Psychosocial Vulnerability Underlying Unhealthy Behaviours in Swedish Adolescents

ULRICA PAULSSON DO
The overall aim was to examine the relationship between Swedish school adolescents’ health-related behaviours and psychosocial and socio-demographic factors, with the purpose of identifying vulnerability factors for unhealthy behaviours and exploring adolescents’ own experiences and thoughts about this.

Three studies were quantitative cross-sectional studies and used data from two different questionnaires. The fourth study was a qualitative study based on focus group interviews. The sample in study I consisted of 13–18-year-old adolescents (n=10,590) and 15–16-year-old adolescents in studies II (n=492), III (n=492) and IV (n=36). The quantitative data were analysed using a number of different statistical methods. Foremost, structural equation modelling was used in studies I and II and Poisson regression analysis in study III. Study IV used qualitative content analysis by Graneheim and Lundman.

The results indicated that nearly 60 per cent of 15–16-year-old adolescents have at least two unhealthy behaviours. Interrelated psychosocial and socio-demographic factors constituted vulnerability for unhealthy behaviours in general in adolescents. Good psychosocial relationships were strongly related with high well-being, whereas poor social relationships and low well-being were associated with unhealthy behaviours in general. Low socio-economic group was associated with unhealthy behaviours in general but the strength of this association varied between the adolescent age groups. Encouragement from parents to adopt healthy behaviours was associated with less unhealthy behaviours. Having adolescents who cared about what their parents said regarding health-related behaviours was also associated with a lower number of unhealthy behaviours. The school and family were important social environments for adolescents’ health-related behaviours. Similarly, friends and social media were important social contexts. Fellowship, and close social relationships, in particular, was important to healthy behaviours. Fellowship with others was also stated to influence high well-being. The experience of feeling pressure was stated to be associated with low well-being and unhealthy behaviours in adolescents.

The thesis brings new knowledge to the field of psycho-social and socio-demographic factors associated with unhealthy behaviours in Swedish adolescents. Findings may be useful in supporting adolescents to reach positive health-related behaviours.

Keywords: Adolescents, Health-related behaviours, Social environments, Social relationships, Socio-economic status, Unhealthy behaviours, Vulnerability, Well-being

Ulrica Paulsson Do, Department of Public Health and Caring Sciences, Box 564, Uppsala University, SE-75122 Uppsala, Sweden.

© Ulrica Paulsson Do 2018

ISSN 1651-6206
urn:nbn:se:uu:diva-347828 (http://urn.kb.se/resolve?urn=nbn:se:uu:diva-347828)
To Olivia and Alexander
List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.


Reprints were made with permission from the respective publishers.
Contents

Introduction ................................................................................................... 11  
Background .............................................................................................. 11  
Health and well-being .............................................................................. 11  
Unhealthy behaviours .............................................................................. 12  
Lifestyle and environment ........................................................................ 12  
Micro and macro environments ................................................................ 13  
Welfare state models ................................................................................ 13  
The Social Model of Health ...................................................................... 14  
Age and health .......................................................................................... 14  
Adolescents´ vulnerability to unhealthy behaviours ................................ 14  
Swedish adolescents´ health-related behaviours and well-being .......... 15  
Gender ...................................................................................................... 16  
Socio-economic group .............................................................................. 16  
Vulnerability ............................................................................................. 17  
The Individual Health Behaviours Model ................................................ 17  
Psychosocial factors and adolescents´ health-related behaviours ............ 18  
School programmes for healthy adolescents ............................................ 18  
Social capital ............................................................................................ 19  
Antony Morgan´s Social capital framework ............................................ 20  

Aims .............................................................................................................. 21  
Overall aims ............................................................................................. 21  
Specific aims ............................................................................................. 21  

Methods ........................................................................................................ 22  
Design ...................................................................................................... 22  
Study samples ........................................................................................... 22  
Study I .................................................................................................. 22  
Studies II and III .................................................................................. 24  
Study IV ............................................................................................... 24  
Procedure and data collection ................................................................... 25  
Study I .................................................................................................. 25  
Studies II and III .................................................................................. 25  
Study IV ............................................................................................... 26  
Measures .................................................................................................. 27  
Study I .................................................................................................. 27
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI-C</td>
<td>Eating Disorder Inventory-Children</td>
</tr>
<tr>
<td>HPS</td>
<td>Health Promoting Schools</td>
</tr>
<tr>
<td>HBSC</td>
<td>Health Behaviour in School-aged Children study</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
</tr>
<tr>
<td>SES</td>
<td>Socio-Economic Status</td>
</tr>
<tr>
<td>SKL</td>
<td>Swedish Association of Local Authorities and Regions</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
Introduction

Background
My interest in health started already in upper secondary school, and it was the topic for my special project during the last year. A few years later, after taking some different university courses in varying areas, I knew that I wanted to study and work within the health field and moved to London to study health promotion. During my education in London, studying health promotion, my interest in children and adolescent health was born. I felt that children and adolescents were the most important groups for health promotion to establish a healthy population with long lives. Back in Sweden, I continued my studies with a master’s degree in health promotion, where my master’s thesis was about five-year-old children’s health and well-being. It aroused my interest in also studying adolescents to understand what happens during those critical years when not only health-related behaviours, such as diet and physical activity are important but also when smoking and alcohol are often introduced. My PhD studies later gave me the chance to explore this area. Today, I have children of my own, so children and adolescents’ health and well-being are even more important to me. As a mother, I have seen and reflected a lot upon the importance of social relationships for children’s well-being, which has deepened my interest in children and adolescents’ social relationships and its association to their well-being and health.

Health and well-being
Earlier, health was merely defined as the absence of disease, whereas, today, it is defined as also including an experience of well-being (1), which could be explained as a state of satisfaction with life and positive emotions (2, 3). One of the most commonly used concepts of health is that defined by the World Health Organization (WHO). WHO defines the concept of health as a "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (4).
Unhealthy behaviours

An unhealthy lifestyle can lead to several serious widespread diseases (5). Lifestyle may be defined as a bundle of habitual behaviours in an individual but also includes reasoned actions (6). The theory of reasoned action explains how individuals make decisions to adopt certain behaviours based on the expected outcome (7). Smoking, alcohol consumption, low engagement in physical activity and unhealthy eating patterns together make up four of the most important unhealthy behaviours affecting the health of humans (8-10) and contribute most to diseases in Sweden (11).

