me to approach the data more inductively, which was reasonable to meet the aims of this study.

There are also some specific limitations concerning the national- (Article IV) and school-level (Articles I–III) analyses. The national-level policy comparisons demonstrate the situation in 2020–2022, but this might change quickly as new regulations are enacted. For instance, when I compared the TCS rankings for 2019 and 2021, I found that the rankings improved considerably for the Netherlands (from 14th to 9th) and Denmark (from 29th to 13th). The Netherlands' improvement was due to the implementation of many different policies, such as a ban on smoking rooms in workplaces, bars and restaurants, a display ban, plain packaging, tax increases and ratification of the WHO FCTC Illicit Trade Protocol; Denmark's improvement was due, for instance, to the implementation of tax increases, a display ban and plain packaging (Joossens et al., 2022). Moreover, even though my research detected many potential contextual factors with regard to national-level policy implementation, certain aspects and data are likely to have been better represented than others, as the countries varied in terms of publicly available data.

Although the realist approach applied in Article I allowed me to produce compelling results, the method itself was complex and time-consuming. Also, in line with reflections in other studies (Greenhalgh & Manzano, 2022; Shaw et al., 2018), it was sometimes challenging to define mechanisms and separate it from context and outcomes. In the programme theory (Figure 6), I should have made a clearer distinction between mechanisms and outcomes, as well as defining more specific and objective outcomes. Currently the mechanisms and outcomes overlap somewhat, as the outcomes merely define the concepts (e.g., motivation for STP enforcement) for which the mechanisms provide situation-specific explanations (e.g., staff perceive that their contribution leads to positive outcomes). I should also have illustrated the interconnections between the CMOs more clearly in the programme theory. I have responded to these deficiencies in the thesis's programme theory (Figure 9).

Collecting the school staff interview data included the participation of multiple interviewers to ensure that the interviews were held in the participating countries' principal languages. Although there was a collectively agreed topic guide and a joint training session, the degree to which interviewers prompted staff to elaborate on their perceptions and experiences varied across the interviews. We might possibly have uncovered more detail if the interviewees had more comprehensively discussed their confidence about STP enforcement (Article II) and their ignoring of persistent violators' rule violations (Article III). Translating the topic guide into the respective countries' principal languages,

and then translating the interview transcripts back into English for analysis, may also have affected the level of detail and nuance in some of the transcripts. However, given the large number of interviews collected in various schools in different countries and the similar patterns detected across the data set, I believe we were able to produce a consistent and comprehensive understanding of school staff members' STPs enforcement. My close collaboration with another researcher (Schreuders) during the analysis also helped me to ensure a deep analysis of the rich data.

7.3   Conclusions and future research

The results of this study show that there is a need to reinforce the implementation of preventive tobacco policies in order to achieve the tobacco endgame goal within and across European countries. Policy implementation can be supported by strengthening specific contextual factors. The *outer context* – which at the school organisational level refers to the societal context, and at the national level to the European and global context– is critical for policy implementation. According to our results, one way to reinforce the outer context to support policy implementation is to strengthen top-down policies. Top-down policies refer at the national level to EU regulations and WHO FCTC provisions and at the school organisational level to national legislation and regulations. Top-down policies influence implementation at lower levels by defining the policies to be implemented but also by determining the phenomenon and circumstances where the policies are implemented. For instance, EU regulations define national legislation and regulations, but also shape the overall tobacco epidemic and the power of the tobacco industry. National regulations, on the other hand, define STPs but also determine the social norms and prevalence of adolescent tobacco and nicotine use. Top-down policies may also have unintended negative consequences for implementation at lower levels which needs consideration. For example, EU regulations have forced countries to delay or weaken their national tobacco policies, and national legislation compelling schools to enforce STPs has led to enforcement challenges with vulnerable students. Adaptation is needed to avoid these unintended negative consequences.

Thus, according to our results, it is particularly important to strengthen the multilevel *social context* in order to ensure that the outer context can best support policy implementation at both school organisational and national levels. Our results show that the social context includes interactions between staff within organisations such as schools, as well as interactions between organisations and tobacco control actors at national and international levels. Strengthening collegial support at the school level and horizontal collaboration at the national and international levels may be the key strategy to support tobacco policy implementation and ensure sustainable progress. Furthermore, it is important to reinforce bottom-up voices in horizontal collaborations in order to ensure that the challenges encountered at the school level will be better considered in national decision-making, and also that the challenges encountered at the national level will be better considered in European and global decision-making on tobacco policies. Strengthening top-down policies will reinforce those policies' ability to support implementation at lower levels.

This study has revealed potential topics for further research. Generally, more research on tobacco policy implementation is needed. The new evidence could be used, for instance, to revise the program theory of this thesis. I suggest that this future research should especially focus on the enforcement challenges that are faced with different policies and at different implementation levels. For example, enforcing smoking bans in outdoor areas, or in organisations other than schools, is likely to entail distinctive challenges (see e.g., Garritsen et al., 2022; Septiono et al., 2020; Titus et al., 2022). I also encourage research on the challenges posed by smokeless and novel tobacco and nicotine products for

policy implementation and enforcement. For instance, one recent study has shown that young people find it fairly easy to circumvent smoking bans with e-cigarettes, and that the current enforcement of TAPS bans on the Internet and social media is insufficient (Scheffels et al., 2023). The results of my study can also inform comparisons of current tobacco controls such as the TCS (Joossens et al., 2022) by demonstrating the importance of considering the evolving tobacco product landscape in evaluations of policy implementation.

In addition to tobacco control, we need to understand implementation in all aspects of public health and health promotion, including system- and population-level policies, education that focuses on individual-level health behaviour changes, and clinical health services. In Finland, for instance, this understanding is urgently needed regarding the reform of the health and social services that came into force at the beginning of 2023. Generally, investing in research on policy implementation using the HiAP approach may be a way to support health promotion and public health. Some research on HiAP implementation at local (Guglielmin et al., 2022), national (Kokkinen et al., 2019) and international level (Koivusalo, 2010) has already been conducted. The cross-country research design using qualitative methods with realist approach that was applied in this study might provide a valuable means to study many of these suggested future research topics.

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9 ATTACHMENTS

ATTACHMENT 1: ENGLISH INTERVIEW GUIDE

SILNE-R TOPIC GUIDE FOR THE INDIVIDUAL SCHOOL STAFF INTERVIEWS

The school staff interviews aims to:

- Explore how tobacco control policies (restrictions and bans on smoking) and education on tobacco (e.g., interventions, curricular programs, curriculum) are implemented (adopted, enforced, maintained) in schools and how different processes and factors have influenced the implementation.

- Explore staff members` responses and experiences on the implementation of school tobacco-control policies and education on tobacco and how different factors and processes have supported or challenged their activities.

General information about the interview:

- Welcome the participant and introduce yourself.

- Give brief information about the SILNE-R project and the aims of the interview: Part of European study including school staff interviews from seven different countries. Exploring staff members` experiences on the implementation of school smoking bans and education on tobacco.

- Describe the practicalities (e.g., timing 45-60 min), explain confidentiality (e.g., anonymity, data protection) and ask if the interviewee agrees with recording.

- Explain the format of the interview (e.g., open questions, exploring staff member`s perspectives on the topics).

- Check if the participant has any questions at this point.

- Ask the interviewee to fill out the informed consent.

- Ask if it is possible to proceed to the interview.

- Start recording.

A) WARMING UP

Open the interview by briefly asking some basic information about interviewee`s role and tasks at school and how long she/he has been working in this school.

Topic 1 Context (e.g., prevalence of smoking, social norms)

Looking at you school, what kind of role does tobacco have, how visible is smoking and have this changed during the years you have worked in this school?

- What have influenced the change?

  - e.g., overall image of tobacco, changes in law?

- How are the smoking bans or restrictions complied with?

B) SMOKING BANS

Topic 2 Adoption of current smoking ban policies

Could you describe how long the current bans/restrictions have been in place in your school and did you work in the school when these were adopted and implemented in the first place? Have the bans/restrictions changed during the time you have been working in the school? (If the interviewee has not knowledge on this topic, move to topic no. 3.)

- Why were these specific bans/restrictions implemented?

- Where did the initiative to the implementation come: from the school or outside the school?

- How and by whom was the decision on the implementation made and why were the bans and restrictions formed as they are?

  - e.g., what facilitated or hindered the decision-making process leading to implementation of rudimentary vs comprehensive smoking ban/restrictions

Topic 3 Facilitators and barriers for comprehensive smoking ban (smoking prohibited for students, staff, visitors at all times both inside school buildings and outside premises)

a) If there is not a comprehensive smoking ban implemented in your school, what are the reasons for this and what would support the adoption and implementation?

b) If there is a comprehensive smoking ban implemented in the school, what were the reasons and possible support for this?

Topic 4 Responses of staff members

How have staff members responded to the bans/restrictions on smoking or the changes in them in your school and what could be the possible reasons for these responses?

- Commitment of staff (e.g., principal/vice principal, health promotion coordination team, teaching, and non-teaching staff) to the enforcement of tobacco-free environment and what could explain their stance?

- How have the school managed the possible resistance on bans?

Topic 5 Enforcement practices

Could you describe the ways in which the restrictions or bans on smoking are enforced in your school and how are these enforcement practices working on a daily basis?

- Possible enforcement practices: communication practices, signs for prohibiting smoking, monitoring during the breaks, consequences for violation, smoking cessation provided etc.

- Which practices are working well and why?

- What kind of challenges are encountered, how have the problems been solved, what is needed to be better tackle the problems?

  - e.g., smoking in the vicinity of school border and entrance, staff smoking

- Why are these specific enforcement practices implemented and not some others?

- Have staff members and/or students or parents participated in planning and developing the enforcement practices?

Topic 6 Facilitators and challenges for staff members` enforcement activities (decision making and behavior)

Which factors have supported or challenged staff members` enforcement activities (e.g. does or does not intervene on student smoking) and why have those influenced in these ways?

  - e.g., senior management`s support, clearly communicated official stance, feeling of responsibility, knowledge, and confidence to take action on student smoking, school characteristics, multiple problems among students, existing workload.

Topic 7 Maintenance of the policy

How is the maintenance of the policy managed in your school?

  - e.g., monitoring the prevalence of smoking, documenting the violations of the policy, evaluating the progress, updating the policy.

C) EDUCATION AND TRAINING ON TOBACCO

Topic 8 Education practices

- How is tobacco education carried out in your school, what kind of training do adolescent get?

  - e.g., Part of specific subjects, curricular programs, interventions on tobacco or other health issues.

- If multiple, discussed separately.

- Permanent or temporary practices and why?

- Who are carrying out the programs/education?

- If the school does not have any education on tobacco, what are the reasons for this? What could support the adoption and implementation?

Topic 9 Reasons for adoption and implementation

- Could you describe, why this programs/education, and not some others, have been adopted and implemented in your school?

- How was the decision on the adoption and implementation made?

- Who have been involved in the decision making?

Topic 10 Best practices on tobacco education

What kind of education/programs have been working well in your school and what kind have not and what are the possible reasons for this?

- In what ways have staff responded to different kind of education/programs on tobacco and what could be the possible reasons for these responses?

- What kind of education seems appropriate, attractive and effective for students and seems to reach different kind of students, e.g., those who smoke?

- What would be the best way to carry out tobacco education and why?

Topic 11 Factors influencing staff members readiness to tobacco education

Which factors have supported or challenged staff members` readiness (commitment, acceptance, motivation) for tobacco education and why?

   o e.g., lack of training, existing workload, support from active NGOs.

D) CLOSURE

Topic 12 Further support needed

What could further support your school to become and enforce more tobacco-free environment?

   o e.g., law that enables staff to take tobacco products away from students, closer collaboration with NGOs etc.

Topic 13 Anything to add

Is there anything else you would like to discuss on the topic that have not been discussed yet?

After the interview:

- Ask interviewee to fill out the short questionnaire.

- Thank participant for his/her valuable contribution to the project.

- Give interviewee the information letter about SILNE-R project with your contact details.

- Fill out the field notes.

ATTACHMENT 2: OVERVIEW OF THE INTERVIEWEES

Country	School	Position	Age group	Smokers
BEL	1	Supportive	40-50	
BEL	1	Teacher	30-40	
BEL	1	Management	50-60	
BEL	2	Supportive	30-40	
BEL	2	Teacher	40-50	
BEL	2	Management	40-50	
BEL	3	Supportive	30-40	
BEL	3	Teacher	30-40	
BEL	3	Management	40-50	
BEL	4	Supportive	30-40	
BEL	4	Teacher	40-50	
BEL	4	Management	50-60	
BEL	1-4			3/12
FIN	1	Management	40-50	
FIN	1	Teacher	30-40	
FIN	1	Teacher	50-60	
FIN	2	Teacher	50-60	
FIN	2	Teacher	30-40	
FIN	2	Management	50-60	
FIN	3	Teacher	30-40	
FIN	3	Teacher	40-50	
FIN	3	Management	40-50	
FIN	4	Teacher	40-50	
FIN	4	Teacher	50-60	
FIN	4	Management	50-60	
FIN	1-4			1/12
GER	1	Teacher	50-60	
GER	1	Teacher	60-70	
GER	1	Teacher	60-70	
GER	1	Teacher	40-50	
GER	2	Teacher	40-50	
GER	2	Teacher	30-40	
GER	2	Teacher	30-40	
GER	3	Teacher	30-40	
GER	3	Teacher	20-30	
GER	3	Teacher	30-40	
GER	3	Teacher	30-40	
GER	1-3			2/11
IRL	1	Management	50-60	
IRL	1	Teacher	40-50	
IRL	1	Teacher	50-60	
IRL	2	Teacher	20-30	
IRL	2	Teacher	40-50	
IRL	2	Management	50-60	
IRL	3	Management	50-60	
IRL	3	Teacher	60-70	

IRL	3	Supportive	40-50	
IRL	4	Supportive	50-60	
IRL	4	Management	30-40	
IRL	4	Management	60-70	
IRL	1-4			0/12
ITA	1	Supportive	50-60	
ITA	1	Management	60-70	
ITA	1	Teacher	50-60	
ITA	2	Supportive	50-60	
ITA	2	Management	40-50	
ITA	2	Teacher	40-50	
ITA	3	Management	40-50	
ITA	3	Supportive	40-50	
ITA	3	Teacher	50-60	
ITA	4	Teacher	50-60	
ITA	4	Teacher	40-50	
ITA	4	Management	50-60	
ITA	1-4			2/12
NLD	1	Teacher	30-40	
NLD	1	Management	50-60	
NLD	1	Supportive	40-50	
NLD	1	Management	30-40	
NLD	2	Supportive	60-70	
NLD	2	Management	50-60	
NLD	2	Teacher	60-70	
NLD	3	Management	50-60	
NLD	3	Teacher	30-40	
NLD	3	Supportive	50-60	
NLD	4	Teacher	30-40	
NLD	4	Supportive	40-50	
NLD	4	Management	60-70	
NLD	1-4			2/13
POR	1	Management	50-60	
POR	1	Teacher	50-60	
POR	1	Management	60-70	
POR	2	Management	50-60	
POR	2	Teacher	30-40	
POR	2	Teacher	30-40	
POR	3	Management	50-60	
POR	3	Teacher	50-60	
POR	3	Teacher	50-60	
POR	1-3			5/9

ATTACHMENT 3: ASSESSED WHO FCTC POLICIES AND THEIR KEY INDICATORS

WHO FCTC policies	Key indicators for the Articles from the WHO FCTC Implementation Database*
Price and tax measures (WHO FCTC Article 6)	**Core policies:** C211 - Tax policies to reduce tobacco consumption** **Advanced policies**: B81 - Proportion of the retail price consisting of taxes*** B85 - Tobacco tax earmarking**
Smoke-free policies (WHO FCTC Article 8)	**Core policies** C221 - Tobacco smoking banned in all public places ** C226a1 - Comprehensiveness of protection in government buildings C226a2 - Comprehensiveness of protection in health-care facilities C226a3 - Comprehensiveness of protection in educational facilities C226a4 - Comprehensiveness of protection in universities C226a5 - Comprehensiveness of protection in private workplaces C226b1 - Comprehensiveness of protection in airplanes C226b2 - Comprehensiveness of protection in trains C226b3 - Comprehensiveness of protection in ferries C226b4 - Comprehensiveness of protection in ground public transport C226b5 - Comprehensiveness of protection in motor vehicles used for work (taxis, ambulances, delivery vehicles) C226c1 - Comprehensiveness of protection in cultural facilities C226c2 - Comprehensiveness of protection in shopping malls C226c3 - Comprehensiveness of protection in pubs and bars C226c4 - Comprehensiveness of protection in nightclubs C226c5 - Comprehensiveness of protection in restaurants **Advanced policies:** C226b6 - Comprehensiveness of protection in private vehicles
Content of tobacco products (WHO FCTC Article 9)	**Core policies** C231 – Testing and measuring the contents of tobacco products C232 – Testing and measuring the emissions of tobacco products C233 – Regulating the contents of tobacco products C234 – Regulating the emissions of tobacco products
Packaging and warning labels (WHO FCTC Article 11)	**Core policies** C251 - Packaging of tobacco products do not carry advertisement or promotion C252 - Misleading descriptors banned C253 - Health warnings required C254 - Health warnings approved by the competent national authority C255 - Rotated health warnings C256 - Large, clear, visible and legible health warnings C257 - Minimum requirements of warnings mandated by law C258 - Health warnings occupying no less than 30% of the principal display area C25131 – Packaging contains information of constituents of tobacco products C25132 – Packaging contains information of emissions of tobacco products C2514 - Warning required in the principal language(s) of the country

	Advanced policies:
	C259 - Health warnings occupying 50% or more of the principal display area
	C2510 - Health warnings in the form of pictures or pictograms
Advertising, promotion, and sponsorship (WHO FCTC Article 13)	**Core policies**
	C271 - Comprehensive ban on all tobacco advertising, promotion and sponsorship**
	C2729 - Ban covering cross-border advertising originating from the country
	Advanced policies:
	C2721 - Ban on display of tobacco products at points of sales
	C2722 - Ban covering the domestic internet
	C2723 - Ban covering the global internet
	C2724 - Ban covering brand stretching and/or sharing
	C2725 - Ban covering product placement
	C2726 - Ban covering the depiction/use of tobacco in entertainment media
	C2727 - Ban covering tobacco sponsorship of international events, activities and/or participants therein
	C2728 - Ban covering corporate social responsibility
	C27210 - Ban covering cross-border advertising entering the country
Sales to and by minors (WHO FCTC Article 16)	**Core policies**
	C321 – Sales of tobacco products to minors prohibited
	C321a – Minimum legal age for sale/purchase of tobacco products**
	C322 – Clear and prominent indicator required
	C323 – Required that sellers request for evidence of having reached full legal age
	C324 – Ban of sale of tobacco in any directly accessible manner
	C325 – Manufacture and sale of any objects in the form of tobacco products prohibited
	C327 – Tobacco vending machines not accessible to minors**
	C3281 – Distribution of free tobacco products to the public prohibited
	C3282 – Distribution of free tobacco products to minors prohibited
	C3210 – Penalties against sellers provided
	C3211 – Sale of tobacco products by minors prohibited
	Advanced policies:
	C326 – Sale of tobacco products from vending machines prohibited
	C329 – Sale of cigarettes individually or in small packets prohibited

*The division of the measures to core and advanced policies for this article has been conducted by HO by the strength of the language in the Convention. The core policies include measures required in the treaty with language indicating that Parties shall adopt or take other effective actions. The advanced policies include recommended measures in the treaty or in its implementation guidelines with language indicating that Parties shall endeavor to, should or may take actions, or where actions are listed after "as appropriate", or where Parties have the option to restrict instead of taking effective actions.

** Not included in the calculation, covered only for the text.

*** For the proportion of the total tax rate, most recent information from the WHO Global Tobacco Epidemic 2021 - report was utilized.

ATTACHMENT 4: INFORMATION LETTER AND INFORMED CONSENT FORM

INFORMATION LETTER FOR SCHOOL STAFF PARTICIPATING IN INDIVIDUAL INTERVIEWS.