The World Health Organization (12) report that 70 per cent of all deaths in the world are from non-communicable diseases, such as cardiovascular disease, cancer and type 2-diabetes, and that healthy behaviours can prevent these diseases to a great extent. Research presents that smoking increases the risk for 58 different medical conditions (13), and it can aggravate many diseases (14, 15). Alcohol consumption is connected to liver diseases, mental ill-health and disease of the nervous system (16). Alcohol consumption is also associated with traffic casualties, violence and suicide (17). A sedentary lifestyle can lead to number of health problems (15, 18) and, similar to smoking and alcohol consumption, increases the risk of mortality (18). It is also associated with overweight and obesity (19, 20). Unhealthy food choices and irregular meal frequency are also risk factors for obesity, which increases the risk for cardiovascular diseases, some types of cancer and type 2 diabetes, among others (21).

Lifestyle and environment

Mark Lalonde, who was the Minister of National Health and Welfare in Canada in 1974 (22), acknowledged that to improve the health of the public, one needs to look beyond the biomedical health-care system as the primary factor for health and instead place emphasis on other determinants of health (23). He wrote the Lalonde report (A new perspective on the health of Canadians) (22), in which he suggested that determinants of health can be categorised into four different fields, including human biology, health-care, lifestyle and environment. Lalonde discussed the role of environmental factors in influencing people’s health and deviated from the previous view of health as a primary outcome of medical care (22). Health promotion was defined as the art and science of helping people to get a healthy lifestyle for optimal health (24). The Lalonde report, which is considered to have led to the development of health promotion (25), proposed that it was people’s own responsibility to maintain a lifestyle in order to be healthy but also put forward
the need for healthy communities and environments for a healthy population (22).

Micro and macro environments

The lifestyle concept was developed through the two “areas” of the individual (micro) and the society (macro) (26). The micro environment refers to the interaction that individuals have with the social environments surrounding them, such as the family, school or workplace. These micro settings are influenced by broader macro environments in the society, such as the welfare state regime in the country one lives in (26). At the Macro level, health inequalities are connected with the welfare arrangement in the country one lives in (27-29).

Welfare state models

The Nordic countries, such as Sweden, Norway, Denmark and Finland have a model called the Social Democratic welfare state model (Scandinavian model). As stated by Esping-Andersen (30), there are three welfare state regime types, including the conservative model, the liberal model and the Scandinavian model. Countries such as Austria, Germany, Italy and France have the conservative welfare regime, which preserves “the traditional family-hood” with family benefits that encourage motherhood and where family services such as day-care are underdeveloped (30). The liberal model, which is practiced in, for example, the United states and Australia, has a work ethic norm and predominately has modest social-insurance plans and modest benefits (30). Among the three welfare regime models, the Scandinavian model stands out. As opposed to the other two models, it is characterised by egalitarian institutional features that pursue equality with full social rights (30). It has shown to produce egalitarian outcomes, which is proposed to be an underlying reason for the high levels of well-being and healthy behaviours in the Swedish population and its neighbouring countries (31, 32). However, there are still health inequalities in the Nordic countries (33). Although the public health goal in Sweden is to shape fundamental conditions for the whole population to give everyone the same opportunity to live healthy lives (34), health differs between groups (33, 34). The health of an individual is influenced by numerous factors, such as biological, economic, environmental and social (34).
The Social Model of Health

The Social Model of Health (35) describes variables that have influence on health and well-being. The model presents the association of health and well-being with social, economic and environmental characteristics and moves beyond the more traditional view of simply biological and medical factors for health. Factors are explained as ‘layers of influence’.

One layer is factors that can be addressed by political actions, such as socio-economic disparities. A global example of that is the Commission on social determinants of health, (also called the Marmot commission) (29), which was established by WHO in 2005, to promote equal health globally. Similarly, a national example is the establishment, by the Swedish government, of a commission for equality in health in 2015, which aimed to increase equality in health between groups in Sweden (36). A second layer in the social model of health is living and working conditions that can be addressed by public health strategies. For adolescents, this means the school environment, for example. A third layer is social environments, such as family and peer relationships. It refers to the micro environment and the interaction that individuals have with other people in different social environments. A final layer is individuals’ health-related behaviours. Factors such as age, sex and genetics are described as fixed factors that cannot be changed.

Age and health

The fixed factor, age, is associated with the health of humans. There are inequalities in health depending on age (33), where three age spans may be considered as being vulnerable (37). Elderly are at risk for poor health because of their lower level of physical ability (37) and their need for support and care (38). Children are also a vulnerable group, as they are dependent on adults for care (37). The last group is adolescents, who are at risk because adolescence is a phase when one is more susceptible to and more likely to expose yourself to more risks (37, 39).

Adolescents’ vulnerability to unhealthy behaviours

Adolescence has been defined as the time from when an individual reaches puberty and starts developing physically and psychologically until reaching full length and maturity (40). Adolescence is a period in life when unhealthy behaviours evolve (15, 41), as values (42, 43) and lifestyle (15), and the physical and mental health (44) are, to a great extent, developed during this time. The health-related behaviours of adolescents become set for adulthood
Most smokers and alcoholics become addicted during adolescence (48), and the weight status of children and adolescents are important predictors of their weight status as young adults (49). This makes adolescence a very important phase in life when it comes to health-related behaviours. Siegrist and Marmot (50) describe adolescence as a ‘critical period’ when exposures can have either adverse or protective effects. It is a phase in life that includes bodily, psychological and social changes (48).

**Swedish adolescents’ health-related behaviours and well-being**

Swedish adolescents generally have good health and health-related behaviours when compared internationally. Swedish adolescents have low numbers of health-damaging behaviours, such as smoking and drinking alcohol. Except for the fruit consumption being low, eating habits of Swedish children are also good when compared with other countries. However, Swedish adolescents report a low level of physical activity. Only 10 per cent of 15-year-old girls and 15 per cent of 15-year-old boys in Sweden meet the recommended level by WHO of moderate to vigorous physical activity per day. Furthermore, Swedish adolescents watch more television than adolescents in many other western countries (33). Poor mental well-being is also worrying and is increasing in Sweden (51). The number of adolescents with psychological or somatic difficulties is higher among girls (5). Whereas nearly 60 per cent of 15-year-old girls report to have frequent psychological or somatic difficulties, the number for boys is just over 30 per cent (51). The well-being of adolescents has been connected with their health-related behaviours (52-54).

Although Swedish adolescents have rather good health-related behaviours in general (33), there are groups of adolescents that are more vulnerable to unhealthy behaviours than others. The health-related behaviours of adolescents become more unhealthy the older they get during adolescence (33, 45, 55, 56), and it is argued that adolescents value their health based on their degree of school acceptance (57), communication with parents (58), social relationships with parents and peers (57, 59, 60), self-esteem (58, 61, 62) and socio-economic status (63). Low self-esteem is considered to be an important factor for low well-being (61, 62) and unhealthy behaviours (37). There are also gender differences in adolescents’ health-related behaviours (33).
Gender

Some health areas are socially acceptable among boys, whereas they are not among girls and vice versa. There are gendered norms for health-related behaviours during adolescence. Historically, it has been more socially acceptable for boys to smoke cigarettes than for girls, for example. Today, it is more common for girls to smoke. Differences in health-related behaviours are found between boys and girls at an early age. These differences still continue to be present in adulthood (64). Studies of adolescents present that being female is associated with unhealthy behaviours today (33, 48). Teenage boys are, for example, more physically active than girls (33, 48). Another important factor for health-related behaviours is socio-economic status (65).

Socio-economic group

Individuals with higher socio-economic position generally have better health than individuals with lower socio-economic position (29, 36, 51). This social gradient of health has been known for a long time (66, 67). In 1984, convincing evidence of this was presented in the British Whitehall studies (67). Socio-economic status refers to areas such as education level, salary and occupation (68). People with less education generally have poorer health than people with higher education, for example. Traffic casualties, suicide, alcohol-related diagnoses, cardiovascular diseases and cancer are all examples of causes of death that are more common in this group. There are a number of reasons as to why socio-economic circumstances affect health. One is that lower socio-economic status generally includes higher economic vulnerability (11) and less control over one’s life situation (21), which could cause stress.

The socio-economic status of a family affects the health of the children (65, 69) and adolescents (64) in the family as well as the adults. Although Sweden has a well-organised welfare system, there are still significant differences under which economic circumstances children grow up (70, 71). These differences have increased among adolescents in Sweden (64). Socio-economic status has an influence on children’s health-related behaviours (65). Children in lower socio-economic groups are, for example, less physically active than children in higher socio-economic groups (72). The reason for this may be the lack of economic resources in the family that limit certain activities (65). Other reasons for poorer health-related behaviours among children in lower socio-economic groups may be that their parents have less healthy behaviours than parents in higher socio-economic groups. The low education level of parents may affect their health-related behaviours; moreo-
ver, it may affect the ability to absorb health promoting messages for chil-
dren, which may have effects on the children. Furthermore, the stress experi-
enced by parents in low socio-economic groups may also be experienced by
their children (69).

Vulnerability
The accumulation of factors that increase the risk for unhealthy behaviours
has been described as generating a state of vulnerability (73). In the same
way that girls seem to be more vulnerable to unhealthy behaviours than
boys, increased age during adolescence and low socio-economic position
during adolescence indicates vulnerability for unhealthy behaviours (41).
Although there is no explicit consensus regarding the definition of the term
`vulnerability`, it may be described as susceptibility to poor health (37, 38)
or state, which is generated from the presence of factors that increase the risk
for unhealthy behaviours (73). Being in the upper teens, female and having a
low socio-economic status may therefore all be socio-demographic charac-
teristics, which generate vulnerability in adolescents. Vulnerability to un-
healthy behaviours is also associated with psychosocial factors (33).

The Individual Health Behaviours Model
The Individual Health Behaviours Model, as presented by Shi and Stevens
(37), suggests that individuals with many psychosocial vulnerability charac-
teristics, engage in more health-damaging behaviours, such as smoking and
excessive alcohol consumption, and less in health-enhancing behaviours,
such as regular physical activity and healthy eating habits, than others. The
model builds upon ideas presented in the Lalonde report (22) and describes
vulnerability characteristics, including poor social relationships and social
support, low self-esteem, low sense of control in life as well as other possi-
ble stressors in life that limit the individual’s social resources. The individual
health behaviours model (37) describes these vulnerable characteristics as
psychosocial stressors that are barriers for engagement in health-enhancing
behaviours and that lead to the adoption of health-damaging behaviours. In
this sense, they are regarded as vulnerability factors for unhealthy behav-
ioirs.
Psychosocial factors and adolescents’ health-related behaviours

Aday (74) describes psychosocial vulnerability characteristics as lack of certain social and personal resources that are important to an individual’s well-being. Social relationships include the level to which a person is embedded in the community, which is an important aspect of the social environment and vital for the health and well-being of an individual (75). Whereas poor social relationships are related to unhealthy behaviours in adolescents (76, 77), good social relationships are identified as a psychosocial factor for health-enhancing behaviours (37, 78). Psychosocial relationships may be described as the level of trust in others, whether you have close friends, if you tell others about your personal thoughts and feelings and let other people get to know you well (79).

Adolescents’ health-related behaviours do not only differ between countries but may also differ in different social environments. The family plays an important part in connection to unhealthy behaviours in adolescents (73). The family and the relationship that adolescents have with their parents is an important social environment. Although many children in Sweden get along well with their parents and can easily talk to them about their problems (33, 64), it was earlier reported that the quality of the relationship between children and their family and peers is low in Sweden compared to other countries (80).