SILNE R: Enhancing the effectiveness of strategies to prevent smoking by adolescents

The SILNE-R project aims to learn, by in-depth comparisons between seven European countries, how strategies to prevent youth smoking could enhance their effectiveness by taking into account the opportunities, barriers and resources present at local levels. Top researchers from different disciplines and different European regions will work together and link up with international research networks concerned with tobacco control or youth health. We will generate the fine-grained evidence that is needed to support decision makers in implementing smoking prevention strategies that are responsive to local conditions, effective in using available resources, and inspired to reduce inequities. The project is funded by European Union`s Horizon 2020 research and innovation programme.

For more information on the project and the progress, please visit the SILNE-R international website.

SILNE-R, WORK PACKAGE 7: IMPLEMENTING SCHOOL TOBACCO CONTROL POLICIES IN SEVEN EUROPEAN CITIES.

The general objective of the school-level analysis (WP 7) is to assess which practices, processes, and contextual factors influence the implementation of school tobacco control policies in seven European cities from Belgium, Finland, Germany, Ireland, The Netherlands, Portugal, Italy. The aim is to formulate explanatory theory and context-sensitive guidelines for a comprehensive implementation of school tobacco control policies by combining information gathered in realist-informed systematic review and semi-structured interviews with school staff.

Interviews: we will conduct interviews with three informants among school staff (e.g., principal, vice principal, teachers, non-teaching staff) in four different schools in each of the seven cities. Duration of each interview will be 45-60 minutes and the interviews will be conducted in the school premises. Interviews will be recorded digitally, transcribed verbatim, translated into English and analysed in Finland. Participation in the interviews is voluntary and interviewees can cancel the participation at any time.

The handling of interview data will comply with the Personal Data Protection Act. Only data relevant for the conduct and analysis of the SILNE-R project will be collected. Complete confidentiality of the interview data will apply, and the data processing will conform to the requirements of national and European legislation on data protection. All data obtained will be anonymised and protected from unauthorised access. The name or any identification of the interviewees will not be sent to Finland

from other countries. All data will be transferred into password-protected computer systems that are accessible only for particular tasks related to the SILNE-R project.

If you want to ask or add something after the interview, please contact

Your name_____Email_____

SILNE-R WORK PACKAGE 7

IMPLEMENTING SCHOOL TOBACCO CONTROL POLICIES IN SEVEN EUROPEAN CITIES: SCHOOL STAFF INTERVIEWS

I have been asked to participate in the above-mentioned scientific study. I have received information about the study and had a chance to ask the researchers questions about the study.

I understand that participation in the study is voluntary and that I have the right not to participate and the right to withdraw my consent at any given time without giving a reason. I also understand that all information given and recorded will be confidential.

I agree to participate in this study

Place _____

_____   _____

Date   Participant's signature

10 PUBLICATIONS

PUBLICATION
I

Understanding school staff members' enforcement of school tobacco policies to achieve tobacco-free school: A realist review

Linnansaari, A., Schreuders, M., Kunst, A. E., Rimpelä, A., & Lindfors, P.

Systematic Reviews

RESEARCH   Open Access

Understanding school staff members' enforcement of school tobacco policies to achieve tobacco-free school: a realist review

Anu Linnansaari[1], Michael Schreuders[2], Anton E. Kunst[2], Arja Rimpelä[1,3,4] and Pirjo Lindfors[1*]

Abstract

Background: School tobacco policies (STPs) that aim to achieve a tobacco-free environment require consistent enforcement by school staff. However, little is known about why staff choose whether or not to enforce STPs. Therefore, we investigated staff members' responses to STPs that determine enforcement. Furthermore, we examined how these responses depend on contextual factors at the individual, interpersonal, school, implementation, and national levels.

Methods: We performed a realist review (RR), which synthesizes existing primary evidence into a programme theory demonstrating key causal pathways through Context-Mechanism-Outcome configurations (CMOs). These CMOs link contextual factors to outcomes (i.e. staff enforcement) by explaining the underlying generative mechanisms (i.e. staff members' cognitive, psychosocial, and behavioural responses). A systematic literature search for the period 2000–2016 was performed using Academic Search Premier, PsycInfo, and MEDLINE. Forty English-language articles were identified for the synthesis.

Results: Our programme theory demonstrated three CMOs: when contextual factors make staff members experience STP enforcement as part of their professional role and duties, it may lead to staff members showing responsibility for STP enforcement (CMO1); when contextual factors make staff members feel their contribution is leading to positive outcomes, it may lead to staff members showing motivation to enforce STPs (CMO2), and when contextual factors make staff members feel that they are able to deal with students' responses, it may lead to staff members showing confidence in STP enforcement (CMO3). Moreover, the programme theory provided more precise insights into what contextual factors contribute to triggering the individual mechanisms and the consequent outcomes.

Conclusions: By applying a realist approach, we have been able to detect three CMOs explaining staff members' STP enforcement. The findings provide useful insights explaining how stakeholders can support staff members' STP enforcement and consequently improve the impact of STPs on adolescent smoking.

Keywords: School tobacco policies, Implementation, Enforcement, School staff members, Realist review

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Background

School tobacco policies (STPs) aim to decrease adolescent smoking behaviour and exposure to second-hand smoke by restricting smoking only to certain areas or banning smoking completely in the school buildings and outside premises during school hours. The rationale for STPs is based on research evidence showing that (i) the onset of smoking usually occurs in adolescence, (ii) schools have a major influence on adolescent smoking uptake, and (iii) schools are significant settings for health promotion [1]. Moreover, STPs receive wide public support [2] and are considered an essential element in the tobacco de-normalizing process with the aim of making the future smoke-free [3].

Research shows that STPs effectively decrease adolescents' exposure to second-hand smoke [4–6], but evidence about their impact on smoking behaviour remains inconclusive [7, 8]. Reviews have explained the conflicting evidence by highlighting the differences in the implementation of STPs, something that most studies have not adequately taken into account [7, 8]. Implementation refers to the process of integrating and enforcing new practices within a setting [9]. A key element of implementation that improves the effectiveness of STPs on adolescent smoking behaviour is strict and consistent enforcement by school staff members [7, 8, 10]. According to Schreuders et al. [10], strict and consistent enforcement is important for three reasons. First, adolescents may make use of staff members who do not strictly enforce the smoking ban by using them as opportunities to smoke. Second, staff members' inconsistent enforcement may lead adolescents to perceive the smoking ban as unfair (e.g. different sanctions applied to different adolescents). Third, adolescents may start rebelling against the school's authority when the rules are perceived to be inconsistent.

While staff enforcement is important for the effectiveness of STPs, there is only a limited understanding of what determines the consistency of staff members in terms of STP enforcement. Research has demonstrated a connection between staff members' responses to STPs and the staff's actual enforcement behaviour. For instance, Gordon and Turner's [11] study showed that the perceived effectiveness of STPs combined with the staff's personal and professional values, sense of authority, and perceived issues regarding their own safety influenced the staff's STP enforcement. These responses, in turn, likely depend on differences in context. A realist review [12] on the implementation of health promotion programmes in schools showed how the responses of staff members that are needed for adequate implementation depend on different school-level contextual factors. For example, teachers are more likely to devote their time and energy to programme implementation if they believe that they will get practical and educational support.

Most of the current literature on STP enforcement by staff members report either on the context or on the responses, but how these factors are connected is rarely explained. Our realist review will contribute to this gap in the current understanding by explaining how staff members' responses, which make up their STP enforcement, differ across contexts. The realist review is a suitable method, because it aims to explain how contextual factors (in our case, at the individual, interpersonal, school, implementation, and national levels) produce outcomes (in our case, staff enforcement) by specifying the underlying generative mechanisms (in our case, the staff's cognitive, psychological, and behavioural responses) [13]. We aim to draw together existing evidence and build an evidence-based programme theory that answers the following question:

1. How do contextual factors at the individual, interpersonal, school, implementation, and national levels (Context) contribute to triggering staff members' cognitive, psychosocial, and behavioural responses (Mechanism) that may support their STP enforcement (Outcome)?

Methods

A realist review is an explanatory method that aims to describe what works for whom, under what circumstances, and how. It synthesizes evidence into a programme theory explaining how differences in contexts may lead to outcomes by forming the enabling conditions that allow generative mechanisms to occur [13]. The generative mechanisms are the underlying processes or hidden causal levers that account for how and why policies or programmes work to bring about changes in the reasoning and behaviour of individuals [14]. The realist review consists of six iterative steps: (1) identifying the review questions; (2) formulating the initial programme theory; (3) searching for primary studies; (4) selecting and appraising the studies; (5) extracting, analyzing, and synthesizing relevant data; and (6) refining the programme theory [13]. Step 1 was done in the "Background" section above, and the remaining steps are reported below. We followed the RAMESES publication standards for realist reviews [15].

Formulating the initial programme theory

The initial programme theory (Table 1)—i.e. the initial understanding of the CMO configurations—was formulated between January and March of 2016. To build up the initial programme theory, we first read recent literature reviews on STPs [1, 7, 8, 16]; policy reports and guidelines for STP implementation from Finland, which has a long tradition in implementing these policies [17–21]; and a review on the implementation of Health Promoting Schools

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Table 1 Initial programme theory explaining how contextual factors may trigger mechanisms that influence staff's STP enforcement

CMO1: Alignment of staff and overall health promoting culture in the school (C), trigger staff's acceptance and readiness for STP enforcement (M), which may lead to staff members' STP enforcement (O)

CMO2: Inclusion of comprehensive and consistent STPs in school policy document that are packed up by legislation (C), trigger priority of abstinence from smoking at school and staff's significant role in ensuring that (M), which may lead to staff members' STP enforcement (O)

CMO3: Supportive leadership and management (e.g. senior management's actions) (C), trigger shared values and motivation for tobacco-free school among staff (M), which may lead to staff members' STP enforcement (O)

CMO4: Continuous and sustainable focus on STPs and other health issues in school (C), trigger changes in school smoking norms (M), which may lead to staff members' continuous STP enforcement (O)

(HPS) [22]. These steps assisted us in identifying the relevant contextual factors. However, the above-mentioned materials did not provide us with sufficient understanding of the mechanisms that might occur and require further testing. Therefore, we interviewed people who had significant work experience in the implementation of STPs: an expert from the Finnish National Institute for Health and Welfare, a school principal, and three teachers from different schools. The interviews helped us to gain an understanding of what possible mechanisms may connect the identified contexts with staff enforcement. The RAMESES guidelines recommend the use of both scientific literature and expert experiences for the development of an initial programme theory [15]. Table 1 presents this initial programme theory.

Searching for primary studies
Next, a systematic literature search was conducted to refine and substantiate the CMOs in the initial programme theory. The systematic search included two separate search strategies (Additional file 1) that were refined in collaboration with information specialists. The two searches were used to generate understanding about STP implementation (search strategy 1), and the implementation of health promotion in schools (search strategy 2). The second strategy was conducted because there is scarce literature on STP implementation, while there is a wealth of literature on the implementation of Health Promoting School concept (HPS) and school health promotion programmes. HPS concept and school health promotion programmes share the same setting and implementation processes, with staff members as key actors, and they therefore provide valuable evidence for refining and substantiating the CMOs in our initial programme theory. Searches were conducted using multiple databases from diverse disciplines (e.g. social sciences, psychology, education, health policy, and health sciences; see

Additional file 1). The language was limited to English and the timeline was from January 2000 to March 2016. We chose to include articles only from 2000 onwards because of the large number of publications.

Selecting studies and appraising their quality
Figure 1 depicts the flow diagram of the searches and selection of the articles. Altogether, 14,685 unique articles were found. From these articles, we first screened titles and abstracts. To be selected further, an article had to provide information on one or more of the following themes: (1) STP implementation, (2) implementation of health promotion in schools, (3) mechanisms explaining staff members' perceptions and behaviour, (4) information on the school as a context, or (5) other contextual factors influencing STP enforcement in schools. Ninety-two full-text articles were selected for further assessment after screening the titles and abstracts. Next, the same inclusion and exclusion criteria were applied to these 92 articles, and this process yielded 50 articles.

Next to articles on STP enforcement, we also included articles on STP adoption (i.e. the decision-making process to implement STPs) because implementation and adoption are not categorically distinct processes.

From the remaining 50 articles, we highlighted the relevant pieces of evidence for our study, and following the RAMESES publication standards for realist reviews, a quality appraisal for relevance and rigour was made for these selected pieces of evidence [15] (Additional file 3). The relevance of the articles with the selected pieces of evidence was assessed according to the extent to which they refined, confirmed, or added to the initial programme theory. Articles with a select piece of evidence that provided in-depth information on mechanisms were defined as "thick". Articles that did not describe mechanisms but provided other relevant information—e.g. understanding on context—were defined as "thin". Seventeen articles did not provide "thick" or "thin" evidence, and they were therefore excluded.

The rigour of the selected pieces of evidence was assessed by examining each article's sample, data collection, and methods of analysis before determining how these features might affect the validity of the evidence. The quality appraisal of rigour was conducted as the last of all the steps; none of the remaining articles was excluded at this point. Two authors (AL, PL) worked together during the selection and appraisal of the studies, and all articles included in the final synthesis were examined and approved by both authors. In addition to the evidence found through the systematic search, seven articles published before or after the timeline of the search were included, as they provided valuable evidence for analysis. These articles were found through citation searching from the articles included and manual

Fig. 1 Flow diagram representing the search, screening, and inclusion of the articles
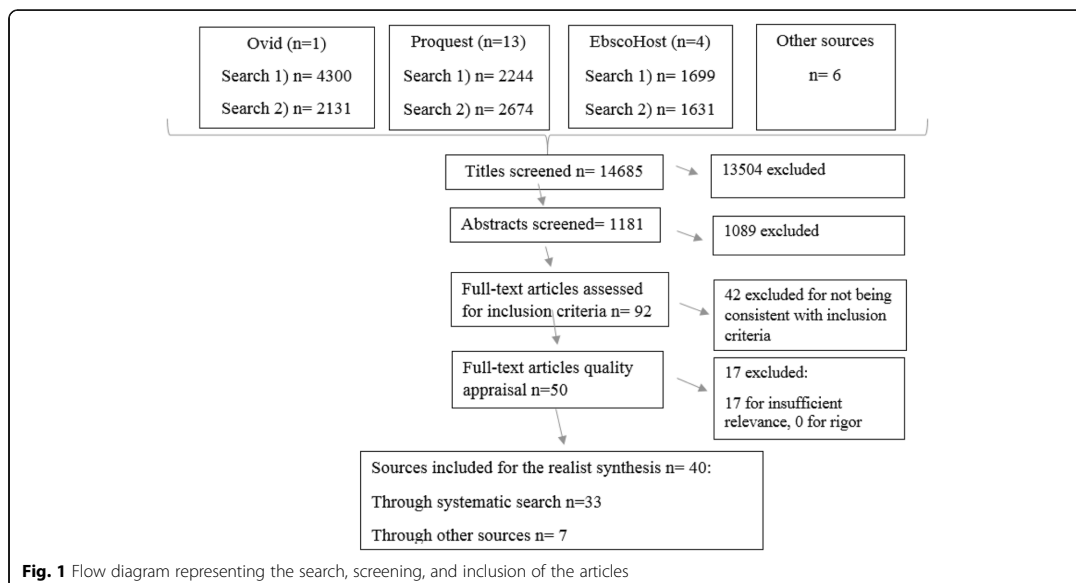
searches of the latest publications. The final number of articles was forty. Additional file 2 outlines the key characteristics of the selected studies.

Extracting, analyzing, and synthesizing relevant data

The first author extracted the relevant pieces of evidence from the selected articles in order to refine or substantiate the initial programme theory. We began the synthesis with the "thick" evidence by studying how contexts, mechanisms, and the staff members' enforcement are connected. Finally, the CMO configurations were compared to the thinner evidence to reveal further contextual refinements. The findings were reflected upon by the authors for a period of 1 month. All authors approved the final programme theory.

Results

We revised the initial programme theory into a refined programme theory. The refined programme theory revised the initial outcome "staff members' STP enforcement" into three sub-outcomes: responsibility, motivation, and confidence in STP enforcement. In addition, the refined programme theory includes many new contextual factors (see Table 2).

The refined programme theory features three CMOs: when contextual factors make staff members experience STP as part of the school staff's professional role and duties, it may lead to staff members showing responsibility for STPs enforcement (CMO1); when contextual factors make staff members feel their contribution is leading to positive outcomes, it may lead to staff

members showing motivation for STP enforcement (CMO2); and when contextual factors make staff members feel that they are able to deal with students' responses, it may lead to staff members showing confidence for STP enforcement (CMO3). The remainder of the "Results" section elucidates each of these CMOs using the evidence that was found during the synthesis.

CMO1: When contextual factors (C) make staff experience STP as part of the school staff's professional role and duties (M), it may lead to staff members showing responsibility for STP enforcement (O)

Staff members tend to commit to enforcement only when they know what is expected of them—i.e. they know what their duties are [12, 22–26]. Gordon and Turner [11] found that uncertainty regarding whether intervention in student smoking was expected or simply desirable in school policies led to variations in the behaviour of school staff. Therefore, anchoring health promotion and STPs in school policies as well as clearly communicating the staff members' duties in STP enforcement—preferably through written policy—may remove any ambiguity as to what is expected, and it may increase the staff's responsibility for enforcement [11, 22, 26–33].

In addition to written policies, the senior management's role in outlining the school values and policies and directing the enforcement is emphasized [12, 25, 29, 30, 33, 34]. For instance, the senior management's commitment to STPs may affect the staff members' perception of the policy's importance [12, 25, 29, 30, 33, 34]

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Table 2 Refined program theory explaining how factors at different contextual levels may trigger mechanisms that influence staff's responsibility, motivation and confidence for STP enforcement

	Factors at different contextual levels	Mechanism	Outcome
CMO1	• Individual Staff's professional identity and values, e.g. health promotion vs academic education	Staff experience STPs part of the school staff's professional role and duties	Responsibility for STP enforcement
	• Interpersonal Staff's perceptions on the influence of enforcement to staff-student relationships		
	• School Existing workload and the significance of tobacco issue in school		
	• Implementation components Anchoring and communicating STP, including staff abstinence from smoking during school hours, as part of the school's core tasks and all staff's role and duties through written policies and senior management's engagement; come up with enforcement practices that do not threaten staff-student relationships		
	• National Legislation on STP and on tobacco in wider environment, e.g. ban on smoking in public places		
CMO2	• Individual Staff's perceptions on schools general ability to influence student smoking Student's characteristics (e.g. nicotine addiction)	Staff perceive that their contribution is leading to positive outcomes	Motivation for STP enforcement
	• Interpersonal Other staff members' participation to the enforcement		
	• Implementation components Coming up with strategies to tackle enforcement problems (e.g. smoking relocation that increase visibility, non-effective enforcement practices for students with nicotine addiction) e.g. to avert inconsistent enforcement among staff, communicating staff about the progress achieved with STP		
	• National Conformity in tobacco norms and aims between school and wider society (i.e. back up for STP)		
CMO3	• Individual Staff member's own smoking status Student's characteristics (e.g. physical or verbal aggression)	Staff feel that they are able to deal with students' responses	Confidence for STP enforcement
	• Interpersonal Staff's familiarity with the student		
	• Implementation components Communicating all staff's authority for STP enforcement and strengthening staff members' skills to enforce with difficult or unfamiliar students		
	• National Legislation on STP and on tobacco in wider environment, e.g. ban on smoking in public places		

and further promote the staff's responsibility for enforcement [11, 22, 31, 35]. Conversely, STP enforcement is perceived of as challenging when the senior management is not engaged [25, 29].

Staff members who perceive that health promotion—e.g. protecting students from the harmful effects of smoking—is compatible with their professional identity, and values show more responsibility for STP enforcement [5, 23, 36]. On the other hand, those staff members who do not consider health promotion a professional duty and have a "philosophical resistance" to modifying adolescents' health behaviour show less responsibility for intervening in student smoking [11, 23, 24, 37–39]. Some staff members may not consider STP enforcement

their duty because they think it distracts from the core task of education: "People forget that we're a school, focusing on the education of students" [23].