Communication is part of social relationships. It has been found that communication and supervision from parents protect adolescents from unhealthy behaviours (73) and that attitudes towards acceptance of unhealthy behaviours by parents are associated with an increase in unhealthy behaviours in adolescents (73). Communication with parents during adolescence has also been found to be associated with self-esteem and well-being (58), and earlier studies have found that parents telling their adolescent children not to smoke or consume alcohol greatly affects the children’s behaviour (81, 82).

In addition to family, the school is another important social environment for adolescents, where they spend a lot of time. The psychosocial environment in school is also important for adolescents’ health (83).

School programmes for healthy adolescents

The Swedish parliament (64) stress the importance of addressing adolescents as an important vulnerable population in the public health work in Sweden, as the health-related behaviours during adolescence lay the foundation for
the health-related behaviours in adulthood and have an impact on health for the rest of one’s life. According to the Education Act in Sweden (84), the public school should provide psychological and psychosocial health promoting interventions, and school health efforts should be health-promoting and preventive by, for example, provide environments that promote health.

Since adolescents spend so much time in school, this is an important arena for adolescents’ social relationships and to health. The adolescents need to handle relations with both teachers and peers, and these relationships can be both positive and negative for the adolescents’ health-related behaviours (37). Research have found that adolescents’ relationship with their teachers at school is related to their health and school performance (85, 86). Health-promoting schools (HPS), which focus on a healthy school environment to improve health-related behaviours in adolescents (87), have included several aspects of the Individual Health Behaviours Model. Health-promoting schools try to infuse adolescents with healthy behaviours by a health-promoting setting, including strengthening of self-esteem, social relationships and well-being (88, 89); moreover good social relationships between adults and children have been stressed (90). The HPS network, which belonged to the European Network of Health Promoting Schools, started in 1991 (91, 92). However, there is no longer a national organisation for HPS in Sweden. The responsibility for the network was shifted between different authorities, which resulted in a loss of engagement from the network (89). To influence adolescents’ health-related behaviours, many schools in Sweden today have an annual week dedicated to the theme of health, which is organised individually by each school (93). However, these health-themed weeks have not been evaluated scientifically.

Social capital

Social capital is a concept that refers to the way in which health and well-being is related to social environments (such as school for adolescents) surrounding an individual and concerns the social networks between individuals (94). One of the most famous researchers in social capital is Robert Putnam who refers to social capital as social networks and the norms that arise in these networks (95, 96). Social capital can be referred to as social relationship within family, among friends, in school, among neighbours and within social media communities on the Internet, for example (95, 97). A fundamental aspect of social capital is social trust (96, 98) or trustworthiness, which is “the belief that others around you can be trusted”, and some include the concept of social trust in social capital. Halliwell and Putnam (95), however, define them as two different concepts, recognising social trust as almost being related to social capital. Physical and mental health have been
found to be associated with social capital and health-related behaviours, and
social support has, for example, been found to be related to social capital in
adolescents (52, 99).

There are two types of social capital, including bonding and bridging social
capital. Bonding social capital is about similarities in a group of people that
strengthens the cohesiveness in the group but can lead to tension between
groups. Bridging social capital instead decreases tension between groups, as
it interconnects individuals from different groups, which opens up for possi-
bilities that otherwise would not be possible (100).

**Antony Morgan´s Social capital framework**

A health model, which is built upon social capital among adolescents is the
Social Capital framework by Morgan (52). This model proposes that adoles-
cents do not develop their health-related behaviours in isolation; instead,
they are developed in relation to the social environments that surround ado-
lescents (such as the school, family, friends and the neighbourhood). This is
acknowledged in the social capital framework by Morgan (52), who discuss-
es is a model that attempts to explain health, well-being and health-related
behaviours in adolescents. It is a model that was first developed for use as an
analytical framework in an English HSBC study to analyse links between
social capital and health. Morgan (52) used the framework to study the effect
of social capital on adolescents’ health and health-related behaviours after
adjusting for SES, gender and age. In the model, Morgan (52) acknowledged
indicators of social capital, such as sense of belonging, social networking
and social support as being important for adolescents’ health-related behav-
iours.
Aims

Overall aims
The overall aim of this thesis was to study the relationship between Swedish school adolescents’ health-related behaviours and psychosocial and socio-demographic factors, with the purpose to identify vulnerability factors for unhealthy behaviours and to explore adolescents’ own experiences and thoughts about this.

Specific aims
- To analyse interrelated relationships of psychosocial- and socio-demographic factors for unhealthy behaviours
- To explore associations among multiple unhealthy behaviours in adolescents and whether adolescents care about communicated health information from parents and teachers in schools with and without annual health themed weeks.
- To explore Swedish adolescents’ experiences and thoughts about social relationships in different social environments and their associations with health-related behaviours.
Methods

Design

Both quantitative and qualitative methods were used to investigate the relationship between adolescents’ health-related behaviours and psychosocial and socio-demographic factors. Studies I, II and III use a cross-sectional design, and study IV is a qualitative study with an explorative design. Table I presents the designs and samples of the four studies.

<table>
<thead>
<tr>
<th>Study I</th>
<th>Studies II and III</th>
<th>Study IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Quantitative cross-sectional</td>
<td>Quantitative cross-sectional</td>
</tr>
<tr>
<td>Data collection</td>
<td>Questionnaire</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>Number of participants</td>
<td>10,590</td>
<td>492</td>
</tr>
<tr>
<td>Response frequency</td>
<td>86%</td>
<td>61%</td>
</tr>
<tr>
<td>Participants</td>
<td>13–18 year old adolescents in Uppsala county</td>
<td>15–16 year old adolescents in nine geographically spread municipalities in Sweden</td>
</tr>
</tbody>
</table>

Study samples

Study I

In study I, the questionnaire was distributed to all pupils in school grades seven (13–14-year-olds) and nine (15–16-year-olds) in upper primary school and in grade two in upper secondary school (17–18-year-olds) in all upper primary schools and upper secondary schools (except for special needs schools) in the county of Uppsala in Sweden. There was a total of 12,312 adolescents, who were eligible to participate in the study. Out of these, 10,590 pupils participated in the study (86%). The 14 per cent who did not complete the questionnaire were absent from class or from school on the day the questionnaire was distributed.