Staff members' perceptions of whether their own smoking influences student smoking may have an impact on the staff members' responsibility for STP enforcement. When staff members consider themselves non-smoking role models for students, they may also acknowledge STPs as part of the school's core task [40–42]: "We made people (staff members) aware of what kinds of messages we're sending to our children through tobacco use. When you put it in light of the youths, people are willing to comply" [40]. Furthermore, when staff members perceive that

students support STPs and expect staff to set an example, it may reinforce their responsibility and enforcement: "Hearing from students was the most effective, hearing from them that adults and schools should be setting examples" [40].

National legislation on STPs could be utilized to strengthen the staff's responsibility for STP enforcement. When national legislation compels schools to enforce STPs, the mandatory nature of the laws may make staff members feel more responsible for enforcement [33, 43, 44]. Other tobacco legislation, such as smoking bans in public places, may also increase the acceptance of STPs and in this way increase the staff members' responsibility for enforcement [11, 45–49].

The staff's perceptions of the influence of STP enforcement on staff-student relationships may affect feelings of responsibility for enforcement. If intervening in student smoking clashes with the type of relationship staff members wish to have with students, or which the staff perceive to be the basis for effective collaboration, the inconsistency may lead to prioritizing good relationships over enforcing STPs: "You don't learn to manage them [pupils] by creating lots of rules and making sure that you enforce them. You manage them by establishing the relationship and working with the child, not against the child, and through that relationship to an understanding that there is a way of working together which is in both our interests. And that would be my attitude towards smoking." [11].

School working conditions, like overwork and smoking not being considered a priority health issue, may influence the staff's responsibility for STP enforcement. For instance, perceptions of responsibility may decrease when the school is burdened with other tasks [11, 23, 24, 36, 43] or when other health issues are considered a greater priority [11, 43, 50]: "If you were going to really look at what the health issues are, smoking isn't the most important one" [43].

CMO2: When contextual factors (C) make staff perceive that their contribution is leading to positive outcomes (M), it may lead to staff members showing motivation for STP enforcement (O)

When staff members believe that STP have positive outcomes for the school, staff, or students, it may trigger their motivation for STP enforcement [12, 23, 24, 32, 51, 52]. Staff members' perceptions of whether the school is generally able to influence adolescent smoking may affect their outcome expectations and motivation for enforcement [11, 50]. For instance, if staff members think that peers, parents, and social norms play a more significant role in adolescent smoking than the school, it may compromise their motivation to enforce STPs [11, 45–49].

The behaviour of colleagues is one factor that may influence staff members' perceptions of the ability of STPs to make an impact. If staff members witness their colleagues turning a blind eye to student smoking, their positive expectations of being able to make an impact on students—and thus their motivation to enforce STPs—may decrease [11, 23, 31]. Staff considered the participation of all personnel—i.e. senior management, teaching staff, and non-teaching staff—in STP enforcement to be crucial in influencing student smoking and normalizing smoking bans as a part of the school culture (i.e. becoming a tobacco-free school) [31, 53].

In addition, the characteristics of the smoking student may influence the staff members' expectations on enforcing STPs. For instance, recognizing a student's tobacco addiction may cause a contradiction with the staff members' motivation to enforce STPs, because intervening could be considered "fire-fighting" rather than solving the smoking problem [49]. The school policy on the consequences of breaking the smoking ban was particularly important when dealing with addicted students, as staff members preferred supportive rather than punitive measures [29, 43, 49].

Pearson et al.'s [12] study showed that beliefs about policy effectiveness may change during the implementation process when the positive results are witnessed and valued. Pickett's [48] study showed that staff members' support for the policy increased when they witnessed a decrease in student smoking after implementing the smoking ban. Conversely, when the ban was considered ineffective, a return to designated smoking areas received support from staff members [48]. Therefore, schools may increase staff members' positive outcome expectations and thus motivation for STP enforcement through consistent practices like monitoring, evaluating, and communicating the improvements and effectiveness of STPs [29, 38, 54–58].

STP enforcement may also have negative outcomes that influence the staff's attitudes towards STPs and their motivation for enforcement [24, 25, 29, 33, 40, 42, 51, 59]. Smoking relocation (e.g. from hidden smoking places to the boundaries of the school) was the most often reported negative outcome of STP enforcement, which also decreased the positive outcome expectations of the effectiveness of STPs [29, 43]. The relocation of smoking often increased the visibility of smoking, which staff considered harmful for the de-normalization of smoking in the school [24, 31] and for the school's image, and this therefore influenced the staff's motivation to enforce the STPs [24, 29, 46]: "We'd rather have people hidden at a couple of places throughout the campus than have a large group of smokers as the first thing people see when they arrive" [29]. Furthermore, the relocation of smoking caused a nuisance to the school's neighbours [24, 29, 43, 47] and raised concerns over safety when students left the school grounds to smoke [27, 29, 46–48, 53].

The national context may also play a part in smoking relocation in schools. Existing legislation rarely prohibits smoking in school surroundings, and thus it restricts and sets limits on the staff members' jurisdiction [12, 22–26]. The lack of rules and legal authority to intervene demotivate staff members to enforce the STPs, because the outcomes of the enforcement are negative and visible: "It is legal for kids to smoke on public property, whether that property is one inch or one mile away from school property" [46]. Furthermore, the school may not be entitled to issue sanctions for smoking outside school grounds [11, 29, 46, 47], which the students are also aware of: "they're just going to tell me, 'you're nothing to do with me', you know they're not in the school..." [11]. This limited authority to intervene, even when smoking is clearly visible just outside the school premises, decreased the motivation of staff to enforce STPs [11, 29, 46, 47]. One way to tackle smoking relocation is, for instance, to prohibit students from leaving the school grounds during the school day [11, 31].

CMO3: When contextual factors (C) make staff feel that they are able to deal with students' responses (M), it may lead to staff members showing confidence for STP enforcement (O)

Staff commit to enforcement when they feel confident enough to intervene in student smoking [12, 22–26]. This level of confidence, in turn, depends considerably on the staff members' feelings about their ability—e.g. skills—to deal with the adolescents' responses. The characteristics of students influence the staff members' perceptions of their ability and thus confidence to enforce the STPs, as smoking students were sometimes perceived of as being dismissive of the staff members' authority or indifferent to the consequences of getting caught [49]. Staff were also discouraged from intervening if they expected the student might be threatening [11, 47]. In addition, sometimes the staff members' lack of familiarity with a student decreased their ability to strictly intervene in smoking: "the pupils' lives can be so complicated and me just coming in there and giving them a row for smoking might be so trivial compared to what's going on in their house" [11].

The staff members' own personal smoking habits may also decrease their ability—e.g. authority—to intervene in student smoking. Staff members who smoke may feel that they are not fully entitled to take action against student smoking, and students may use the staff member's smoking as an argument against enforcement [28, 29, 31].

At the national level, legislation compelling schools to implement STP strengthens staff's abilities to intervene in student smoking, because government rules stand as a backbone and give staff authority for enforcing with criticizing students [6, 29, 43]. Legislation may also indirectly decrease the students' negative responses, as legislation on smoking bans in society (e.g. restaurants, bars, workplaces) gradually de-normalize smoking, which may make staff intervening in student smoking acceptable and expected behaviour [24, 29, 51, 53, 59].

Discussion

The purpose of our realist review was to improve our understanding of why staff members in some schools enforce STPs more consistently than others by explicating how contextual factors at the individual, interpersonal, school, implementation, and national levels contribute to triggering school staff members' cognitive, psychosocial, and behavioural responses (mechanism), which may in turn influence their enforcement behaviour (outcome). We discovered three generative mechanisms, which we integrated into a programme theory.

CMO1: When contextual factors make staff experience STP as part of their professional role and duties, it may lead staff members' responsibility for STP enforcement. Key contextual factors that may trigger responsibility are the staff members' professional identity and values (e.g. they appreciate school health promotion) and perceptions that enforcement does not considerably burden them or negatively influence staff-student relationships.

CMO2: When contextual factors make staff perceive that their contribution is leading to positive outcomes, it may lead to staff's motivation for STP enforcement. Key contextual factors that may trigger motivation are the staff members' perception that schools can compensate for negative peer and family influences and their perception that all colleagues are doing their part and participating in enforcement.

CMO3: When contextual factors make staff feel that they are able to deal with students' responses, it may lead to staff's confidence for STP enforcement. Key contextual factors are the staff members' own smoking status, non-familiarity with students, and the expectation that students will respond aggressively. Although the programme theory presents the CMOs separately, they are interconnected, as the staff's responsibility (CMO1) and confidence in STP enforcement (CMO3) influence the consistency of all staff members in enforcing STPs. This further triggers the staff's outcome expectations and motivation for STP enforcement (CMO2).

This was the second realist review looking at how to facilitate staff members' implementation of health promotion policies/programmes in the school context. Pearson et al.'s [12] review showed how the implementation of programmes in schools could be supported by focusing on contextual factors at the school level. Our review extends this work by demonstrating that it is also important to examine and address the influence of contextual factors beyond the school level when aiming to understand and

improve the staff's implementation. The school is thus not the only stakeholder that should be held accountable for safeguarding the effective implementation of school health promotion policies/programmes.

Prior studies examining programme implementation in schools have pointed out that support from senior management is a key element in successful implementation, yet they did not explicate in detail why this is the case [12, 60]. Our results indicate that this support is important because the senior management plays a central role in developing the school culture, practices, and values that influence the staff's feeling of responsibility for enforcement (CMO1). Individual teachers or groups of teachers can act as champions for health promotion, but in a long run, they also need support from the senior management. Based on related literature in health care settings [61], we also expect that support from the senior management influences staff's expectations of a positive outcome (CMO2) and staff's feeling of confidence (CMO3). Senior management could, for instance, deal with students who disrespect an intervention by a staff member who is lower down in the hierarchy, therewith increasing staff's confidence to intervene.

A novel finding was the importance of staff members' collective STP enforcement for individual staff members' expectations of a positive outcome. Earlier research on STPs had already demonstrated that the consistency of staff members' enforcement influences the impact of STPs on adolescent smoking [7, 8, 10], and our results explain this by showing that colleagues who turn a blind eye to student smoking compromise other staff members' expectations of a positive outcome and consequently the motivation for enforcement (CMO2). This explanation fits with the normalization process theory [62], which underlines that the contribution of all staff is important for policies to become embedded in specific social contexts. Our results can also be reflected in the theoretical framework of schools as complex adaptive systems (CAS) [56] to highlight how each staff member's behaviour influences the school dynamics and vice versa.

Practical recommendations
The results show that staff members' positive outcomes may decrease if implementing and enforcing smoking bans on the school premises leads to smoking outside the school's boundaries and increased smoking visibility. A solution at the school level could be to prohibit students from leaving the grounds during school hours—that is, making the school hours a smoke-free time for all adolescents. However, one may question whether such a rule would not lead to adverse effects for the most vulnerable students. A more feasible solution may be to adopt a government policy that permits schools to enforce the smoking rules during school hours outside the areas that fall under schools' formal jurisdiction.

The results also demonstrate the significance of staff members' collective STP enforcement, highlighting the importance for schools to engage all staff members in the enforcement of STPs. There were many reasons explaining why individual staff members may not enforce the rules, but one important reason was that staff members question the impact of punitive sanctions for nicotine dependent students. Therefore, it is important for schools to find ways to support nicotine-dependent adolescents; otherwise, staff members will remain reluctant to enforce the rules, in turn, decreasing the overall impact of the STP [10].

Schools should be motivated not only to aim at promoting adolescents' academic outcomes, but also to contribute to the students' overall health and well-being. The results indicate that national policies have an important role to play in making staff members feel that STP enforcement—and health promotion more generally—is part of their professional role. Finland is an example of a country where national laws on education and health presume co-operation between sectors in the education and welfare activities of schools. A basic education law [63] also aims to promote student health and well-being and to develop a school culture that promotes both learning and well-being. Furthermore, a specific law [64] stipulates school and student welfare activities. The ability of schools to apply and integrate interventions and health promotion programmes in their basic activities in a way that generates permanent effects is nationally monitored on a regular basis [65].

Limitations and future research
The programme theory explains under what conditions staff members feel responsible, motivated, or confident (i.e. generative mechanisms) to enforce STPs. However, the main limitation is that the programme theory is unable to differentiate the relative influence of the contextual factors and generative mechanisms on actual staff members' enforcement behaviour. Such questions of relative influence are best addressed in future studies using quantitative methodologies.

Another limitation is that evidence on contextual factors at the school and intrapersonal levels was scarce. Future research should focus in more detail on these school and intrapersonal level factors, because they are likely easier to tackle by schools and local stakeholders compared to national-level factors. For instance, our results show that staff experience difficulties in enforcing STPs when they know students are addicted to nicotine, yet evidence on possible solutions to this problem remains absent.

Conclusions
By applying a realist approach, we have been able to detect three CMOs that explain school staff members' STP

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enforcement. We have extended the contemporary understanding of the complexity of implementation in the school context by thoroughly specifying how contextual factors at different levels (e.g. the individual, interpersonal, school, implementation, and national) may influence staff members' STP enforcement. The study offers insights for policymakers and stakeholders on how to support staff members' STP enforcement and thereby the effectiveness of STPs on adolescent smoking.

Additional files

Additional file 1: Search strategy. (DOCX 155 kb)

Additional file 2: Main characteristics of the included studies. (DOCX 36 kb)

Additional file 3: RAMESES publication standards: realist syntheses. (DOCX 15 kb)

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Facilitating conditions for staff's confidence to enforce school tobacco policies: Qualitative analysis from seven European cities

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Facilitating conditions for staff's confidence to enforce school tobacco policies: qualitative analysis from seven European cities

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Abstract

Background: School staff members' consistent enforcement of school tobacco policies (STPs) is needed to decrease adolescent smoking and exposure to tobacco smoke. Staff's confidence, indicating their perceived ability to cope with students' negative responses, explains variations in staff's STPs enforcement, yet understanding of the determinants for confidence is lacking. We analyzed the conditions in which the staff feel confident in addressing students who violate STPs to support staff's enforcement.

Methods: Data consists of 81 semi-structured interviews with the staff members from 26 secondary schools in seven European cities in Belgium, Finland, Germany, Ireland, Italy, The Netherlands, and Portugal. In every city, 3–4 staff members (senior management, teachers, supportive staff) in 3–4 schools (academic–vocational, high–low SES area) were interviewed. Transcripts were analyzed with thematic analysis.

Results: When staff felt confident in their ability to prevent, diminish, or handle students' negative responses, they were more likely to address students on STP violations. The staff was more confident (1) when consistent policy enforcement within school and regarding the wider society ensured staff legitimacy for STPs enforcement, (2) when dialog and mutual familiarity with students allowed the staff to facilitate constructive interaction with STP violators, and (3) when organizational backup structures provided staff collegial support to overcome challenges in the enforcement. These conditions would support consistent enforcement, especially with persistent misbehavers and among the more uncertain staff members.

Conclusions: Our study stresses the need to implement strategies at multiple levels to strengthen staff's confidence for STP enforcement. To support staff's legitimacy for enforcement, we suggest reinforcing structures and practices that facilitate consistency in STP enforcement; to support staff's ability for constructive interaction with STP violators, we suggest strengthening staff's social and emotional learning; and to support staff's experience of collegial support, we suggest reinforcing staff's collective ability to cope with students' negative responses.

Keywords: School tobacco policies, Smoke-free school policies, Implementation, Policy implementation, Tobacco prevention, Health promotion, Smoke-free school, Tobacco-free school, Tobacco-free environments

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Contributions to the literature

• The cross-country data generated and analyzed in this study allowed us to capture three conditions facilitating school staff's confidence to enforce school tobacco policies (STPs). These conditions consider the complexity of real-world policy implementation.

• Our study responds to the dearth of evidence on the determinants influencing school staff's enforcement of STPs, which is demonstrated to determine the effectiveness of STPs in decreasing adolescent smoking.

• Our findings allow us to provide multilevel strategies for schools and decision-makers to support staff's confidence and consistent enforcement of STPs towards tobacco-free schools.

Background

In 2021, Europe's Beating Cancer Plan set the goal of the Tobacco-free Generation in Europe by 2040 [1]. Tobacco prevention is key to achieve this goal. Preventive policies are integral to the provisions of the WHO Framework Convention of Tobacco Control (WHO FCTC), which aims to protect present and future generations from the various health, social, environmental, and economic consequences of tobacco consumption, nicotine addiction, and exposure to tobacco smoke [2]. Schools represent an important setting for preventive efforts, as most tobacco users worldwide start smoking between 15 and 20 [3]. Aligned with the WHO FCTC Article 8 on Protection from exposure to tobacco smoke [2], school tobacco policies (STPs) are widely implemented in European countries [4–6]. STPs describe where, when, and for whom the prohibitions against using tobacco products—cigarettes in this study primarily—apply and the consequences for violating the rules.

Despite the wide implementation of STPs, evidence of their effectiveness in decreasing adolescent smoking is inconclusive [7, 8]. Galanti et al. [8] published a systematic review aiming to explain why studies about the effectiveness of STPs report such varying findings. They concluded that scholars have too often overlooked the exact mode of implementation and identified various elements of implementation that seem important for STPs to be effective. One of these elements is consistent enforcement of the rules by school staff on adolescents who violate the STPs [8–12]. Later research explained that consistency is vital because inconsistencies may cause adolescents to use loopholes in the enforcement as opportunities to smoke, develop pro-smoking social meanings around breaking the rules, decrease adolescents' acceptance of the school authority over their

smoking, and perceive the sanctions associated with violating the smoking rules as unjust and applied in a biased fashion [13].

Linnansaari, Schreuders, Kunst, Rimpelä, and Lindfors [14] utilized a realist review to explain the variety in school staff members' enforcement of STPs, describing how the interconnections between STPs and contextual factors may explain staff's enforcement through cognitive and psychosocial processes called mechanisms. Linnansaari et al. [14] identified several mechanisms that explain how the differences in the staff's enforcement practices may originate. One mechanism is that some staff members may feel more confident than others in addressing students who violate the rules. This confidence depends considerably on staff members' perceived ability—such as skills and authority—to deal with adolescents' negative responses, like questioning the rules, showing disrespectful behavior, or refusing to comply with the staff's instructions [14].

In their review, Linnansaari et al. [14] further emphasized the role of contextual factors in a staff's confidence in STP enforcement, suggesting that specific factors at the societal, school, social, and individual may influence a staff's perceived ability. For instance, national legislation prohibiting smoking in public places and at schools generated a sound basis for STPs, increasing a staff's authority for enforcement, whereas a staff's smoking status undermined this authority by providing students a means to question their authority. The staff also experienced uncertainties when they were unfamiliar with the students or when students' characteristics prompted expectations of strong negative responses. However, Linnansaari et al. [14] stressed that limited empirical evidence shows which factors are important and how they may influence a staff's confidence in enforcing STPs.

The role of confidence in a school staff's behavior may also be reflected via knowledge of self-efficacy. Like confidence, self-efficacy indicates individuals' beliefs in their capability to carry out actions or tasks [15, 16]. A large amount of empirical evidence shows that self-efficacy is one key factor in predicting and explaining individuals' behavior [16]. Self-efficacy is also a core determinant in many behavioral theories [17], and essential for explaining teachers' practices (e.g., [18–20]). For instance, a recent systematic review showed that teachers with higher self-efficacy intervened in bullying more often than teachers with lower self-efficacy [21]. Four sources are demonstrated to influence self-efficacy: having successfully performed the task previously, learning vicariously from observing others' successful performances, being persuaded that one can perform the task, and reducing negative physiological and affective states associated with hesitation. However, little research has been

done to explain determinants for self-efficacy; thus, a comprehensive understanding of its development is still lacking [16].

Considering the context is important to understand the school staff members' confidence in STP enforcement and is a novel practice of real-world implementation studies characterized by complexity [22, 23]. We considered schools as Social Complex Adaptive Systems (SCAS), which aligns with Keshavarz [24]. SCAS indicates that the interactions among various adapting actors, such as senior management, teaching and supportive staff, students, and parents, fundamentally shapes the functioning of schools. These individual agents base their everyday actions on rules, including the formal organizational rules, such as school policies and guidelines, more abstract school ethos, and more general prevailing social norms and practices. Schools have some autonomy, yet they are also in a network of systems imposing multiple constraints. These external systems may be bigger than the school, such as the national education system, or smaller, such as families [24]. Understanding how a staff's confidence emerges in the interplay within and among these individual, social, organizational, and societal systems may facilitate designing implementation strategies that support staff's confidence.