Study I had a larger sample of pupils living in urban municipalities compared to the national average (Table 2) (101). Furthermore, the education level of parents of pupils in grade 9 was slightly higher at the schools included in the study (102). The number of pupils with passing graduating certificates in grade 9, however, was similar for the schools in the study and the national average (103).
<table>
<thead>
<tr>
<th></th>
<th>National average:</th>
<th>Sample Study I:</th>
<th>Sample Studies II and III:</th>
<th>Sample Study IV:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban municipalities*</td>
<td>51%</td>
<td>74%</td>
<td>49%</td>
<td>100%</td>
</tr>
<tr>
<td>Non-urban municipalities**</td>
<td>49%</td>
<td>26%</td>
<td>51%</td>
<td>0%</td>
</tr>
<tr>
<td>Passing leaving certificates in 9th grade***</td>
<td>2007: 76%</td>
<td>73%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009: 77%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level of parents****</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016: 74%</td>
<td></td>
<td></td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>2007: 2.2</td>
<td>2.3***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009: 2.2</td>
<td></td>
<td>2.1***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016: 2.3</td>
<td></td>
<td></td>
<td>2.0***</td>
</tr>
</tbody>
</table>

* Municipalities with a population of at least 50,000 people and municipalities near such cities, where commuting to the city for work is common (as defined by the Swedish Association of Local Authorities and Regions, Kommungruppsindelning 2011).

** Municipalities with a population of less than 50,000, where it is not common to commute to an urban municipality (as defined by the Swedish Association of Local Authorities and Regions, Kommungruppsindelning 2011).

*** Based on the schools included in the study, a mean was calculated for the study sample from the number of pupils at each school (Swedish National Agency for Education, http://siris.skolverket.se/siris/?p=5IRIS:1640::NO::: . Accessed 21 March 2018).

**** Based on parents of pupils who completed school grade 9. Level 1 means completion of nine years of compulsory school, level 2 means completion of upper secondary school, and level 3 means having post-secondary education.
Studies II and III

A total of 161 municipal upper schools were asked to participate in this study. These were strategically selected for a geographical and socio-demographical spread and included both urban and non-urban-populated municipalities (as defined by Swedish Association of Local Authorities and Regions (SKL)) (101). Nineteen schools in 14 municipalities agreed to participate. Ten secondary schools were included in the study. They represented an equal distribution of schools and pupils in both urban and non-urban-populated municipalities, which were geographically spread out in Sweden (from a municipality in the county of Jämtland in the north to two municipalities in the county of Skåne in the south). The study aimed to have an equal number of schools and number of pupils in schools that had a health focus (yearly health-themed events lasting 4 days to 1 week) and schools that did not have a health focus (52.1% of the pupils in non-urban municipalities and 66.7% of pupils in urban municipalities went to schools with a health focus). The questionnaires were distributed to the schools (805 pupils) and were answered by 492 pupils (61%). Non-responses were due to one school failing to return their questionnaires (123 questionnaires), teachers failing to distribute the questionnaires (151 questionnaires) and pupils being absent on the particular day that the questionnaire was distributed (39 pupils).

The study sample was representative of the Swedish population with regard to geographical spread and number of pupils with passing graduating certificates in grade 9 (Table 2). The education level of parents was slightly lower than the national average.

Study IV

Thirty secondary schools were asked to take part in this qualitative study in the municipality of Uppsala, Sweden. Schools were purposefully selected to include both urban (two schools) and rural (one school) locations, including both adolescents born in Sweden and adolescents with immigrant backgrounds in both types of areas. The purposeful selection of schools was also performed to include a socio-demographic spread among the adolescents included in the study. School principals were contacted regarding participation in the study. Out of the four schools that wanted to participate in the study, three schools were purposefully selected to participate. A total of 36 pupils (23 girls and 13 boys) aged 15–16 years in school grade 9 participated in the study. Seven focus group interviews were conducted. Four of them were performed with girls and boys (with a minimum of two for each gender), whereas two groups only included girls and one group only boys.
A total of 39 per cent of the adolescents went to school in the city of Uppsala (150,000 inhabitants) and 61 per cent of the adolescents went to school in a village in the countryside outside the city of Uppsala, with approximately 500 inhabitants. However, this village is in the municipality of Uppsala, which is an urban municipality. The number of adolescents with passing graduating certificates in grade 9 was higher at the schools included in study IV than the national average (Table 2). The education level of parents, however, was lower in this study sample.

Procedure and data collection

Study I

Study I was based on data collected from a paper-and-pencil questionnaire called ‘Life and Health – Young People’ (Liv och Hälsa – Ung). It was distributed during ordinary classes in May 2007 by Uppsala county council in Sweden and aimed to collect information about adolescents’ health, living habits and the essentials of life. This questionnaire has been distributed to adolescents every second year in several counties in Sweden since 1995 and has been used in other published studies (104-108). The questionnaire consisted of 86 items for adolescents aged 13–14 years and 136 items for adolescents aged 15–18 years. These items were based on the Survey on Living Conditions (109), Health on Equal Terms (110), Alcohol Use Disorders Identification Test (111-113) and the Annual National Study of Alcohol and Drug Habits of School Children (114). Fifteen items in the questionnaire were used in the study. These questions have been used in earlier published studies (104, 105, 114, 115).

Studies II and III

Studies II and III are both based on a self-report paper-and-pencil questionnaire compiled by the research team at the Department of Public Health and Caring Sciences at Uppsala University. This questionnaire contained 82 questions and aimed to collect information about adolescents’ health behaviours and possible vulnerability for unhealthy behaviours. The questionnaire included questions from the ‘interpersonal distrust’ and ‘ineffectiveness’ subscales from the instrument ‘Eating Disorder Inventory-Children’ (EDI-C) (79), Swedish version (116), which is an instrument that includes 11 different subscales (79, 117) that have been used in earlier published studies (118-120). The questionnaire also included items from the ‘Life and health – Young People’ (‘Liv och hälsa – Ung’) questionnaire. Some questions were developed for the questionnaire by the research team. One of the newly developed questions was used in study II (‘How often do you feel that you
Before the questionnaire was handed out to the adolescents in the study, a pilot study was conducted in a school class (grade nine) with 20 pupils to ensure the validity of the questions. The school was in a sparsely populated municipality, and the school class was not part of the study. Pupils were encouraged to ask questions about the questionnaire if they had any inquiries regarding them or the response alternatives. A retest was performed in this school class to ensure reliability of the newly developed questions in the questionnaire. The test-retest analysis was performed in SPSS, using cross-tabulation and Spearman correlation. The reliability of the new questions was adequate. A few questions and answering alternatives were slightly modified. To test the validity of the reformulated questions, a pilot study was performed in four school classes in school grade nine.

A short questionnaire with three questions was sent to principals who had agreed to let their school participate in the study. The short questionnaire asked about whether or not the school had a health focus (‘Do you have theme-days on the topic health (outside of the ordinary education) regularly at your school? (State the number of days that each pupil is engaged)’ and ‘According to which models are you addressing health issues at your school?’) and whether they were interested in letting their pupils answer the enclosed questionnaire (‘Are you interested in letting your pupils fill in a questionnaire about health-related behaviours?’). Out of the 19 schools, there was a strategic selection of schools to be included in the study. Ten schools (in nine municipalities) were selected. Schools with a health focus were included in the study in order to have a variation in the sample, with regard to health knowledge and possibly health behaviours. The questionnaire was handed out to the pupils by teachers and was completed by the pupils in the classroom during ordinary class hours. Questionnaires were returned to the researcher in June 2009.

Study IV
Study IV is based on qualitative interview data. A pilot focus group interview was conducted with four adolescents in March 2016. It was performed to test the questions in the interview guide and to test the interview setting as well as to get the adolescents input on the questions. The pilot study resulted in some changes to the interview guide. A restructuring of the interview questions was performed, and social media as a social context was added.

Principals asked teachers to orally inform pupils in school grade nine about the focus group interviews during class hours and to hand out the written
information about the study. Those adolescents who wanted to take part in
the study informed their teacher or the research team. Letters with infor-
mation about the study was forwarded to the adolescents’ parents.

The focus group interviews were performed in spring 2016 and included 4–6
adolescents per group. The interviews were audio-recorded and took place in
conference rooms, at the pupils’ schools during school hours. The interviews
started with informal small talk, and the adolescents were served muffins
and juice to make them feel comfortable in the situation. The researcher,
who held the interviews, informed the adolescents about the study both oral-
ly and by handing out written information that she asked the adolescents to
read through. Before the interviews started, the adolescents were asked if
they had any questions. The focus group interviews lasted between 30 to 90
minutes. The adolescents received a cinema ticket for their participation.

Measures

Study I

Fourteen questions from the ‘Life and health – Young People’ questionnaire
were used in study I (See table 1 in article I). Four health-related behaviours
were investigated, and each behaviour was studied using three questions,
except for smoking, which was measured with one question (‘Do you
smoke?’). Irregular meal frequency was analysed using questions on how
often the pupils ate breakfast, lunch and dinner during an ordinary week.
Physical activity was studied using questions about the level of physical
activity during spare-time. Alcohol consumption was measured by questions
on alcohol consumption behaviour, such as drunkenness, during the last
twelve months. Gender and socio-economic group (parents’ occupation and
type of housing) were included in the study for socio-demographic measures.
Each school grade (grade seven and nine in upper primary school and grade
two in upper secondary school) was analysed separately.

Study II

Twenty-six questions from the questionnaire by the Department of Public
Health and Caring Sciences were used in study II (See Additional file 1 in
article II). Similar to study I, smoking, alcohol consumption, meal frequency
and physical activity were measured. Smoking and meal frequency were
analysed using the same questions as in study I. Alcohol consumption, how-
ever, was studied with the question ‘How often do you drink alcohol so that
you become drunk?’ and physical activity was investigated using the ques-
tion ‘How often do you exercise more than 30 minutes?’ Socio-demographic
measures included in the study were ‘gender’, ‘school-grade’ (age) and ‘self-perceived socio-economic situation’ (‘How often do you feel that you have less money than your peers?’).

Well-being was analysed with two questions (‘How do you feel’ and ‘How satisfied are you with your life?’). Two subscales from the EDI-C instrument (79), Swedish version (116, 119, 120) in the questionnaire were used. EDI-C measures symptoms and psychological characteristics in children and adolescents (79). The Interpersonal distrust subscale (seven items) assessed the quality of adolescents’ social relationships. The seven questions included statements such as ‘I have difficulties telling others how I feel’, which the adolescents were asked to agree (always, usually, often, sometimes) or disagree (never, rarely) with. The Ineffectiveness subscale included ten questions, which assessed self-esteem. The Ineffectiveness subscale included statements such as ‘I do not like myself particularly much’. Like the Interpersonal distrust subscale, the adolescents were asked to agree (always, usually, often, sometimes) or disagree (never, rarely) with the statements. Each answer to the questions in the subscales gave one point. The points were added with a total sum for each subscale, which indicated good or poor social relationships and high or low self-esteem for each adolescent in the study. The Interpersonal distrust subscale and the Ineffectiveness subscale have both validated indexes, where points and scores are calculated in this way to receive an indication of each adolescent’s self-esteem and quality of social relationships (79).