We respond to the accounts of earlier research on the lack of evidence on determinants for staff's confidence in STP enforcement. We aim to empirically study the conditions in which the staff feel confident in their ability to cope with students' negative responses to STP enforcement. We consider the complexity of real-world policy implementation by recognizing and treating schools as SCAS, which indicates that we expect staff confidence to emerge in the interplay between various determinants at multiple levels. Our ultimate objective is to provide strategies for schools and decision-makers to support staff members' consistent STP enforcement towards tobacco-free schools. The research questions for the study are as follows:

1. What is the challenge of STPs enforcement? Why does confidence matter in STPs enforcement?
2. In which conditions does the school staff feel confident in their ability to cope with students' negative responses during STPs enforcement?

Methods

Our report follows the Standards for Reporting Qualitative Research (SRQR) [25] (Additional file 1). The study employs interview data generated with 81 school staff members in 26 secondary schools in seven European cities: Namur (Belgium), Tampere (Finland), Hanover (Germany), Dublin (Ireland), Latina (Italy), Amersfoort (the Netherlands), and Coimbra (Portugal). The study was conducted as part of SILNE-R research project "Enhancing the effectiveness of programs and strategies to prevent smoking by adolescents: a realist evaluation comparing seven European countries" that was funded by Horizon 2020 between October 2015 and October 2018 [26]. The countries in the study were included as they represent great diversity in the implementation of national tobacco control policies and strategies. Six of the seven countries/cities were included as they were already part of the SILNE school survey (2012–2013). Ireland was added to the original countries due to its advanced tobacco control. The included cities were all median-sized and close to the national average in terms of socioeconomic level and percentage of non-foreign population.

From each country, three to four schools that represent different school tracks (academic–vocational) or were situated in areas with distinct socioeconomic levels were included in the study. Schools were generally recruited by contacting senior management of those schools that had participated already in the SILNE school survey, by providing information on the study and asking for participation. Overall, schools were willing to participate. An overview of the schools' rules and countries' legislation is presented in Table 1.

Three to four interviews in every school were conducted. The interviewees represented varying professional positions, including senior management, teachers, and supportive staff (e.g., receptionists, janitors, educators). Interviewees were recruited by the senior management or other school contact person who had the ability to select staff from varying positions and with comprehensive knowledge of STP enforcement. An overview of the interviewees' country, school number, professional position, and age group, are presented in Additional file 2. This file also shows the code for each participant (e.g., BEL1S)—used in the "Results" section. The code indicates the participant's country (Belgium), school number [1], and professional position (supportive staff).

The interview topic guide (Additional file 3) was formulated in collaboration with the research teams from all countries participating in the SILNE-R research project [26]. The Finnish researchers (AL, PL) coordinated the collaboration. With a professional teaching background, AL was familiar with the school context. The topic guide was piloted twice in Finland, with minor adjustments. In each country, interviews were conducted by one to three junior researchers, Ph.D. candidates, and/or post-doc researchers with experience in qualitative research. A joint training session for researchers was organized in

Table 1 Overview of governmental law on STPs, student smoking, and school rules on smoking (modified from [27, 28])

Country	Government law in 2016: prohibition on students and staff smoking in schools	School	Student weekly smoking[a], %	STPs in 2016: which students are not officially prohibited from smoking during school hours, and where[b]
BEL	No smoking in the school buildings and on the premises	1	8.2	4th graders (avg. 15–16 years old) and above, outside the premises
		2	23	4th graders (avg. 15–16 years old) and above, outside the premises
		3	14.3	Any student with parental permission to leave for lunch, outside the premises
		4	6.2	4th graders (avg. 15–16 years old) and above with parental permission to leave for lunch, outside the premises
FIN	No smoking in the school buildings and on the premises	1	8.4	No smoking during school hours
		2	8.3	No smoking during school hours
		3	5.6	No smoking during school hours
		4	2.4	No smoking during school hours
GER	No smoking in the school buildings and on the premises	1	8.8	No smoking during school hours
		2	3.4	No smoking during school hours
		3	4.2	No smoking during school hours
IRL	No smoking in the school buildings and on the premises	1	1.8	No smoking while in school uniform
		2	4.9	No smoking while in school uniform
		3	2.6	No smoking while in school uniform
		4	8.9	No smoking while in school uniform
ITA	No smoking in the school buildings and on the premises	1	15.0	No smoking during school hours[c]
		2	26.5	No smoking during school hours
		3	10.8	Any student in a designated area on the premises
		4	44.6	No smoking during school hours
NDL	No smoking in the school buildings, except for ventilated "smoking rooms" (no prohibition on smoking on the premises)	1	6.6	3rd graders (avg. 14–15 years old) and above, outside the premises
		2	7.0	3rd graders (avg. 14–15 years old) and above, in a designated area on the premises
		3	21.5	3rd graders (avg. 14–15 years old) and above, outside the premises
		4	18.8	4th graders (avg. 15–16 years old) and above, in a designated area on the premises
POR	No smoking in the school buildings and on the premises	1	17.6	10th graders (avg. 15–16 years old) and above, outside the premises
		2	11.5	10th graders (avg. 15–16 years old) and above, outside the premises
		3	10.4	10th graders (avg. 15–16 years old) and above, outside the premises

[a] Questionnaires were completed by adolescents at school in the two grades enrolling students 14–16 years of age

[b] Detailed data on staff smoking bans in different schools are unavailable

[c] In Latina (ITA), most schools have comprehensive official rules, but their actual implementation is problematic. One school deliberately chose not to follow the law prohibiting smoking on the school premises

Germany in autumn 2017 to establish a common understanding of the study protocol.

Interviews were conducted from end-2016 to mid-2017. The school staff members were provided information about the research and procedure before signing a written informed consent form (Additional file 4) and participating in the interviews. The interviews lasted approximately between 20 and 60 min. All interviews were audio-recorded, transcribed verbatim, translated into English, and sent to Finland for analysis. Pseudonyms were used in the transcripts, and no information that would clearly identify participants was included. Three transcripts from two schools in Germany were excluded, as we set the minimum number of transcripts per school at three. Interviewers also provided fieldnotes

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that included reflections on the interviews and descriptions of schools (Additional file 5).

The interviews were analyzed using thematic analysis-a method for developing, analyzing, and interpreting patterns across qualitative data sets. The analytical process consists of systematically coding data to develop themes. The themes constitute the results of the analysis and are understood as patterns of shared meaning across the dataset [29, 30]. The analytical process was iterative: First, AL familiarized herself with the whole dataset to gain a deep overall and context-specific understanding of the data, gaining confidence as an emerging pattern that explain staff's STP enforcement. Next, AL coded all parts of the data relating to staff confidence. The NVivo program was utilized to organize the coding. AL then re-coded this dataset to analyze the determinants for staff confidence and connections between confidence and enforcement. Finally, AL synthesized the emerging patterns explaining staff confidence in STP enforcement into three themes (here conditions), then compared these themes with the initial dataset on confidence to ensure consistency in the interpretations.

The iterative analysis involved several discussions between AL and MS to reach a consensus on the interpretations. PL and AEK reflected on and agreed to the final considerations. The three conditions (i.e., themes) were detected across the dataset, namely in all seven countries and in all or most schools. Yet, some aspects or nuances within the conditions may be more dominant in some countries or schools than others. If a particular nuance or aspect was mentioned only in one country, it is specifically mentioned in the "Results" section.

Results

The challenge of STP enforcement

The staff demonstrate that an ongoing battle for power between staff and students exists. This struggle continuously manifests in students testing the boundaries of school rules, whether breaking a rule on smoking, using phones, wearing hats during class, or littering, and so forth. Testing boundaries was described as *common pupil behavior*. When the staff intervene in students' rule violations, students often show negative responses, such as complaining, questioning, disregarding staff's instructions, or saying rude things. These negative responses made enforcement challenging for the staff. *Interviewee: It's a kind of fear of whether they're going to talk back—of what they're going to do. Researcher: Do they talk back? Interviewee: Of course, they're going to talk back* (NLD2S). Staff's expectations concerning their ability to cope with students' negative responses influenced their intervening in rule violations. When the staff felt confident in preventing, diminishing, or handling students' responses,

they were likelier to intervene, whereas when the staff felt uncertain, they were likelier to ignore the violations.

Overall, rule violations were considered most common among students facing a combination of problems related to, for instance, life management skills, academic performance, and smoking addiction. Most staff considered enforcement with these persistent misbehavers challenging as they tended to respond strongly when addressed for violations. *Most of them (students) immediately understand they have done something stupid, but there have also been people who couldn't care less* (FIN3M). All staff may struggle with enforcement, especially with the persistent misbehavers. However, due to certain characteristics, such as a lack of intrinsic authority, some staff members were generally less confident in addressing students about violations. *Some teachers absolutely have no problem going over and lifting them (students) out of it [i.e., giving it out to them for smoking] — your personality is such a huge part of it* (IRL2T1). A lack of professional experience also played a role. Having more professional experience was reflected to decrease a staff's sensitivity to students' negative responses and provide better skills to handle the discussion with students. *It is just part of a teacher's self-development. — If teachers just started teaching, you cannot expect them to function adequately on everything... It just needs time* (NLD1T). Students were stated as being aware of the staff members most likely to ignore violations. Thus, the staff who struggle the most may also encounter more situations that entail addressing students.

Conditions facilitating staff's confidence to enforce STPs (see Fig. 1).

Condition 1: Consistent policy enforcement within the school and regarding the wider society ensures legitimacy for staff's STP enforcement

Governmental legislation sets the minimum requirements for STPs, and thus most of the schools prohibited smoking on the indoor and outdoor premises of the school (Table 1). Clear STPs, underpinned by governmental legislation, supported staff members' legitimacy for STP enforcement and provided an argument for discussions. *Yes, I have also personally shown [governmental law on STPs] to a student — That pretty much ends the discussion — They know this is how it is* (FIN2M). Also, smoking bans in public places (e.g., cafes, restaurants, shopping malls, public transport) were considered to support students' acceptance for STPs, whereas negative responses were more common if the school environment was more restrictive than the wider society.

Consistent rule enforcement among all staff members, meaning no one ignored STP violations, was

considered critical for a staff's legitimacy to enforce the rules, as inconsistency allowed students to contest them. *If there are two or three teachers who deviate from that (enforcing the rule), then you can be 100% sure there will be a student who says, 'Well, this other teacher allows it.' As a result, you won't be able to enforce the rule* (NLD1M2). The staff indicated that persistent misbehavers were especially prone to use inconsistencies in enforcement to their advantage. Nevertheless, enforcement also with these students was considered important to ensure consistency. *If you start making exceptions, that's the end (because then students say) 'Ah, but you said OK for X.' Then you can no longer justify it, and the rule isn't worth anything anymore* (BEL1S).

Staff's abstinence from smoking was reported important to ensure an individual's and a whole staff's legitimacy to enforce STPs and promote a tobacco-free life—an aim often integrated into the STPs. Staff smoking was considered to undermine legitimacy also when it adhered to STPs but was still witnessed by students. *I don't know what is less educational than when it (smoking) is forbidden inside the school, whatever the space, and then the person (staff member) goes along with the students to smoke outside the gate, in front of the students – the pedagogy of the example, I believe that it is fundamental* (POR2M). Staff's abstinence from smoking supported staff's confidence by preventing students' the opportunity to question the rules: *You don't give the young boys the opportunity to say, 'How come you can smoke but I can't'?* (ITA4T2).

Condition 2: Familiarity and dialog allow staff to build up constructive interaction with students during the enforcement

When the staff addressed students for rule violations, they often preferred to build a dialog with students to *change the behavior as opposed to just punishing them* (IRL2T2). Compared to the punitive approach, such as issuing detention, dialog was experienced to decrease students' need to defend their actions with negative responses and engage adolescents in constructive interaction. Sometimes, dialog was even integrated into the official consequences for rule violations, like the case of Finnish *educational conversations*, which followed a specific procedure: *We fetch them (students), go over the note (STPs violation), and then have a discussion about it. After that, we have the child call home, after which I talk to the guardian* (FIN1T2). Involving parents was stated as necessary as parental approval for smoking was reported to increase students' opposition to the STPs.

A positive relationship or certain familiarity with students allowed the staff to predict students' responses and

diminish the negative ones by shaping the dialog according to *the hierarchy of the problems in each young person's life and behavior* (FIN2M). Staff stated that always looking at *the child behind the behavior* is important (NLD2S), which familiarity made easier. In contrary, intervening in unfamiliar students' rule violations was often experienced as problematic. *I sometimes find it (intervening) a bit difficult, especially if you don't know the student* (GER3T3).

In countries where supportive staff members, specifically educators, were integrated into the school staff structure, teachers' and educators' duties were often differentiated in a way which supported educators' better familiarity and relationships with students. *They (educators) know many things we (teachers) don't know about the students. However, it's also their part (duty) to have a certain familiarity with students, which is a privilege. We aim for that in this school. We aim to have students be able to tell their problems* (BEL1T). Familiarity was said to work both ways, as staff stated that students were less likely to contest staff members with whom they were familiar and, for instance, knew to be strict. *If you've had contact with a pupil, they know who you are. They listen better. Otherwise, they look at you and think, 'Who the hell are you? It's nice what you're saying, but I'm turning around now'* (NLD1T).

Condition 3: Organizational backup structures provide staff members collegial support to overcome challenges in the STP enforcement

Collegial support was reported especially important for the staff who were naturally less confident in addressing students about rule violations. *The only thing you can do for the people who really find it difficult to do that (address students) is to make sure it becomes easier; the only way to do that is to have a team of teachers who collectively comes into action* (NLD1M1). Senior management was indicated to play a critical role in building mutual trust and open discussion among staff—a requirement for considering the individual uncertainties.

Some schools had considered the individual uncertainties by dividing the enforcement tasks to prevent staff from ignoring the rule violations in challenging situations. For instance, in one school, the staff were not required to address students personally, yet everyone was obligated to monitor and report violations to a specific *list*. Dialog with the students was then conducted by staff with the most jurisdiction (e.g., senior management, section head) or suitable characteristics (e.g., long professional experience) to cope with students' negative responses. *The educational conversation group takes care of these sorts of behavioral things. An excellent team (two teachers mentioned by name) and I have been doing this*

Fig. 1 Facilitating conditions for staff's confidence to enforce school tobacco policies (STPs) structured in line with schools as Social Complex Adaptive Systems (SCAS)
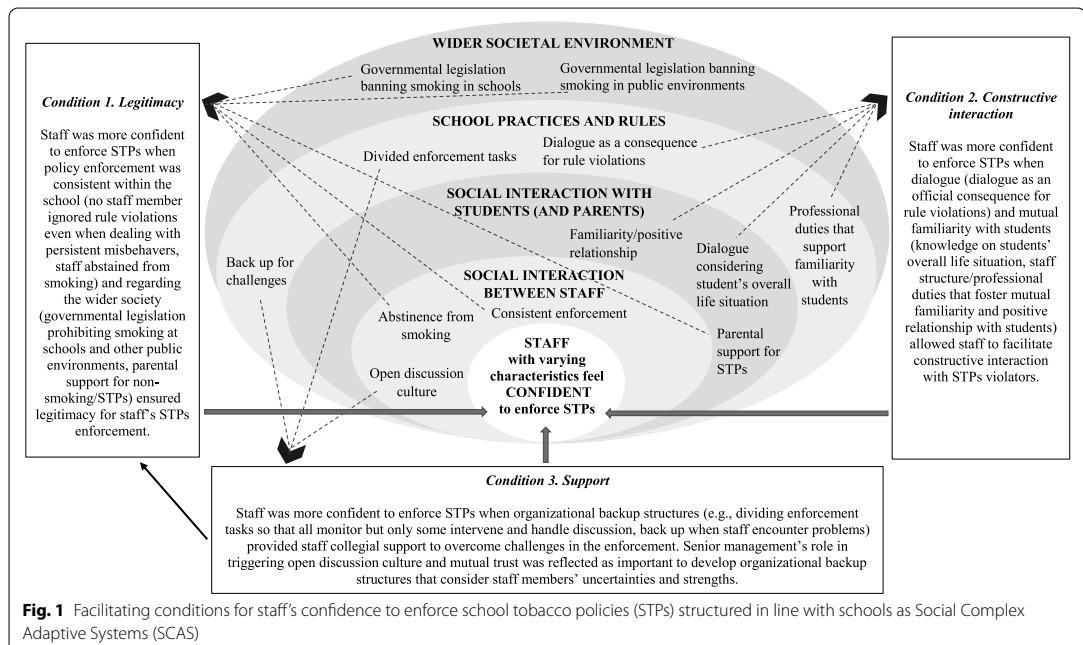
for a long time. We all have very long careers and a lot of experience. We know what is going on, and we handle these things. And it does work quite well (FIN1T2).

Even when addressing students for rule violations was indicated to all staff members, it was common to direct the challenging cases, such as repeated violations or notably rude behavior, to specific staff members—mainly senior management. This organizational backup structure ensured that staff would not be left alone with challenges, encouraging them to also enforce when expecting strong responses from students. *Interviewee: So, in that sense, I feel supported. I know when I find something difficult, I can always rely on someone (e.g., section head) who can deal with the pupils in a different way. Researcher: Do you think that pupils' knowledge of this increases your authority? Interviewee: Yes, the 'section head' is something big for them* (NLD1T). According to staff reflections, the backup structure also quells students' courage to contest the rules and deter them from progressively bad behavior.

Discussion
Summary of the findings
When the staff were confident that they could prevent, diminish, or deal with students' negative responses, they were likelier to address students on STP violations. However, when the staff were uncertain, they were more prone to ignore violations. This process was not only characteristic of enforcing STPs but also other rules, such as prohibiting mobile phone usage, wearing hats during class, and littering. We discovered three conditions that facilitate staff's confidence to enforce STPs. Staff seemed more confident when (1) consistency in policy enforcement within school and regarding the wider society ensured staff legitimacy for STP enforcement, (2) mutual familiarity and dialog allowed staff to build up constructive interaction with students during the enforcement, and (3) organizational backup structures provided staff collegial support to overcome challenges in the enforcement. The three conditions are summarized in Figure 1 in line with schools as Social Complex Adaptive Systems (SCAS).

All staff may feel uncertain about enforcing STPs, especially with persistent misbehavers, yet some staff members were generally less confident in enforcing them. Facilitating conditions strengthened the consistency of staff's practices by supporting enforcement especially with the persistent misbehavers and among the more uncertain staff members. As the conditions were positioned in somewhat distinct phases of the enforcement continuum, all conditions were important to ensure staff's confidence: legitimacy (conditions 1) to prevent students' negative responses, constructive interaction (condition 2) to handle the emerging negative responses,

and support (condition 3) to cope with students' strong responses with help from colleagues.

Limitations

Data collection included the participation of multiple interviewers to ensure the interviews were held in each country's native language. Despite the collectively agreed-upon topic guide and joint training session, the level that staff were probed to elaborate on their experiences and perceptions varied across the interviews. Therefore, we could have discovered more details or nuances within the three conditions if all interviewers had comprehensively discussed the meaning of confidence in STP enforcement with the interviewees. Also, translating the data from the original languages to English may have affected the level of details and nuances in some of the transcripts. However, given the large number of interviews from various schools in different countries and the similar patterns detected across the dataset, we believe we produced a consistent and comprehensive understanding of the conditions facilitating a staff's confidence in enforcing STPs. The trustworthiness of these interpretations is strengthened by close collaboration between two researchers from different countries during the analysis. However, a contribution to the analysis from all participating countries would have further strengthened the considerations.

Interpretations of the results and practical implications

Aligning with schools as SCAS [24], our findings demonstrate that confidence to enforce STPs among staff with varying characteristics emerges in interactions with other actors, school ethos, organizational practices, and the broader tobacco control environment. Next, we focus on interpreting the results and providing multilevel strategies to strengthen the conditions facilitating staff's ability to cope with students' negative responses. Strengthening the conditions may support staff's enforcement also by diminishing students' negative reactions, as our findings suggest these conditions increase students' acceptance of STPs (condition 1), reduce their need to defend themselves with negative responses (condition 2), and decrease their courage to contest (condition 3).