Study III

Thirty-three questions were used in study III (See Appendix in article III). Socio-demographic and health-related behaviour variables were the same as in study II. However, a fifth health-related behaviour variable was added to this study. This variable measured consumption of unhealthy foods. Four questions related to where the adolescents received their main health knowledge (one question for each health-related behaviour). Four questions analysed parental health behaviour communication (one question for each health behaviour area (one question concerning diet)). These questions were formulated as statements and started with the words ‘Agree or disagree with the statement: “My parents tell me to” and ended with, for example, “not consume alcohol”’. The study also included a question regarding how the adolescents received health information in school. Four questions with four sub-questions each concerned whether the adolescents cared about what their parents, teachers/school staff, friends and media communicated regarding health-related behaviours (one question for each behaviour). The sub-questions were formulated as statements (for example, ‘Agree or disagree with the statement: I care about what my parents say about diet’). Each an-
swering alternative was given a score, which together rated how highly the adolescent cared about what his or her parents told him/her about health-related behaviours. This way, rates of how highly the adolescents valued what parents, friends, teachers/school staff and media communicated regarding health-related behaviours in general were determined and those measures were then used in the analysis. The same system was used for the question regarding whether the adolescents received healthy behaviour messages from their parents.

Study IV

An interview guide was used during the focus group interviews. It had three initial questions, including what healthy and unhealthy behaviours meant to the adolescents and what social relationships with other people meant to them. There were a number of follow-up questions that the interviewer asked, if the adolescents had not already discussed those areas. These included what the adolescents thought about regarding eating habits, physical activity, alcohol consumption and smoking and whether social relationships could be good or bad for them.

There were five main questions, where some of them had a number of follow-up questions. Follow up questions inquired about social relationships in different social environments (school, family, friends and social media). Questions are presented in Table 3. At the end of the focus group interviews, the interviewer summarised what had been discussed during the interview and asked whether the participants had anything else they wanted to add.
### Table 3. Interview guide in study IV

<table>
<thead>
<tr>
<th>Question 1.</th>
<th>Which social relationships are important to you?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up question:</td>
<td>Why are these relationships important?</td>
</tr>
<tr>
<td>Follow-up question:</td>
<td>How are these relationships important to your health-related behaviours?</td>
</tr>
<tr>
<td>Question 2.</td>
<td>Do you have examples of relationships that have affected your health-related behaviours for the better or worse?*</td>
</tr>
<tr>
<td>Question 3.</td>
<td>Do you have examples of people with whom your relationship has improved or worsened because you have certain health-related behaviours?*</td>
</tr>
<tr>
<td>Question 4.</td>
<td>What makes you feel that you are part of a group?</td>
</tr>
<tr>
<td>Question 5.</td>
<td>Do your health-related behaviours matter for you to feel that you are part of a group?</td>
</tr>
<tr>
<td>Follow-up question:</td>
<td>Have you been included in a group because you have certain health-related behaviours? How?</td>
</tr>
<tr>
<td>Follow-up question:</td>
<td>Does the group affect your health-related behaviours? How?</td>
</tr>
</tbody>
</table>

* Question was followed up by asking specifically about social relationships with family, friends, at school and on social media.
Data analysis

Studies I and II

First, frequency analyses were performed in studies I and II. The variables that were analysed in studies I and II were latent variables (one to three questions from the questionnaire that were analysed as a single variable (121)). To find out whether these questions (indicating variables) were suitable for analyses together as single variables (first-order latent variables), measurement modelling analysis was used. For example, indicating variables for the first-order latent variable ‘physical activity’ in study I included: ‘physical activity/day except for exercising’, ‘exercise in spare time more than 30 minutes/day’ and ‘organised physical activity during the last twelve months’.

In both studies I and II, whether the four first-order latent variables (the health-related behaviour variables smoking, alcohol consumption, meal frequency and physical activity) were associated with an underlying latent variable, i.e. a second-order latent variable, was tested by using Polychoric correlation analysis.

The third step of the analysis in studies I and II was structural equation modelling (SEM). SEM tests associations between latent variables (122), and there was a hypothesis of associations between latent variables in study I and study II which were tested. (See Figures 1 and 2.)

All analyses were carried out in Lisrel, version 8.80. Pairwise deletion was used to deal with missing values, but mean replacement was used for the ineffectiveness and interpersonal distrust subscales in study II, as commonly used for these subscales [91].
Study III

Associations were sought using the following statistical analyses: cross-tabulation analysis, correlation analysis, univariate and multivariate poisson regression analyses, and additive and multiplicative interaction tests using Poisson regression analyses.

The number of unhealthy behaviours (between 0–5) was the dependent variable in this study, and it was studied in relation to whether parents and teachers told the adolescents that they should have healthy behaviours and how adolescents valued what their parents and teachers said regarding health-related behaviours. Socio-demographic measures and measures of
how adolescents valued what friends and media communicated regarding health-related behaviours were also included in the study and were analysed in relation to number of unhealthy behaviours in the adolescents.

A frequency analysis was performed for all variables in the study. Thereafter, a cross-tabulation analysis was performed to determine whether there were differences between adolescents at health-focused schools and adolescents that did not go to such schools.

Univariate Poisson regression analyses were conducted to measure each variable individually, in relation to the number (0–5) of unhealthy behaviours. In the next step of the Poisson regression analysis, all measures were analysed together (multivariate analysis) to determine which factors were still associated with the number of unhealthy behaviours in adolescents. In the third step of Poisson regression analyses, additive and multiplicative interaction tests were performed to study the number of unhealthy behaviours in adolescents, who were encouraged by their parents to have healthy behaviours as compared to adolescents who were not. These studies were also performed to find differences between health-focused schools and schools with no health-focus.

The correlation analysis was performed to measure the correlation of the two measures regarding whether adolescents cared about what their parents and teachers communicated to them relating to health-related behaviours.

SPSS Statistics 22 was used for all the statistical analyses in study III.