Earlier research has demonstrated that consistent enforcement among the staff is critical to ensure STPs' effectiveness in decreasing adolescent smoking [8, 9, 13]. Our results show that consistent enforcement was both a cause and an effect of staff's confidence: Consistent enforcement legitimized staff's authority to enforce STPs and prevented opportunities for students to question that authority (condition 1). Our findings further demonstrate that all staff members need not have similar enforcement tasks to ensure this consistency. Instead, a staff with varying confidence levels may contribute to consistency in

distinct ways. For example, monitoring and reporting the violations instead of ignoring them was critical among the more uncertain staff. In contrast, the more confident the staff could make participation easier for others by handling the discussions or providing backup for the more challenging situations (condition 3).

Aligned with the previous interpretations, we suggest that instead of targeting staff members' abilities one by one, focusing on strengthening structures and practices that support a staff's collective ability in STP enforcement (e.g., dividing enforcement tasks, implementing backup structures) could provide a more feasible way to ensure confidence and consistent enforcement. This argument is supported also by the knowledge of self-efficacy. Self-efficacy can be collectively assessed when referring to an individual's expectations that a group can act effectively together. High perceived self-efficacy is shown to explain participants' actions regardless of whether the self-efficacy is achieved individually or collectively [31]. Sørlie and Torsheim [32] have also demonstrated the association between increased teacher collective efficacy and decreased student misconduct. Earlier research emphasizes senior management's important role in building this collective efficacy [33–35], thus, aligning with our findings.

Strengthening adolescents' social and emotional learning (SEL) to enhance positive social behavior, academic achievements, and less misbehavior [36–39] has stood out in educational discussions during the past years [40, 41], yet school staff's SEL has remained marginal, despite staff having a fundamental role in modeling these competencies to students. SEL consists of five core social and emotional competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making [42]. According to our findings, staff members differ in their SEL, namely their skills and level of comfort in carrying out dialog and building constructive interaction and positive connections with students. Therefore, strengthening a staff's SEL could support their ability to build up positive relationships, carry out discussions, and solve conflicts with students, increasing their confidence in addressing students who violate STPs. A recent study by Schreuders et al. [27] demonstrated that students who keep violating STPs often have multiple life challenges, making enforcement with this group a complex balancing act with numerous aims. Our findings add to this determination by showing that strong negative responses among these students challenge a staff's confidence. Strengthening a staff's SEL could increase staff's ability to cope, especially with this group of students. Moreover, modeling a staff's SEL could particularly benefit these adolescents.

Finally, aligning with earlier research [3, 14, 43–45], we suggest strengthening national tobacco control especially on tobacco-free environments (WHO FCTC Article 8). Our findings demonstrate that staff's legitimacy for STP enforcement and students' ability to question the rules strongly intertwine with the broader tobacco control environment and STPs being integrated into the governmental legislation. Strengthening tobacco-free environments nationally could further assist schools in adopting and implementing more comprehensive tobacco policies towards tobacco-free schools. For instance, Hjort, Schreuders, Rasmussen, and Klinker [46] demonstrated in their study that believing that society and workplaces are becoming more smoke-free increased organizational readiness to implement smoke-free school hours (SFSH) in Danish vocational schools. SFSH extends STPs to whole school hours and all tobacco products.

Conclusions

Our study provided an in-depth understanding of the conditions facilitating staff's confidence in enforcing STPs. Our results stress the need to implement strategies at multiple levels to support staff's confidence and consistent STP enforcement towards tobacco-free schools. Our findings emphasize especially the need to consider the social context when implementing STPs. To support staff's legitimacy for enforcement (condition 1), we suggest reinforcing national tobacco control and school practices that facilitate consistent STP enforcement; to support staff's ability for constructive interaction with STP violators (condition 2), we suggest strengthening staff's social and emotional learning; and to support staff's experience of collegial support (condition 3), we suggest reinforcing staff's collective ability to cope with students' negative responses.

Abbreviations

STPs: School tobacco policies; WHO FCTC: World Health Organization's Framework Convention of Tobacco Control; SCAS: Social Complex Adaptive Systems; SEL: Social and emotional learning; SFSH: Smoke-free school hours.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s43058-022-00362-7.

Additional file 1. Reporting standards.

Additional file 2. Overview of interviewees.

Additional file 3. English interview guide.

Additional file 4. Information letter and informed consent form.

Additional file 5. Field notes.

Authors' contributions

PL and AL coordinated the development of the topic guide. AL, MS, and several researchers from the SILNE-R team (NM, MM, LH, SK, EB, DM, AM, and TL) contributed to the data collection in their countries. AL analyzed the data in close collaboration with MS. The final versions of the manuscript were read and approved PL and AEK. From each SILNE-R country, either work package leader (AEK, VL, AR, MR, LC, BF) or researcher with a key role in the school staff interviews (TL) read and accepted the final manuscript.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to qualitative data's highly sensitive and identifiable nature.

Declarations

Ethics approval and consent to participate

School staff members were provided information about the research and procedure before signing a written informed consent form (Additional file 4) and participating in the interviews. Ethical approval for the research was obtained separately for each city to comply with the national standards.

Belgium: REF 2012/09OCT/461 N° enregistrement belge B403201215182—Comité d'éthique Hospitalo-Facultaire des Cliniques Universitaires Saint-Luc.

Germany: Ethical approval MLU Halle-Wittenberg: 2016–90 hm-bü. Supervisory school authority, Hannover: H 1 R b—81402—55—2016. Supervisory school authority Lüneburg (Celle): LG 1 R.22—503000.

Portugal: General Directorate for education, approval number 0338600002 on 26 July 2016.

The Netherlands: Medical Research Involving Human Subjects Act (WMO): reference number W16_252 # 16.297, 11 August 2016.

Ireland: Research Ethics Committee–Dublin Institute of Technology: Ethical Clearance Ref 15–105, 16 June 2016.

Finland: Ethics Committee of the Tampere Region, Statement 29/2016.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Why staff at European schools abstain from enforcing smoke-free policies on persistent violators

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Why staff at European schools abstain from enforcing smoke-free policies on persistent violators

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Summary

Secondary schools in European countries increasingly implement comprehensive smoke-free school policies (SFSPs) that prohibit most or even all adolescents from smoking during school hours. Consistent enforcement of SFSPs is essential for realizing optimum effectiveness. A main challenge represents adolescents who persistently violate the rules. We studied how staff in European countries respond to these persistent violators and why they may turn a blind eye. We used interview transcripts from 69 staff members at 22 schools in 6 European countries to identify cases in which staff turned a blind eye. We then applied thematic analysis for identifying the considerations as to why they turn a blind eye. Turning a blind eye on persistent violators happened among school staff in all six countries. Three considerations were identified. First, staff believe their primary role and duty is to support all adolescents to develop into well-functioning adults, and sometimes it is best to accept smoking. Second, staff expect that applying stricter disciplinary measures will not stop persistent violators and is more likely to create more severe problems. Third, staff do not feel supported by relevant actors in society (e.g. parents) in influencing adolescent smoking. We conclude that staff's considerations stress the need to support school staff in enforcing the increasingly comprehensive rules on the most persistent smokers.

Key words: adolescents, school, smoke-free, implementation

INTRODUCTION

Adolescent smoking in European countries is on decline yet remains a major public health issue (Kuipers *et al.*, 2014; Salonna *et al.*, 2017; Marcon *et al.*, 2018). Many European governments therefore require schools to implement smoke-free school policies (SFSPs) that go

beyond the traditional aim to provide non-smoking adolescents a smoke-free environment. The implementation of increasingly comprehensive SFSPs aims to contribute to decreasing adolescent smoking behaviour. Schools in most European countries nowadays allow smoking only outside the premises and only by older adolescents,

whereas schools in some countries even prohibit all adolescents from smoking during school hours.

While the adoption of SFSPs by governments is important (Rozema *et al.*, 2016; Linnansaari *et al.*, 2019), such top-down rules only become part of adolescents' school life if these are consistently enforced by school staff. Consistent enforcement is a crucial requisite for realizing SFSP's optimum effectiveness on the collective of adolescents (Wakefield *et al.*, 2000; Galanti *et al.*, 2014; Schreuders *et al.*, 2017), because adolescents may (i) interpret staff's inconsistent enforcement as a sign that health risks of smoking are not so serious (Clark *et al.*, 2002; Baillie *et al.*, 2007), (ii) believe consequences are applied in unfair and biased fashions (Booth-Butterfield *et al.*, 2000; Gittelsohn *et al.*, 2001; Clark *et al.*, 2002) and (iii) abuse staff's leniency in attempts to gradually weaken the rules (Turner and Gordon, 2004). In real life, however, inconsistent enforcement is the rule rather than the exception (Baillie *et al.*, 2011; T. Leão *et al.*, 2019). A recently published realist review explaining staff's variation in enforcement showed that they may rather abstain from enforcing SFSPs (i.e. turn a blind eye) when the disciplining of a rule violator is—for whatever reason—thought to make no difference or do more harm than good (Linnansaari *et al.*, 2019).

Studies exploring staff's views on SFSPs enforcement showed they generally are reluctant to use disciplinary measures, because they believe it may harm the staff–student relationship and the welfare of students who face other difficulties (Gordon and Turner, 2003; Baillie *et al.*, 2009; Robertson and Marsh, 2015). They instead prefer, what they themselves call, 'supportive', 'tolerant', 'holistic' or 'low key' approaches for SFSPs enforcement that build on the assumption of voluntary compliance to the rules. This preference, however, leads to a dilemma when adolescents, like those with a nicotine addiction (Soteriades *et al.*, 2003), show no such voluntary compliance and keep on violating the smoking rules despite repeated warnings and/or disciplinary measures: staff members will be forced to choose between turning a blind eye and using stricter disciplinary measures, including suspension or even expulsion (Baillie *et al.*, 2009).

There exists, however, scant evidence demonstrating *in which circumstances* staff in European countries turn a blind eye on adolescents who keep on violating the rules, and *what considerations* underlie their choice when they turn a blind eye on such persistent violators. Studying these gaps in evidence is important for two reasons. First, studying *in which circumstances* staff turn a blind eye may inform us about when it particularly happens and how pressing the issue it. If we find that staff's turning a blind eye occurs systematically (versus some deviant staff members) and in most schools that implement comprehensive SFSPs, there likely exist good reasons for prioritizing efforts aiming to improve staff's enforcement on persistent violators. Second, studying *what considerations* underlie staff's choice to turn a blind eye may provide insights on how to improve staff's enforcement on persistent smokers. Prior studies offered some reasons explaining staff's reluctance to use disciplinary measures, but these reasons are insufficient to understand staff's acceptance of adolescents who deliberately and repeatedly disregard school rules on smoking. For instance, we know that staff are concerned about adolescents' welfare and staff–student relationships, but why precisely are these valid justifications for turning a blind eye?

The aim of our study was to address the abovementioned gaps in evidence, by analysing interviews that were conducted with 69 staff working at 22 secondary schools in 6 European countries. The use of data from multiple countries and schools allowed us to compare between contexts with varying SFSPs and smoking rates.

MATERIALS

This study was part of the European Union funded SILNE-R project, which aims to develop insights for enhancing the impact of common tobacco control measures on youth smoking (http://silne-r.ensp.org/). SILNE-R researchers, inter alia, performed interviews with school staff in seven European cities/countries: Namur (Belgium), Tampere (Finland), Hannover (Germany), Dublin (Ireland), Latina (Italy), Amersfoort (the Netherlands) and Coimbra (Portugal). These cities were chosen as they reflect the respective national averages in terms of demography, unemployment rate, income and proportion of migrants (Lorant *et al.*, 2015).

Sampling

From end-2016 to mid-2017, 84 staff members at 28 secondary schools in 7 European countries were interviewed in the native language. In each country, interviews were held by one to three junior researchers, PhD-candidates and/or postdoc researchers trained in qualitative research. Schools that participated in the SILNE project (2012–15), when only quantitative survey data were collected, were contacted to ask for re-participation in the more comprehensive SILNE-R project (2015–18). The goal was to conduct interviews at four schools per country, from the larger sample of schools participating in the SILNE-R project. We purposefully approached schools enrolling adolescents

Table 1: Overview of the schools and their characteristics

Country	School	Student weekly smoking, %	Which students are not *officially* prohibited from smoking during school hours?
NLD[a]	1	6.6	3rd graders and above, outside the premises
NLD	2	7.0	3rd graders and above, in a designated area
NLD	3	21.5	3rd graders and above, outside the premises
NLD	4	18.8	4th graders and above, in a designated area
FIN	1	8.4	No smoking during school hours
FIN	2	8.3	No smoking during school hours
FIN	3	5.6	No smoking during school hours
FIN	4	2.4	No smoking during school hours
GER	1	8.8	No smoking during school hours
GER	2	3.4	No smoking during school hours
GER	3	4.2	No smoking during school hours
POR[b]	1	17.6	10th graders and above, outside the premises
POR	2	11.5	10th graders and above, outside the premises
POR	3	10.4	10th graders and above, outside the premises
BEL[a]	1	8.2	4th graders and above, outside the premises
BEL	2	23.0	4th graders and above, outside the premises
BEL	3	14.3	Any student with parental permission to leave for lunch, outside the premises
BEL	4	6.2	4th graders and above with parental permission to leave for lunch, outside the premises
IRL	1	1.8	No smoking while in school uniform
IRL	2	4.9	No smoking while in school uniform
IRL	3	2.6	No smoking while in school uniform
IRL	4	8.9	No smoking while in school uniform

[a]In Belgium and the Netherlands, the 3rd graders are ∼14–15 years of age and 4th graders 15–16 years of age.
[b]In Portugal, 10th graders are ∼15–16 years of age.

with a relatively low or relatively high socio-economic status (SES), ideally resulting in the participation of two low SES and two high SES schools. Most of the schools that we approached agreed to participate in the staff interviews. The goal was to perform at least three interviews per school, ideally recruiting at least one staff member with the following functions: a (vice) principal or someone from senior management, a teacher and, if existent in the respective school system, someone in a supportive role (e.g. janitor, educator, receptionist, health professional). This selection of staff with different functions allowed us to explore the implementation of SFSPs from multiple perspectives.

We excluded 12 transcripts from 4 schools in Italy due to insufficient information on the topic. We also excluded three transcripts from two schools in Germany, because we set the minimum number of transcripts per school for inclusion at three. The final sample was 69 staff members at 22 schools in 6 countries.

Table 1 presents information about the schools, including their country, weekly smoking prevalence, number of students and formal rules on adolescent smoking.

Supplementary File S1 presents the characteristics of the individual staff members, including information about their school number, country, age, gender, function and smoking status. This Supplementary File also shows each interviewee's code (e.g. BEL1M) as used in the 'Results' section.

Data collection

The interviews followed a semi-structured interview guide (Supplementary File S2). This guide was developed in collaboration with SILNE-R researchers from all participating countries to ensure that the guide was fit for each national context. Prior to data collection, all interviewers attended a joint training session to establish common understanding and harmonize the procedures.

The interviews took place in a quiet room in the school, lasted between ∼20 and 60 min, and were done in the country's native language. Before the interview

started, the interviewer explained the purpose of the interview and participants' right to confidentiality in scientific research, and asked them for their (written) consent and approval for voice-recording the interview. The interview started by asking staff members to tell something about the school, their tasks in the school and how long they have been working for the school. Then, participants were asked about the current rules that apply to smoking, the adoption process that led to the current rules, as well as their experiences with the enforcement of the rules. The interviewer probed staff members to explain the issues that they and their colleagues experience during the enforcement of SFSPs, including why some staff members are stricter during enforcement than others, what they do when an adolescent keeps violating the rules, and why they choose or do not choose to turn a blind eye. The interview ended with the question what staff members think the school needs to become able to become smoke-free in the future. The participants were afterwards asked to fill out a short questionnaire about their age, gender, position in school and current smoking status.

All interviews were transcribed verbatim and translated into English. Interviewers were instructed to write reflexive field notes, including information about the country-specific educational system as well as any observation they made during data collection at the schools.

Data analysis

All interview transcripts were uploaded in MaxQDA12 to facilitate the systematic organization and coding of the qualitative data. MS and AL applied the principles of inductive thematic analysis (Braun and Clarke, 2006), meaning that we did not use any *a priori* theories or themes, but instead built solely on staff's experiences and accounts, as expressed by themselves in the interviews. MS and AL started with reading all transcripts to familiarize themselves with the data and identify patterns and phenomena. This led us to focus on staff's tendency to turn a blind eye on persistent rule violators—that is, adolescents who show no voluntary compliance and keep on violating the smoking rules, even if they were subjected to repeated warnings and/or disciplinary measures. The precise coding involved three steps. First, MS and AL re-read the transcripts, and during this reading identified cases in which staff described they turned a blind eye on persistent violators and coded any part of the text that seemed relevant for understanding why staff may choose to turn a blind eye on persistent violators. Second, MS and AL analysed for themes throughout the coded parts of text, and repeatedly discussed this step of analysis to refine and

find agreement on the themes. Third, MS and AL contrasted, combined and selected the relevant themes into coherent considerations that helped explain why staff may choose to turn a blind eye on persistent violators. The last two steps involved repeated discussions with other co-authors to review the considerations in perspective of the original data and reach consensus on the final considerations.

RESULTS

In which circumstances staff choose to turn a blind eye

Staff members generally described the implementation of SFSPs as a continuous balancing act between numerous interests. This balancing act could result in the shared decision, among colleagues at multiple levels in school's hierarchy, to turn a blind eye on persistent violators, which they justified as the least bad option. Turning a blind eye, however, did not mean that certain groups of adolescents were *a priori* exempted from disciplinary measures, but rather that after several warnings and disciplinary measures, which already cause most adolescents to stop violating the rules, the choice was made to make exemptions for these persistent rule violators. Staff argued this choice to make rule exemptions did not harm the interests of other adolescents all too much, because persistent rule violators were allowed to smoke only at places where they did not bother non-smokers and were not in full sight of particularly the younger adolescents.

SFSP's comprehensiveness within a school strongly connected to how often staff turned a blind eye. Staff in most Finnish, German and Irish schools, that basically prohibited any smoking during school hours in and outside the premises, frequently turned a blind eye on persistent smokers. They mostly knew, suspected or even saw that some adolescents were violating the rules on a daily basis by smoking at hidden locations in the premises or further away from the premises, but chose not to connect these violations to disciplinary measures.

> There are always kids who smoke [*during school hours*]. So of course, there is always a smokers' corner somewhere. Basically, everyone knows [*where it is*], but no one goes there, except for the students of course. And the colleagues here are pretty discrete [*do nothing about it*] (…) It's basically against the rules because it means leaving the school grounds. Nevertheless, at recess, especially the older students go there.
>
> (GER3T4)

Staff in most Belgian, Dutch and Portuguese schools, that basically allowed adolescents from a specific grade

onwards to smoke either in or outside the premises, less frequently turned a blind eye on persistent smokers who did not follow the rules. This largely was the consequence of rules that allowed older adolescents to smoke at designated smoker areas in the premises or outside the premises, and so most smokers simply went to these areas. However, staff could still make exemptions for some specific (groups of) younger adolescents whom officially were not allowed to smoke, but in most schools this did not happen all too often.

> Sometimes, in some more complicated situations, if these are kids with a strong habit, the staff member responsible for the gate stays beside him, he goes outside the gate, outside the school gate and smokes his cigarette there. A 'lesser evil', I think.
>
> (POR1M2)

It is important to put the frequency at which staff turn a blind eye on persistent smokers in perspective of schools' smoking prevalence. Table 1 shows that, on average, schools prohibiting any smoking during school hours (i.e. Finland, Germany and Ireland) have a lower weekly smoking prevalence than schools allowing older adolescents to smoke (i.e. Belgium, the Netherlands, Portugal). Without inferring any causality, it thus seemed that more comprehensive rules connected with a lower smoking prevalence and also with more *in*consistency in staff's enforcement.

Why staff choose to turn a blind eye

The next sections will discuss three considerations explaining why staff choose to turn a blind eye on persistent violators. These considerations are not mutually exclusive, but instead commonly co-occurred in staff's reasoning. All three considerations were found among staff in all countries, notwithstanding that some considerations seemed more dominant in one country than the other.

Staff's primary role is supporting all adolescents to develop into well-functioning adults

Staff argued that over time, government legislation on tobacco control has become increasingly strict and that social norms have become more anti-smoking. This societal change has led to a considerable decrease in the number of adolescents whom staff see smoking during school hours, but concurrently they noticed there is a disadvantaged and marginalized group that did not keep up with this societal change. Those adolescents who nowadays persistently violate the SFSPs during school hours were reasoned to mainly be the most vulnerable adolescents: they tend to come from lower socioeconomic families and neighbourhoods, face a combination of problems, hardly care about their academic achievement and/or live with parents who fail to provide the guidance that adolescents need in this self-exploratory and experimental phase of life.

> [*Back when the interviewee started working at school*] I would say probably 5-10%, and most amongst the seniors, and across a number of socioeconomic backgrounds [*smoked*] (…) Now, it's often kids [*who smoke*] from the poorer backgrounds, the poor socioeconomic, the broken homes, as in dysfunctional homes.
>
> (IRL2T2)

Staff were reluctant to apply stricter disciplinary measures on vulnerable adolescents because they believe it may interfere with schools' responsibility to educate and support *all* adolescents in preparation for their future life, particularly to leave school with a diploma. They reasoned that staff should take into account the lower priority of addressing smoking, relative to an adolescent's overall situation and developmental needs, when applying the rules.

> You have to take into account the hierarchy of problems in each young person's life and behavior. All the underlying issues. So, the aim is to improve the young person's life-situation overall and not focus on the smoking like it's the end of the world.
>
> (FIN2M)

However, this more lenient approach did not imply that vulnerable adolescents can do whatever they want. Staff members mentioned that all adolescents, including those who are considered to be vulnerable, have to show the right intentions (e.g. smoke further away from school, and not in a hidden spot at the premises), and failing from doing so will eventually result in stricter disciplinary measures—that is, vulnerable students are treated as exceptions when they *cannot*, not when they *want not*.

> It's only when we truly believe they simply don't want to adhere to our rules [*that they will be disciplined*] (…) At a certain point, it's got nothing to do with your situation anymore, it's simply your behavior.
>
> (NLD1M1)

Staff's application of stricter disciplinary measures will not stop persistent violators and is more likely to create other problems

Staff argued that SFSPs effectively discourage some adolescents to initiate smoking and even encourage some adolescents to reduce or even stop smoking, but are commonly insufficient to effectuate change in persistent violators' smoking behaviours. They reasoned that the

associated disciplinary measures, as an external motivator, predominantly cause persistent violators to find ways to circumvent staff's monitoring of the rules, which subsequently creates other problems (e.g. lose sight of adolescents' whereabouts). And then, even if persistent smokers got caught circumventing the rules, the experience was that stricter disciplinary measures more often lead to tensions between staff and adolescents than actually stopping them from violating the rules. Staff therefore preferred not to apply stricter disciplinary measures on persistent violators, but instead chose to keep a dialogue going, hoping that 1 day these adolescents will be intrinsically motivated to stop smoking and therewith adhere to the rules.

> Like in all public places, of course, it is forbidden to smoke (…) So they hide. They go in the washrooms to smoke. So we have to work on that, that's clear. We give sanctions, but it doesn't change anything, we have to do more work in depth, we have to make them aware, not punish them.
>
> (BEL2M)

Following this line of reasoning, some of the schools prohibited most of their staff from disciplining adolescents themselves, but instead staff were expected to refer them to someone who is formally responsible for dealing with rule violators. In other schools, some staff who had the authority to discipline were hesitant to use it, because they were afraid to damage the personal connection and therewith the ability to engage in dialogue: adolescents could stop perceiving a staff member as someone who tries to help them, but instead as someone adolescents should be careful with.

> I'm not the one who imposes disciplines. Because once I start imposing disciplines, then I will lose the possibility to casually chat with the boy or girl (…) then I'll become the janitor who will only [*adolescents' main association*] impose disciplines.
>
> (NLD1S)

Staff's use of more implicit language also underscored their preference for keeping a dialogue going over applying stricter disciplinary measures. They, for instance, referred to SFSPs that prohibit and discipline smoking anywhere during school hours as 'repression' (GER2T1) or said that government's plan to adopt more comprehensive rules would require staff to 'act like a police officer' (POR3M).

Staff's influence on adolescents' smoking is minimal if schools are not supported by relevant actors in society

Staff argued that educational policies and society as a whole have become increasingly demanding on schools.

Nowadays, schools are expected not only to manage adolescents' academic development, but also to promote adolescents' well-being and health, and deal with all kinds of issues that may cause any harm. Staff, however, reasoned that the expectations are too high because schools do not have all the necessary means or influence. They underpinned this view by arguing that schools 'cannot support aspects that go against the evolution of society' (BEL3M), and that the problems occurring in schools are always a 'reflection of [*the problems in*] society' (POR2M)—that is, one cannot expect schools to effectively deal with issues that are not adequately dealt with in or supported by other relevant actors in society (e.g. parents, health services, local governments and laws).

> Much of our work is 'putting out fires', the causes of which are elsewhere. (…) people blame the school, like 'you aren't doing anything about this', but the causes are somewhere completely different.
>
> (FIN2M)

Staff commonly referred to two central causes of smoking and rule breaking which schools can hardly influence, but that significantly hamper them to effectively deal with adolescent smoking during school hours. First, adolescents may live in social contexts in which smoking has been an integral aspect of daily life since they were young (e.g. smoke together with parents at home, go with their friends to bars that illegally allow inside smoking). Staff's experience was that their influence on these adolescents is marginal, because they have commonly developed a nicotine dependence and think that non-smoking at school is the deviation from what is normal in their social environment. Many staff across the countries were discussing this problem and contemplating about possible solutions, such as smoking cessation programmes and intensifying school break activities, but even in the most progressive countries (i.e. Finland and Ireland) a strategy was still absent.

> I think is very good [*to strictly enforce SFSPs*] and I think most people would want that to happen, but as I say, nobody has really come up yet with a way or a strategy as to how we are to deal with that last group of students.
>
> (IRL2M)

Second, parents who do not support the school rules may undermine staff's enforcement of SFSPs. Staff referred to instances when parents told staff they do not care or cannot do anything about their child breaking the school rules, or when parents even made phone calls to school, demanding that their child should be allowed

to smoke. This parental attitude was reasoned to weaken the authority of schools as adolescents chose the side that aligns most with their own desires. Specifically, adolescents may use their parents' permission to debate the validity of the school rules when caught smoking and, unlike most others, feel no deterrence in the anticipation their parents could be informed about their smoking behaviour. The need for improving parental involvement to deal with smoking during school hours was discussed among staff in all countries, but the common experience was that parents whom schools most desperately want to involve, are the least receptive to any school initiative.

> Parents should support the school policy. If we don't try to work together (…) If they undermine us, then it's no use. Then we'll not be able to get anywhere.
>
> (NLD4M)

DISCUSSION

We explored in which circumstances staff in European countries turn a blind eye on adolescents who keep on violating the rules, and what considerations underlie their choice when they turn a blind eye on such persistent violators. Staff's turning a blind eye on persistent violators was shown to happen in all countries, but was particularly common practice in countries where schools implement rules that prohibit smoking anywhere during school hours (i.e. Finland, Germany and Ireland). Three considerations help us understand why staff tend to turn a blind eye on persistent violators. First, staff's primary role is supporting all adolescents to develop into well-functioning adults. Second, staff's application of stricter disciplinary measures will not stop persistent violators and is more likely to create other problems. Third, staff's influence on adolescents' smoking is minimal if schools are not supported by relevant actors in society.

Limitations

Multiple interviewers were involved to ensure that interviews were held in a country's native language. Despite a joint training session, this led to somewhat different foci during the interviews and to variation in the extent to which staff were probed to further elaborate on their views. We consequently cannot exclude that our observations would have had somewhat different nuances if all interviewers had thoroughly discussed staff's choice to turn a blind eye.

Also, in our cross-country comparative design, data collection was not stopped upon reaching theoretical saturation, but when a predefined numbers of interviews at a predefined number of schools was met per country.

Still, given the large number of interviews that we held and the similar discourses that we observed across countries, we consider it unlikely that additional interviews would have resulted in different conclusions.

Interpretation of findings

We found that staff turning a blind eye on persistent violators happens systematically and in all participating countries, but is particularly common practice in schools that formally prohibit any smoking during school hours on and outside the premises (i.e. most comprehensive SFSPs). This, however, does not imply that we should conclude that far-reaching SFSPs are undesirable, because these schools also had a substantially lower weekly smoking prevalence than schools with less comprehensive SFSPs, and possibly this lower prevalence was the consequence of far-reaching SFSPs. Still, the recurring recommendation for governments to adopt legislation that requires schools to implement more comprehensive SFSPs seems to underestimate the enforcement problems that will inevitably follow, because currently even school staff in Ireland and Finland—both countries with strong traditions in tobacco control—were unwilling to consistently enforce the official rules on persistent violators. A recent study similarly showed that Dutch schools refrain from voluntarily adopting formal rules like in Finland, Germany and Ireland precisely to avoid problems with enforcement (M. Schreuders et al., accepted for publication). We therefore believe it is vital to intensify efforts that support staff's enforcement.

Staff's first consideration is that SFSPs have become increasingly comprehensive and that strictly enforcing these rules may harm the development of the most vulnerable adolescents. Their consequent preference to turn a blind eye on these vulnerable adolescents can be understood in perspective of schools' societal role and Western European societies' meritocratic structure. Specifically, schools have the institutional mandate to educate *all* adolescents in preparation for their future in a context where academic achievement predicts future success (van de Werfhorst, 2015). Then, perhaps staff could be right in their assessment that supporting vulnerable adolescents to leave school with a diploma is more important for adolescents' future than sacrificing this if they refuse to stop smoking during school hours. Similar reasoning was found among American staff at special education schools (Pentz et al., 1997), while another study suggested that disciplinary measures could indeed lower the academic performance among those with the highest risk of smoking (Poulin, 2007). Schools are not bars or restaurants that can easily remove

noncompliant customers, but institutes that want to do all they can to support every child in building a bright future.

Staff's second consideration is that disciplinary measures may not stop persistent violators and may rather create other problems. This view corresponds with a key finding in psychological literature: disciplinary measures are more likely to decrease unwanted behaviours among individuals in mainstream society than in social outgroups (Sherman, 1993; Duehlmeyer and Hester, 2019). Adolescent smokers, who increasingly belong to social outgroups, may indeed band together in attempts to circumvent the rules, subsequently leading to deviant self-labels and pro-smoking social meanings that may, in turn, promote rule breaking and smoking (Croghan *et al.*, 2003; Wakefield and Giovino, 2003; Schreuders *et al.*, 2019). Staff's decision to turn a blind eye on smokers who were not responsive to earlier warnings/disciplines also seems reasonable from the perspective they want to avoid creating new problems, because disciplines possibly start a vicious circle by further alienating smokers from the school environment (D'Emidio-Caston and Brown, 1998).

Staff's preference to stay in dialogue with persistent violators can be further explained by their philosophical resistance against the use of disciplinary measures that force, rather than convince, adolescents to change their health behaviour (Linnansaari *et al.*, 2019). Western European culture is characterized by values of autonomy, equality and individualism (Hickson, 2015), strongly emphasizing the need to respect individual choice and responsibility when implementing policies that aim for behavioural change (Willemsen, 2018). This cultural influence indeed became apparent in staff's emphasizing the need to intrinsically motivate adolescents to stop smoking (i.e. own choice) and maintain personal connection with adolescents (i.e. ability to influence adolescents' own choice). Similar values were expressed in another study by Dutch adolescents, including non-smokers, who think that tobacco control policies should protect non-smokers and support smokers to stop smoking, but should not violate individuals their 'right to smoke' (Schreuders *et al.*, 2018).

Staff's third consideration is that schools these days are not only responsible for adolescents' academic development but are also held responsible for aspects relating to adolescents' health and well-being that they can hardly influence. Schools indeed are increasingly expected to promote adolescents' health in more holistic ways than earlier times, when it was largely limited to health lessons (Weare, 2013; Langford *et al.*, 2014).

Staff, however, seemed to experience a lack of means to effectively deal with persistent violators, because they have no real means to support nicotine-dependent adolescents and cannot override negative parental influence. Scholars in earlier studies propagated that schools should be provided complementary means and receive external support to help staff enforce SFSPs (Hamilton *et al.*, 2003; Soteriades *et al.*, 2003; Schreuders *et al.*, 2017), such as smoking cessation services.

Staff's preference to turn a blind eye on adolescents whom are difficult to influence may also reflect that staff do not want to be held responsible for adolescents' smoking behaviour. Studies indeed indicate that school staff think they have to spend too much time on behaviour management (Office for Standards in Education, Children's Services and Skills, 2014) and feel burdened by the increasing high societal expectations placed on schools (Gordon and Turner, 2003). However, the subsequent choice to turn a blind eye on persistent violators causes a situation in which nobody takes responsibility for encouraging them to quit smoking (Pentz *et al.*, 1997): governments mandate schools to take responsibility, schools expect parents to take responsibility and parents of the most vulnerable adolescents likely expect everybody to leave their child alone.

CONCLUSIONS

Secondary schools in Europe implement increasingly comprehensive SFSPs. However, the effectiveness of these policies may be compromised by school staff's tendency to turn a blind eye on adolescents who persistently violate the rules. Staff choose to do so because they consider it more important that they support all adolescents into becoming well-functioning adults, believe disciplinary measures are ineffective and create other problems, and experience to have insufficient influence to stop all adolescents from smoking. Staff's considerations are not merely attempts to evade responsibility, but rather stress the need to support school staff in enforcing the increasingly comprehensive rules on the most persistent smokers.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

FUNDING

INFORMED CONSENT

All participants were informed about the study, their right of participants in scientific research and asked for (written) approval (Supplementary File S3).

ETHICS

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committees in the participating countries, and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval was obtained separately for each of the cities to comply with the national standards.

Belgium: REF 2012/09OCT/461 N° enregistrement belge B403201215182—Comité d'éthique Hospitalo-Facultaire des Cliniques Universitaires Saint-Luc.

Germany: Ethical approval MLU Halle-Wittenberg: 2016-90 hm-bü. Supervisory school authority, Hannover: H 1 R b—81402—55—2016. Supervisory school authority Lüneburg (Celle): LG 1 R.22—503000.

Portugal: General Directorate for education, approval number 0338600002 on 26 July 2016.

The Netherlands: Medical Research Involving Human Subjects Act (WMO): reference number W16_252 # 16.297, 11 August 2016.

Ireland: Research Ethics Committee–Dublin Institute of Technology: Ethical Clearance Ref 15-105, 16 June 2016.

Finland: Ethics Committee of the Tampere Region, Statement 29/2016.

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PUBLICATION
IV

Towards tobacco-free generation: Implementation of preventive tobacco policies in the Nordic countries

Linnansaari, A., Ollila, H., Pisinger, C., Scheffels, J., Kinnunen, J.M., & Rimpelä, A.

LITERATURE REVIEW

Towards Tobacco-Free Generation: implementation of preventive tobacco policies in the Nordic countries

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Abstract

Aims: Europe's Beating Cancer Plan set a goal of creating a Tobacco-Free Generation in Europe by 2040. Prevention is important for achieving this goal. We compare the Nordic countries' preventive tobacco policies, discuss the possible determinants for similarities and differences in policy implementation, and provide strategies for strengthening tobacco prevention. **Methods:** We used the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) to identify the key policies for this narrative review. We focused on Articles 6, 8, 9, 11, 13 and 16 of the WHO FCTC, and assessed the status of the required (core) and recommended (advanced) policies and their application to novel tobacco and nicotine products. Information on the implementation of strategies, acts and regulations were searched from global and national tobacco control databases, websites and scientific articles via PubMed and MEDLINE. **Results:** The WHO FCTC and European regulations have ensured that the core policies are mostly in place, but also contributed to the shared deficiencies that are seen especially in the regulations on smokeless tobacco and novel products. Strong national tobacco control actors have facilitated countries to implement some advanced policies – even as the first countries in the world: point-of-sale display bans (Iceland), outdoor smoking bans (Sweden), flavour bans on electronic cigarettes (Finland), plain packaging (Norway), and plain packaging on electronic cigarettes (Denmark). **Conclusions:** Collaboration and participation in reinforcing the European regulations, resources for national networking between tobacco control actors, and national regulations to provide protection from the tobacco industry's interference are needed to strengthen comprehensive implementation of tobacco policies in the Nordic countries.

Keywords: *Tobacco policies, tobacco prevention, tobacco control, WHO FCTC, tobacco-free generation, tobacco endgame, policy implementation, policy implementation research, policy adoption, the Nordic countries*

Introduction

In 2021, the goal of Tobacco-Free Generation in Europe was set in Europe's Beating Cancer Plan, with less than 5% of the population using tobacco products by 2040 [1]. Tobacco prevention is key to achieving this goal. Preventive policies are integral in the provisions of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) [2], which requires that countries implement effective measures and cooperate with others in developing policies for the prevention and reduction of tobacco consumption, nicotine addiction and exposure to tobacco smoke. Comprehensive implementation of the key WHO

FCTC policies has been shown to be important in diminishing tobacco use [3].

All the Nordic countries had acceded to the WHO FCTC already by 2005 and have succeeded in reducing adolescent daily smoking, which in 2019 ranged from 1.9% in Iceland to 10% in Denmark. Smokeless tobacco and novel products, such as electronic cigarettes (e-cigarettes) and nicotine pouches, are creating new challenges for prevention. In 2019, e-cigarette use during the last 30 days was most common in Iceland (17%) and least common in Sweden (6.4%) [4]. In a recent Nordic comparison, the proportion of dual and triple users among youths was high [5]. In addition, variation remains in the comprehensiveness of the implementation of tobacco control policies. In the most recent European tobacco control scale from 2019, Iceland was fourth, Norway fifth, and Finland sixth in a comparison of the key tobacco control measures across 36 European countries, with no major changes since 2010. For Sweden, the ranking has declined from 9th to 15th, and for Denmark from 13th to 29th [6, 7].

Despite the need for accelerating the implementation of tobacco policies, research has mainly focused on the impact of policies rather than on their adoption and implementation. Perceiving implementation outcomes as health benefits may partly explain the lack of focus on implementation itself in health policy research [8, 9]. However, differentiating implementation outcomes (i.e. adoption, feasibility and fidelity) from health outcomes makes visible what is required from the implementation to reach the targeted health outcomes [10]. Furthermore, evidence on effectiveness does not solely explain the adoption of policies [11], and therefore understanding complex policymaking processes is crucial to increase the adoption and implementation of tobacco policies [12]. The need for increasingly integrating research on public health, implementation and politics has been debated during the past decade [13–18].

In this study, we integrate insights from these contributing disciplines to understand better and overcome challenges in the adoption and implementation of preventive tobacco policies. We aim to assess and compare the comprehensiveness of preventive tobacco policies in the Nordic countries, focusing on the implementation of the WHO FCTC policies and their application to novel tobacco and nicotine products. In addition, we discuss what determinants may underlie the similarities and differences in the policy implementation and consider how countries have impacted each other. While we acknowledge that the practical implementation and enforcement of the national legislation is an essential parallel process, in this study we consider the policies implemented when

the respective provisions in national laws or other regulations have been enacted. Our objective is to provide strategies for strengthening the comprehensive implementation of tobacco policies to target the Tobacco-Free Generation at the national and Nordic levels. The research questions for the study are:

1. How comprehensively are the preventive WHO FCTC policies implemented in the Nordic countries? What similarities and differences exist between the countries? How have the Nordic countries influenced each other's policy adoption and implementation?
2. What national, European and global determinants may have influenced policy adoption and implementation in the Nordic countries? How have they facilitated or hindered the policy adoption and implementation?

Methods

Our study is a narrative review forming a scholarly summary, along with an interpretation and critique [19], that iteratively follows the stages suggested by Mays et al. [20]. The method provided us with an opportunity to extend the existing understanding on the adoption and implementation of preventive tobacco policies in the Nordic countries by synthesising multifaceted and fragmented information from various sources. Regarding the five stages of producing public policies – agenda setting, policy formulation, adoption/decision-making, implementation and evaluation [21] – we mainly focus on explaining the adoption phase. In line with the implementation outcome frameworks [9, 10], policy 'adoption' is defined as our implementation outcome. In this study, the adoption indicates the decision-making process leading (or not) to tobacco policies being implemented at the national level, namely to the enactment of the respective provisions in the national laws and regulations.

We focused on six WHO FCTC provisions that are most relevant in the light of scientific evidence for preventing uptake and exposure to tobacco and nicotine in adolescence: taxation and price policies (Article 6), protection from exposure to environmental tobacco smoke (Article 8), product regulation (Article 9), packaging (Article 11), advertising and promotion (Article 13), and preventing product access by minors (Article 16). Under these, we categorised required measures as core policies, and recommended measures as advanced policies (see Supplemental file 1 for indicators). The WHO FCTC applies by default to all tobacco products: cigarettes, roll-your-own (RYO), pipe tobacco, water pipe tobacco and smokeless tobacco. To the extent

possible, we assessed the application of the core and advanced policies also to the following novel and emerging products: e-cigarettes, heated tobacco products (HTPs) and nicotine pouches. The behaviour change wheel (BCW) [22] guided the classification of the policies and helped in selecting a comprehensive set of policies as implementation objectives for the study. The BCW is an evidence-based framework that summarises policy and intervention measures that influence behaviour through motivation, capability and opportunities [22].

An initial search for information on the strategies, acts and other regulations in Denmark, Finland, Iceland, Norway and Sweden was performed by a research assistant, who compiled relevant information from the latest national tobacco control strategy documents that were identified in the national languages from governmental online databases and the websites of these countries, as well as the websites of non-industry-affiliated and non-governmental organizations (NGOs). Scientific articles and news were searched to identify information on policy changes, after which the search was broadened to the WHO FCTC implementation database [23] and the World Health Organization (WHO) global tobacco control policy data [24]. Based on the information obtained from these sources, the research assistant compiled a narrative describing the current regulatory scheme in each country and a summary of key differences and similarities. This was reviewed by the project team to identify the need for further information and validation. The research assistant then gathered additional information and amended the narrative with support from three researchers. The updated summary of policy comparisons (RQ1) was then sent for feedback to the health authorities in the Nordic countries in December 2020.

After the health authorities' feedback, the results on policy comparisons were revised by two researchers in close collaboration with the project team. This process included screening again the initial data sources and searching for additional data on strategies, acts and other regulations from the WHO FCTC implementation database [23], the WHO global tobacco control policy data [24] and governmental and NGO online databases and websites. To maintain the readability of the results section, all referenced databases, acts and regulations have been compiled and presented in Supplemental file 2 as part of the detailed policy comparisons of the selected articles. Initially, Article 15 (illicit trade) was included in the search topics, but it was removed at this stage after a decision to focus the paper on youth and prevention. To provide comparable estimates of the comprehensiveness of implementation of the WHO

FCTC measures, we utilised publicly available data from the WHO FCTC implementation database [23], and one researcher counted the number of implemented policies or measures under the selected provisions for every country (see Figure 1). For Article 8, both complete and partial bans were counted. Tax measures in Article 6 are derived from the 2021 WHO global tobacco control policy data [24].

The research questions were amended with the project team also to include the policy adoption and implementation aspect (RQ2). Our initial understanding of the main national, Nordic, European and global determinants for policy adoption and implementation was guided by the WHO FCTC and the core determinants for policy change: societal factors, institutions, networks/interest groups, agenda setting/framing and ideas [25] (Supplemental file 1). To analyse further how these factors may have influenced tobacco policy adoption and implementation in the Nordic countries, two researchers searched for grey literature via governmental and NGO websites (language: all national languages, timeline: 1990–2021) and key scientific articles via PubMed and MEDLINE (language: English, timeline: 1990–2021, keywords: tobacco polic*, preventive tobacco polic*, WHO FCTC, adopt*, implement*). Data were selected for further analysis if they provided information on the possible determinants and processes for tobacco policy adoption and implementation in the Nordic countries. We also used snowballing techniques to identify clusters of evidence. After the analysis was finished and the whole research team agreed with the results, the health authorities were further contacted for feedback on the results of RQ1 (November 2021) and for the results of RQ2 and revised results of RQ1 (January 2022). The feedback concerned validation of the information and led to only minor changes. The interpretation of the information is the sole responsibility of the authors.

Results

1. Preventive tobacco policies in the Nordic countries

1.1. Core policies

All the core policies required by the WHO FCTC were implemented at least to some extent in all countries. These include the 18-year age limit for sales, comprehensive prohibitions on tobacco use in schools, smoking bans in indoor public places, comprehensive bans on tobacco advertising, promotion and sponsorship (TAPS), and warning labels on cigarette packages. Iceland (implemented in 1969–1971, 1985) and

Norway (implemented in 1975) were among the first in the world to require health warnings. Norway has the strictest indoor smoking bans, whereas the most exceptions to the bans are found in Denmark. Denmark implemented age control measures later than the other countries; tobacco sales to minors were prohibited in 2004 with an age limit of 16 years, which was raised to 18 years in 2008.

All the Nordic countries have implemented tax policies on tobacco products, but by 2021 only Finland and Denmark had met the WHO recommendation of a minimum of 75% tax share of the retail price of tobacco. In recent years, Denmark has increased tax considerably, whereas Finland has increased taxes in small steps regularly since 2009. Both countries are now among the countries with the highest total tax in the European Union (EU). In Finland, Sweden and Norway, cigarettes became less affordable between 2010 and 2018, and they became less affordable in all Nordic countries from 2018 to 2020. Between 2018 and 2020, the change was the highest in Denmark and Finland and the smallest in Sweden and Iceland.

Sweden, Iceland and Denmark do not report that the advertising ban in TAPS also covers the global Internet. However, the WHO FCTC implementation guidelines for Article 13 do not provide a clear definition of the global Internet, which may have led to different interpretations of the TAPS bans in this context. Regarding the most recent WHO report [24], direct advertising on the Internet is banned in all Nordic countries. Challenges may arise from indirect advertising and the enforcement of the bans, for instance on social media platforms and advertising with cross-border effects. Iceland and Denmark have not prohibited cross-border advertising originating from their country, nor Iceland cross-border advertising entering the country. Finland is the only country reporting the imposition of penalties for cross-border advertising.

All the WHO FCTC provisions cover smokeless tobacco by default. Snus is sold in Sweden and Norway, chewing tobacco and nasal tobacco in Denmark and nasal tobacco that is also used orally in Iceland. In Finland, selling smokeless tobacco products for oral and nasal use is prohibited, but limited personal imports are allowed. Most of the core policies have been applied to smokeless tobacco products in countries that have smokeless products on the market. Smokeless tobacco is subject to taxation in Iceland (with a total tax of 62%), Norway (64%), Sweden (total tax rate not available) and Denmark (total tax rate not available). Smoking bans are generally not extended to the use of smokeless tobacco,

except in schools. Only Swedish legislation does not prohibit the use of snus in schools and on school grounds. In Finland, snus is included in the latest amendment that extended outdoor smoking bans to public playgrounds.

1.2. Advanced policies

Many Nordic countries were globally among the first to implement the more advanced measures recommended by the WHO FCTC or its implementation guidelines. Implementation of these advanced policies has extended since, but consistent implementation across the Nordic countries is still lacking. Iceland was the first country in the world to enact a point-of-sale display ban for tobacco products in 2001. All other Nordic countries except Sweden have since implemented the policy. In Denmark, Norway and Iceland, who allow online sales, the display ban also covers online stores, meaning that images of products may not be shown to the customer. In Denmark, images of pipes are excluded from the ban. Finland is the only Nordic country prohibiting the purchase of all tobacco products via distance communication, such as the Internet or email.

Bans on flavours for cigarettes and RYO have been implemented in all Nordic countries except in Sweden and Iceland. Such a ban is, however, also expected in these countries in 2022 as part of their implementation of the EU Tobacco Products Directive (TPD). Prohibitions on flavours in smokeless products have not been implemented in any country. Denmark has introduced a ban on characterising flavours other than tobacco and menthol in other tobacco products than cigarettes and RYO; for example, chewing tobacco (although pipe tobacco and cigars are excepted), but the ban will come into force when the EU law stemming from the TPD allows this. Pictorial warnings were first implemented in Iceland in 1985. None of the countries where smokeless tobacco is sold require pictorial warnings for these products. Norway will also introduce an additional health warning on oral tobacco relating to harms to the fetus in 2022. Norway was the first Nordic country to enact plain packaging in 2017. In Norway, it covers cigarettes, RYO and snus. In Finland, all tobacco products, and in Denmark, all tobacco products except cigars and pipe tobacco will be required to be in plain packaging.

Sweden has been most progressive in extending smoking bans in outdoor or quasi-outdoor public places, including areas outside childcare facilities, public playgrounds, terraces of cafés and restaurants, outdoor areas of public transport, such as bus stops and train stations and entrances to establishments, public

venues and other spaces to which the public has access. Also, Norway prohibits smoking outside the entrance to health institutions and public buildings. Finland has implemented smoking bans in audience areas at outdoor public events and recently extended the ban also to playgrounds and public beaches. Tobacco and nicotine-free school hours have been implemented in Denmark and Norway, and also other countries extend the bans to the outdoor premises of schools.

1.3. Comprehensiveness of the implemented core and advanced policies

When comparing the countries based on the number of reported core and advanced measures by early 2020 (see Figure 1), the implementation could be more comprehensive in all countries regarding most of the policies. Regulation on the content (Article 9) of tobacco products was rather comprehensive and consistent in the Nordic countries. Country differences can be seen especially in the comprehensiveness of smoking bans (Article 8), taxation (Article 6) and TAPS (Article 13). None of the countries stand out with clearly more comprehensive implementation of the provisions than others, but the countries have different strengths and deficiencies.

In Norway, many policies, such as the smoking ban (Article 8), have been comprehensively implemented, yet the level of taxes (Article 6) and regulations on the content of products (Article 9) could be reinforced. Finland has high taxes (Article 6) and comprehensive prohibitions on TAPS (Article 13), yet the smoking bans (Article 8) could be further strengthened by implementing complete bans instead of partial bans. In Sweden, many policies lack comprehensiveness, yet regulation on the contents (Article 9) is exhaustive – for smoking tobacco. A comprehensive ban on sales to minors (Article 16) has been implemented in Iceland, yet the taxes (Article 6) are low and the regulations on warnings and labelling (Article 11) are less comprehensive than in other countries.

1.4. Extending policies to novel tobacco and nicotine products

All the Nordic countries have enacted most of the core policies on e-cigarettes. Overall, Norway has been most strict by banning nicotine-containing e-cigarettes and e-liquids (as well as nicotine pouches) from entering the domestic market; however, after harmonising legislation with TPD, nicotine-containing e-cigarettes will be allowed in 2022. Iceland was the last to adopt the first national legislation on e-cigarettes, doing so only in 2018, with the legislation entering into force in 2019.

All countries require a health warning on e-cigarettes and have generally banned vaping in the same indoor areas as smoking. Prohibition on TAPS is fully extended to e-cigarettes in all countries – except Sweden – covering all the same direct and indirect forms of TAPS as for tobacco products, and partially also in Sweden. Finland, Sweden and Norway have excise tax for nicotine-containing liquids and nicotine-free liquids intended for vaporisation. Denmark will introduce a tax on nicotine-containing e-liquids in 2022.

Of the recommended advanced measures applied to e-cigarettes, display bans and flavour bans have received most attention in the Nordic countries. Finland, Norway and Denmark have also applied display bans to e-cigarettes. Finland was the first to prohibit flavours (except tobacco flavour) in e-cigarettes and e-liquids intended for vaporisation. Denmark has banned flavours other than tobacco or menthol in e-cigarettes and e-liquids. Also, the Norwegian, Icelandic and Swedish governments have recently proposed flavour bans in e-cigarettes. Denmark and Finland will require plain packaging for e-cigarettes and refill containers. In Norway, a proposal to extend plain packaging also to e-cigarettes was sent for public consultation in 2021.

The sale of snus-like nicotine pouches is unregulated in Iceland and Sweden. So far, all applications to market nicotine pouches in Norway have been rejected. Finland requires a medical sales permit. In Denmark, nicotine pouches, which are defined as tobacco surrogates, are subject to prohibition on sales to those under 18 years, a display ban, health warnings and restrictions on TAPS, but not a ban on flavours or plain packaging. Furthermore, the Danish parliament has just agreed to introduce a tax on nicotine products such as nicotine pouches from 1 July 2022. The Icelandic government has recently presented a legislative proposal to put nicotine pouches and other nicotine products under legislation comparable to e-cigarettes. It also suggests prohibiting nicotine products, such as nicotine pouches, with appealing flavours; if the legislation is passed, it will be the first of the Nordic countries to do so. In Sweden, government has recently proposed stricter regulations on tobacco-free nicotine products, such as 18-years age limit for sales and strengthening TAPS.

HTPs are sold in Denmark and Sweden, with the total tax being 43% in Sweden and 31% in Denmark. In Denmark, all novel tobacco products, such as HTPs, are subjected to an 18 years age limit for sales, a display ban, a ban on direct and indirect advertising and sponsorship in stores and online and a health warning. Denmark will require plain packaging also on tobacco for HTPs. In Sweden, HTPs are covered by health warnings, and the products are also subjected to the 18 years age limit for sales and regulations on TAPS. Although HTPs are not
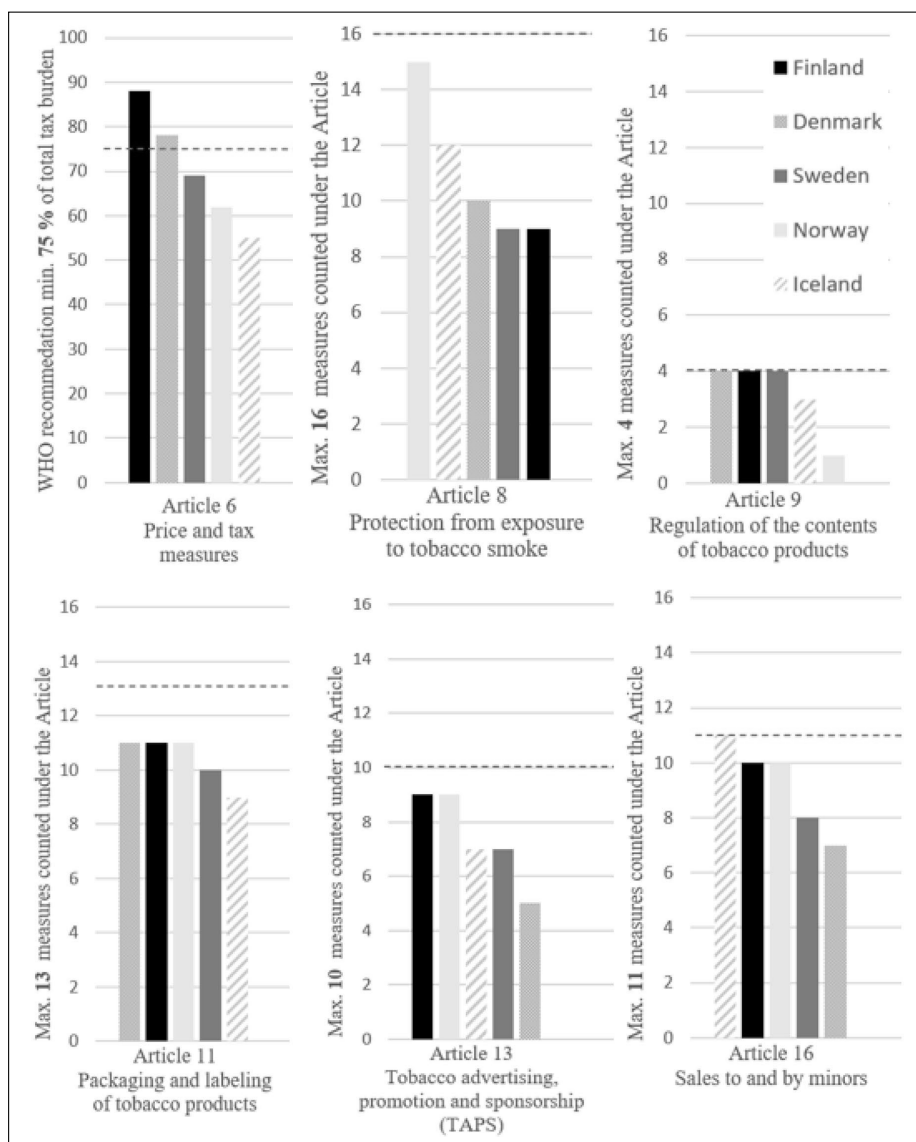
Figure 1. Comparisons of the comprehensiveness of the core and advanced preventive WHO FCTC policies in the Nordic countries. The horizontal dashed line indicates the maximum number of measures counted under the article (Articles 8, 9, 11, 13 and 16) or the recommended minimum level of implementation (Article 6).
The included measures are described in Supplement 1.

sold in Finland, the products are already subject to similar regulation as other tobacco products, such as the age limit for sales, smoking bans and taxation. A display ban concerning HTP devices and plain packaging are included in the latest legislative proposal.

1.5. Impact of Nordic countries on each other

As the Nordic countries have their individual strengths and deficiencies in policy implementation, it provides a great basis for knowledge sharing and policy diffusion from one country to another. In Finland and Norway,

where the display ban was adopted in 2010, the legislative proposals referenced Iceland as one of the countries having already implemented the ban [26, 27]. Iceland implemented the ban in 2001 as the first country in the world (Supplemental file 2). Demonstrating other countries' more advanced policies may also put pressure on decision-makers to move forward. This was the case in Denmark, where the recent significant improvements in tobacco control were demanded of decision-makers by highlighting the examples of the other Nordic countries [28].

On the other hand, more lenient tobacco policies in some countries may undermine tobacco prevention in other countries. For instance, some countries have a wider selection of tobacco and nicotine products on their national markets, which challenges the strict demand and supply reduction measures in other countries. For example, as Sweden has the exemption to snus sales and it does not regulate traveller exports of snus, it is common to import it to Norway, Finland and Denmark. The incentive to import snus arises both from the national sales ban (in Finland and Denmark) and from lower prices, both compared to cigarettes and local smokeless tobacco [29]. The sale of snus is allowed in Norway, but lower prices have made private imports from Sweden in particular – as well as tax free purchases [30] – common. In Denmark, concerns that higher tobacco prices would lead to an increase in cross-border trade from neighbouring countries to Denmark long prevented the raising of taxes [31].

2. Global, European and national determinants have influenced the adoption and implementation of preventive tobacco policies in the Nordic countries (see Figure 2)

2.1. Global and European regulations

All Nordic countries acceded to the WHO FCTC early. Norway was the first and has overall contributed to tobacco prevention being a high priority on the WHO's agenda. In this, a significant role has been played by Gro Harlem Brundtland, former director-general of the WHO, who established the tobacco free initiative and initiated the WHO FCTC negotiations [32]. Overall, the Nordic countries have been actively involved in shaping and advancing global tobacco control policies. For instance, Finland was proactive in drafting resolutions calling for an international tobacco control treaty in 1995–1996 [32], and the Finnish public health strategy 'Health 2015' in 2001 included a statement of the aim to achieve the WHO FCTC [33]. Once the treaty was established, Finland was one of the facilitators in the

working group, with Sweden and Iceland among the partners, drafting the guidelines for the implementation of Article 13 [34]. Currently, the Finnish Institute for Health and Welfare hosts one of the WHO FCTC knowledge hubs. Norway has provided funding to the projects coordinated by the convention secretariat, including the FCTC2030 project [35], which supports parties in achieving the United Nations Sustainable Development Goals (SDGs) by accelerating the implementation of the WHO FCTC. In its international development strategy, Norway also aims at strengthening the implementation of the convention in low-income countries [36]. Denmark and Norway have utilised the international framework by engaging in a formal external country evaluation of WHO FCTC implementation to strengthen their national tobacco control [31, 37].

As members of the EU, Finland, Denmark and Sweden are obliged to transpose the Tobacco Products Directive (2014/40/EU) (TPD), the Tobacco Taxation Directive (2011/64/EU) (TTD) and the Tobacco Advertising Directive (2003/33/EC) (TAD) into their national legislation. As members of the European Economic Area (EEA), Iceland and Norway are obligated to implement all relevant EU directives, including most of the tobacco directives, but not the TTD. Also, lack of effective EU-level standards on tobacco taxation, as stated in the recent evaluation of the TTD [38], may have led to a variance in tobacco taxes between countries. A recent assessment of the TAD [39] highlights the need to regulate cross-border advertising and promotion particularly on the Internet and social media, yet the TAD focus on the traditional advertising and promotion channels partly explains the variance in regulation on TAPS on the online platforms.

Due to the TPD, all countries require health warnings on cigarette packages and limitations for nicotine in e-cigarettes, yet TPD has not harmonised all national regulations: Sweden (on EU accession) and Norway (on EEA accession) have negotiated exemptions on smokeless tobacco sales based on the historic availability of snus in their market. Also, the countries' varying regulations on novel tobacco and nicotine products, and even regarding the core policies, may be partly explained by the shortcomings of the TPD (e.g. regulations on HTPs and nicotine pouches) [40]. TPD has also caused negative consequences or delayed progress as, for instance, Finland and Norway had to open their national market to nicotine-containing e-cigarettes after implementing TPD. Also, in Denmark, the ban on characterising flavours other than tobacco and menthol in other tobacco products than cigarettes and RYO, such as in chewing tobacco [41], will come into force only when the EU law stemming from the TPD allows this.
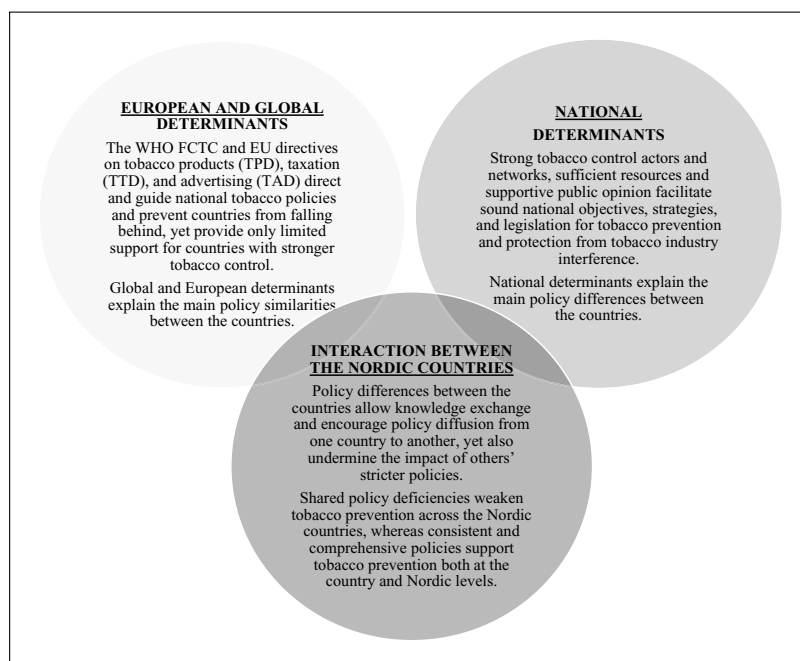
Figure 2. Summary of the global, European, Nordic and national determinants on the adoption and implementation of the preventive tobacco policies in the Nordic countries.

2.2. Sound national objectives, strategies and legislation for tobacco control

The Nordic countries demonstrate different histories in tobacco legislation. The first tobacco legislations date to the 1960s in Iceland (Alcoholic Beverages and Tobacco Trading Act no. 63/1969); the 1970s in Norway (Tobacco Control Act 14/1973), Finland (Tobacco Act 693/1976), and Sweden (Act Regulating Some of the Marketing of Tobacco Products 1978:764); and the 1990s in Denmark (Act on the Labelling of Tobacco Products and on the Tar Content of Cigarettes 426/1990).

Finland was the first Nordic country to publish a national tobacco control strategy in 1997, providing recommendations for stakeholders such as ministries, municipalities and schools to prevent smoking [42]. In 2001, the first national reduction target was set for youth smoking prevalence [33]. In 2010, as the first to do so in the world, Finland implemented the endgame objective of its Tobacco Act, aiming at a less than 5% tobacco use prevalence by 2040. The endgame goal was argued to illustrate the fundamental aim of tobacco control. It was also an important message to the tobacco industry and tobacco retailers regarding progressive restrictions on manufacture, distribution and supply [26]. In 2016, the goal was broadened to cover all non-medicinal nicotine products and moved the target forward to 2030.

In Norway, the first long-term strategy plan for tobacco control was adopted in 1999, and the most recent strategy is for 2019–2021 (Table I). Norway does not have a set endgame objective as Finland does, but in 2013 the Norwegian Tobacco Control Act objective was amended to include the goal of a tobacco-free society [43]. Denmark implemented the first national action plan in 2019, aiming comprehensively to stop and prevent children and adolescent smoking and nicotine addiction [41]. In Sweden, the government acknowledged and supported the NGO-led Smoke-Free Sweden 2025 in its strategy on alcohol, narcotics, doping and tobacco [44]. Iceland does not have an official tobacco control objective or strategy, but it has successfully implemented the Icelandic prevention model, which also targets smoking prevention [45, 46].

2.3. Strong national structures for tobacco control

In the Nordic countries, the ministries of health have a leading role in tobacco control, and their commitment

Table I. Tobacco control objectives and strategies in the Nordic countries in 2022.

Country	Denmark	Finland	Iceland	Norway	Sweden
National tobacco control strategies in force	National action plan against children and adolescent smoking [41]	Substance abuse and addiction strategy – common guidelines for 2030 [47]	No current strategy	National tobacco strategy 2019–2021 [48, 49]	ANDT strategy 2016–2020 [44] Proposal for the new ANDT strategy 2021–2025 [50]
Objectives of the current national tobacco control strategy	Prevent and stop children and adolescents from smoking and nicotine addiction	End the use of tobacco and nicotine products by the year 2030	No current objectives	Reduce the amount of people smoking daily below 10%, the use of snus among young people should not increase, and knowledge about the use of tobacco among pregnant women should increase	Reduce access to tobacco, decrease early first use of tobacco by young people, reduce tobacco use in adults and children (below 5% daily smokers), give better access to treatment, decrease tobacco-related morbidity and mortality

ANDT: Alcohol, narcotics, doping and tobacco.

partly explains the rather comprehensive policies compared to many other European countries [7, 23]. Norway's strong tobacco control history may be largely explained by its strong health ministry [37]. A governmental office for tobacco control (the National Council on Tobacco and Health) was already established in 1971 [51]. The WHO awarded the Finnish Ministry of Social Affairs and Health for its long-term commitment to tobacco control and its exemplary actions to protect young people from tobacco, especially e-cigarettes, on World No Tobacco Day in 2020 [52]. In Denmark, strong political commitment was not in place until recent years, which can be seen in Denmark's relatively weak tobacco control history [31].

The strength of the health ministries in many Nordic countries has been supported by the establishment of tobacco control units, referring to a specialised agency or unit responsible for tobacco control. For instance, in Norway, the Norwegian Institute of Public Health (NIPH) works directly under the Ministry of Health and Care Services and produces knowledge on tobacco policy effectiveness and feasibility of implementation, and it thus guides the adoption and implementation of policies at the national level.

The financial resources for national tobacco control vary by country. The guidelines for implementing WHO FCTC Article 6 recommend that countries consider dedicating tobacco tax revenue to tobacco control programmes, such as those covering raising awareness, health promotion and disease prevention and cessation services [53]. However, none of the Nordic countries earmark a percentage of tobacco taxation income for the funding of any national plan or strategy on tobacco control. Nevertheless, in Iceland, 0.9% of all sold tobacco revenue is earmarked for tobacco control and tobacco prevention. The money has been distributed through a public health fund since 2011 [23, 54, 55]. Insufficient funding and resources have been highlighted as a barrier

for sustaining progress in Norway [37], and for achieving the endgame goal by 2030 in Finland [56].

2.4. Active participation of civil society

NGOs have actively participated in formulating tobacco prevention in many Nordic countries. Strong NGOs exist in Sweden, Finland and Denmark, whereas in Norway their role has in recent years been minor [37]. Strong NGOs are often associated with governmental funding [57]. The NGOs have contributed to tobacco policy adoption by setting agendas, framing policies and building intersectoral collaboration. In Sweden, the NGOs led and formulated the objective for Smoke-Free Sweden 2025 [58], and have recently expressed their concerns on the stagnation in progress in national tobacco prevention [59]. In Denmark, the Danish partnership Smoke-Free Future anchored in the Danish Cancer Society initiated a collaboration in 2017 with the WHO regional office for Europe (WHO Europe) and the European Network for Smoking and Tobacco Prevention (ENSP) to drive progress in Danish tobacco control by engaging in a WHO FCTC capacity assessment [31]. In Finland, the intersectoral collaboration within the Tobacco-Free Finland network led by ASH Finland partly explains Finland's favourable progress in tobacco control, especially during the past decade [52, 56]. Civil society's input in keeping tobacco issues and the best solutions on policy agendas is crucial to maintain sustainable progress in tobacco prevention when the decision-makers' interest may decrease after tobacco control objectives are achieved [56].

2.5. Preventing tobacco industry interference

The WHO FCTC Article 5.3 requires parties to protect their public health policies from the commercial and other vested interests of the tobacco industry [60], yet according to a recent comprehensive assessment, countries vary in the implementation of the

measure [61]. Regarding the Nordic countries, so far only Norway has a national strategy in harmony with Article 5.3 [48, 49].

The tobacco industry influences all the Nordic countries, yet the presence appears to be most prominent in countries with their own tobacco manufacturing: snus and nicotine pouches are produced in Sweden, and snus, pipe tobacco, and cigars are made in Denmark. In Denmark, the tobacco industry's active influence on policymakers and the public [62] has significantly contributed to Denmark's slow progress in tobacco control in recent decades [31]. In Sweden, the snus industry has been active in lobbying local politicians and members of the European parliament, with invitations to events and seminars, and direct contacts to politicians. Snus is being presented as a product intertwined with Swedish cultural history, even though the growing and the production of tobacco for snus has occurred elsewhere for decades [63].

Overall, collaboration between the multinational tobacco companies, Nordic national manufacturer associations and local companies has delayed the implementation of smoke-free laws and health warnings on tobacco packages [64]. In Norway, Swedish Match aimed to delay the legislation on plain packaging by arguing that the Norwegian government was in breach of the free EEA trade rules and that the plain packaging of snus boxes was not in line with the health risks associated with snus. The court rejected Swedish Match's claims, ruling that plain packaging was an internationally recommended and effective measure in line with the EEA [65].

2.6. Powerful public opinion

Public opinion is considered as a prerequisite for policy adherence and thus for enacting greater tobacco control [56]. A recent study [66] showed that public opinions on tobacco control differ by smoking status. Daily smokers viewed stricter tobacco control policies and workplace smoking bans more negatively and the availability of tobacco products more positively, as well as more often considered the present tobacco policy sufficient. Regardless of the smoking status, all showed positive attitudes towards the prevention of youth smoking [66]. With respect to this, tobacco policies are often framed to protect future generations from the harms of tobacco (i.e. the 'child frame'). This was the case also in Denmark, where an increase in adolescent smoking fuelled widespread public pressure for political action that led to a comprehensive tobacco control strategy [41] and considerable improvements in tobacco control [31]. This further shows how public opinion is a powerful tool for facilitating agenda setting and policy adoption.

Discussion

Our results show that the core preventive measures required by the WHO FCTC are rather comprehensively in place in the Nordic countries, and the countries have also implemented many of the advanced policies recommended in the treaty. However, individual weaknesses and shared deficiencies across the countries also exist that continue to undermine tobacco prevention. Our results inform the current tobacco control comparisons, such as the Tobacco Control Scale [7], by demonstrating the importance of considering the evolving tobacco control landscape when evaluating policy comprehensiveness.

The emergence of policies is a complex process determined by the interactions between actors holding power [11, 67]. Our results demonstrate how differences in the power, commitment and networking of the national tobacco control actors explain differences in countries' tobacco policies. The key actors, namely the health ministry (strongest in Finland, Norway and Iceland), civil society (strongest in Sweden, Denmark and Finland) and public opinion (strongest in Denmark), have facilitated countries to implement many advanced policies among the first countries in the world: the endgame objective and flavour bans on e-cigarettes (Finland), outdoor smoking bans (Sweden), plain packaging (Norway), plain packaging on e-cigarettes (Denmark) and display bans (Iceland). In addition, if the current legislative proposal is passed, Iceland will become the first Nordic country prohibiting appealing flavours in nicotine pouches. Ensuring resources for these national actors and their coordinated collaboration in line with WHO FCTC Article 5.2. is important for sustainable progress in tobacco prevention, such as for strengthening the national strategies to provide protection from the tobacco industry's interference. Currently, only Norway has strategies in line with WHO FCTC Article 5.3., yet the tobacco industry's interference seems strongest in Sweden and Denmark.

Intersectoral collaboration is also emphasised in the health in all policies (HiAP) approach, which aims to consider health, wellbeing and equity in all policy-making, and thus to enforce health-promoting environments [68]. As HiAP can be excellently implemented in tobacco control, communicating the national tobacco prevention via HiAP could ensure commitment to tobacco prevention across the policy-makers and thus facilitate the implementation of more comprehensive tobacco policies. Furthermore, HiAP could provide a valuable approach to build joint public health and tobacco control objectives and strategies across the Nordic countries that currently seem somewhat distinct from each other. Strengthening HiAP in global and European regulations in line with Europe's

Table II. Strategies to strengthen the preventive tobacco policies and facilitate their adoption and implementation.

Strengthening the tobacco policies	Strategies to facilitate policy adoption and implementation
Extending regulations to all products Stronger protection from the tobacco / nicotine industry to reduce the number or availability of tobacco and nicotine products on the markets. Further measures to control the supply of nicotine products entering the domestic and European markets. Extending the regulations to all tobacco and nicotine products.	**National** Developing national endgame objectives and strategies to prevent and reduce tobacco consumption, nicotine addiction, and exposure to tobacco smoke in line with the WHO FCTC and Europe's beating cancer plan. Applying the HiAP approach and 'child frame' to strengthen societal and political support for tobacco prevention. Classification of all novel and emerging tobacco and nicotine products as tobacco products or other integration of these products into the national tobacco control regulations to prevent novel products from circumventing the regulations. Providing essential resources for sustainable progress, for instance, by earmarking money from tobacco taxes for prevention. Strengthening intersectoral collaboration and networking between the health ministry, tobacco control units, civil society, and other relevant actors, for instance, by allocating resources to coordinating efforts and co-operation.
High and consistent tax and price measures Increasing taxes and prices on all tobacco and nicotine products. Ensuring that tax measures apply also to novel products. Ensuring a high minimum price for all products.	Developing national strategies in line with the WHO FCTC (Article 5.3) to protect tobacco control and public health policies from commercial and other vested interests of the tobacco industry. Countering tobacco industry interference. Establishing measures to limit interactions of public officials and civil servants with the tobacco industry and ensure the transparency of any interactions that occur. Governments should prohibit, or at least mandate the disclosure of, the tobacco industry's donations of funds and in-kind contributions to political parties, trade unions or their foundations, and think tanks. The corporate social responsibility strategies of the tobacco industry should be de-normalised and prohibited.
Extending prohibitions on TAPS to novel channels Extending regulations on TAPS to also cover contemporary advertising channels, such as social media and packages of all products. Online sales should be banned as they inherently involve tobacco advertising and promotion.	**Nordic** Collaboration to ensure consistent tobacco control objectives, strategies, and policies across the Nordic countries. Introducing and strengthening HiAP as a joint approach for decision making on tobacco prevention and public health. Activating networks for consultation and collaboration to ensure the diffusion and feasible implementation of policies from one country to another. Co-operation and coordinated efforts to limit legal and illicit cross-border advertising and trade as well as other phenomena that cause challenges to tobacco prevention across the countries.
Consistent implementation of advanced tobacco policies across the countries Increasing implementation of the advanced measures recommended by the WHO FCTC, such as comprehensive outdoor smoking bans, plain packaging, flavour bans on all tobacco and nicotine products, bans on distance purchasing, and a minimum age of 20 or 21 years for sales.	**Europe** Nordic countries' active participation in developing the international and European regulations, policies, and policy guidelines (WHO FCTC, EU directives), for instance: 1. Investing in continuous production of scientific evidence to back up the global and European policy agreements. Strengthening the international requirements and guidance for policy implementation, especially the national strategies to provide protection from the tobacco industry in line with the WHO FCTC (Article 5.3.). 2. Advocating for extending TPD and TTD to cover all tobacco and nicotine products and strengthening the overall requirements of TTD. Supporting the revision of TAD to also cover contemporary advertising channels such as social media and packages of all tobacco and nicotine products.

EU: European Union; HiAP: health in all policies; TAPS: tobacco advertising, promotion and sponsorship; TPD: Tobacco Products Directive; TTD: Tobacco Taxation Directive; WHO FCTC: World Health Organization Framework Convention on Tobacco Control.

Beating Cancer Plan [1] and its implementation roadmap [69] could encourage the better integration of HiAP at the national and Nordic levels.

The WHO FCTC and EU directives on tobacco products (TPD), taxation (TTD) and advertising (TAD) have harmonised tobacco policies in the Nordic countries in recent decades and ensured that the core preventive measures are in place, such as the 18-year age limit for sales, indoor smoking bans in public places and warning labels on tobacco packages. A recently published assessment on the WHO FCTC's impact on tobacco control progress in 12 countries [70] supports our interpretations on the significance of the shared standards by indicating that the WHO FCTC had broadened political support for tobacco control, urged cross-sectoral collaboration, promoted the strong role of civil society and provided a comprehensive roadmap of legal obligations used by governments and courts to overcome the tobacco industry's interference with the introduction of new policies [70]. However, despite the recent important decisions on the application of the provisions to novel products such as HTPs, more comprehensiveness is still needed,

as countries are currently only invited to consider regulating e-cigarettes [24].

Despite the various benefits of EU directives, they also lack strength and provide only limited support, especially for countries with stronger tobacco control. This has led to policy differences and shared deficiencies in the Nordic countries, which are seen especially in the regulation on novel products and advertising in social media: the TPD does not extend to all novel and emerging tobacco products [40], the TTD lacks effective and consistent tax and price measures and regulation on novel nicotine products [38], and the TAD does not cover new global marketing channels such as social media [39]. Concerns over industry interference have resurfaced in the light of the TPD revisions, as a recent report reveals contacts between the tobacco industry, its allies and pro-vaping groups and the European Commission [71]. Strict compliance with WHO FCTC Article 5.3 should be enforced during the TPD revisions. In addition, countries should not be forced to hinder or delay their policy implementation due to TPD, which was seen in our results with a ban on domestic sales

on novel products and a ban on flavours in smokeless tobacco products.

Nordic collaboration and participation in reinforcing the European regulations, resources for networking between the national tobacco control actors and national regulations to provide protection from the tobacco industry's interference are needed to implement more comprehensive preventive tobacco policies in the Nordic countries. Potential strategies for facilitating the process are demonstrated in Table II. These strategies may also support implementation of other significant supply and demand reduction policies, such as the monitoring of tobacco use (WHO FCTC Article 20), cessation support (WHO FCTC Article 14) and preventing the illicit trade of tobacco (WHO FCTC Article 15).

This is the first extensive preventive tobacco policy comparison in the Nordic countries that is based on the official documents on tobacco policy implementation. The policy comparisons illustrate the situation in 2020–2022 and may quickly change as new regulations are enacted. We were able to identify many potential determinants of policy adoption and implementation, yet certain aspects and data may be better represented than others, as the countries varied in terms of publicly available and easily accessible data. In this study, we assessed policy implementation with regard to national legislation and regulations, yet future studies should also focus on assessing the practical implementation and enforcement of these policies. In this process, attention should also be paid to the impact of countries on each other.

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Availability of data and materials

The datasets supporting the conclusion of the article are publicly available in the WHO FCTC implementation database and in the WHO Global Tobacco Epidemic 2021 report and web annexes.

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Supplemental material

Supplemental material for this article is available online.

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