Study IV

For analysing the interviews, qualitative content analysis, as described by Graneheim and Lundman (123), was used. This method systematically analyses content in, for example, interviews and reveals different aspects of a phenomenon (123). The analysis was carried out manually and included a number of main steps. Listening through the audiotaped interviews and reading through all the transcribed interviews several times were the first parts of the analysis process. Then, sections relevant to the study aim were selected, and meaning units were picked out that represented the content in the interviews. The meaning units were then condensed to get the essence from them and were given a code. The codes were placed into different sub-categories that were divided into categories. Finally, themes were developed from these categories. However, the interview material was continuously referred to during this process, and there was a forward and backward movement between themes, categories, sub-categories and the interview material.
One of the authors listened to and read through all the data material several times. All authors independently read through the transcribed material for two of the interviews and selected meaning units; thereafter, they did the condensation, coding and placing of these codes in sub-categories and categories. The authors then discussed the two interviews together. An additional two interviews were analysed independently by two of the authors and then discussed. The last three interviews were analysed by one author but were discussed together with two of the other authors to reach a consensus of categories and themes.

Ethical considerations

The ethical regulations for humanistic and social science research in Sweden were followed in all studies, and the studies followed Swedish law (Law 2003:460). Participants were informed that their participation was voluntary and that they could withdraw from the study at any time without giving any reason for their withdrawal.

In both questionnaires (studies I, II and III), the adolescents were informed about the aims and confidentiality of the study on the first page. The adolescents who answered the questionnaire gave their informed consent. Respondents were anonymous. The ethics committee at the Faculty of Medicine at Uppsala University in Sweden was consulted, and ethical approval was not required.

In the qualitative study (study IV), ethical approval was sought at the Central Ethical Review Board of Uppsala, Sweden, and the review board approved the study (registration number 2016/003). Adolescents were given both oral and written information about the aims and confidentiality of the study and informed that participation was voluntary and anonymous. Parents were given written information about the study and were asked to contact the research team if they did not wish their child to participate in the study. All adolescents who took part in the focus group interviews gave their written consent. Adolescents were informed of the possibility of talking to a nurse or welfare officer in case the interview raised reactions and feelings.
Main results

Study I

Study I analysed how strongly socio-economic status and gender were associated with health-related behaviours (smoking, alcohol consumption, physical activity and meal frequency) in different adolescent age groups in Sweden. (See Figure 1. Model in study I.)

The results presented one model for each age group, which reflected vulnerability for health-damaging behaviours (smoking and alcohol consumption) and non-adoption of health-enhancing behaviours (low level of physical activity and irregular meal frequency), which support the hypothesised model that was tested. Differences were found between the ages during adolescence. Whereas gender and socio-economic status only had low associations with 13–14-year-old adolescents’ health-related behaviours in general, low SES was a vulnerability factor for unhealthy behaviours in general in the 15–16-year-old group. Unhealthy behaviours in general were not associated with any of the genders in this age group. In the oldest adolescents (17–18 years), low socio-economic status and being a boy had low associations with unhealthy behaviours in general. However, being a girl was associated with smoking, irregular meal habits and low level of physical activity. Direct associations between gender and individual health-related behaviours also presented associations between unhealthy behaviours and being a girl in the two younger age groups. However, in the 15–16-year-old group, alcohol consumption was associated with being a boy (although the path coefficient was low). The association between physical activity and being a boy in the 15–16-year-old age group was particularly strong.

Study II

Study II investigated direct and indirect psychosocial and socio-demographic associations with health-related behaviours (smoking, alcohol consumption, physical activity and meal frequency) in 15–16-year-old adolescents in Sweden. (See Figure 2. Model in study II.)
The results presented a model, which illustrated vulnerability for unhealthy behaviours in general. A low level of well-being, poor psychosocial relationships, low self-esteem, low self-perceived socio-economic status and being a girl were vulnerability factors for unhealthy behaviours. The hypothesised model that was tested was confirmed and presented interrelated direct and indirect associations of psychosocial and socio-demographic factors with unhealthy behaviours in general (study II, table 3).

There were some strong associations between the psychosocial variables in the study. High well-being was associated with good psychosocial relationships and high self-esteem. Associations between psychosocial and socio-demographic variables were also found. High well-being and self-esteem were associated with high self-perceived socio-economic status, whereas good psychosocial relationships, high self-esteem and high well-being were all associated with being a boy.

The health-related behaviours also had individual associations with many of the psychosocial factors. High well-being and good psychosocial relationships were associated with physical activity and regular meal frequency, whereas low well-being and poor psychosocial relationships were associated with smoking and alcohol consumption. Low self-esteem was associated with smoking.

Individual health behaviour associations with the socio-demographic factors were also found. High self-perceived economic situation was associated with physical activity and regular meal frequency, whereas low self-perceived economic situation was associated with smoking and alcohol consumption. Being a boy was associated with physical activity and having regular meal habits, and being a girl was related to smoking and alcohol consumption.

Study III

Study III investigated the associations between number of unhealthy behaviours and health information communicated by parents and teachers and how much the adolescents cared about this information and whether or not they went to schools that had an annual health-themed week.

Thirty per cent of the adolescents had one unhealthy behaviour, whereas nearly 60 per cent had two or more. A slightly higher number of adolescents at health-focused schools had multiple unhealthy behaviours (61% had two or more unhealthy behaviours) compared to adolescents that did not go to such schools (56.2% had two or more unhealthy behaviours). The majority of the adolescents reported that they received health information at school,
and nearly half of the adolescents were told by their parents to adopt healthy behaviours. Teachers and parents were the two most common sources of information about health-related behaviours.

Those adolescents that had parents who encouraged them to engage in healthy behaviours had lower number of unhealthy behaviours (paper III, table 3 and figure 2). Nearly 60 per cent of the adolescents that did not attend health-focused schools reported having parents who encouraged them to engage in healthy behaviours, whereas approximately 45 per cent of adolescents at health-focused schools reported the same.

Forty per cent of the adolescents in the study reported that they cared about what their parents said regarding health-related behaviours; in contrast, 20 per cent reported that they cared about what their teachers said with regard to health-related behaviours. Nearly 24 per cent of adolescents at health-focused schools cared about the health behaviour information communicated by teachers, whereas 17.5 per cent did so in the schools without a health focus.

Adolescents who did not care about what their parents said regarding health-related behaviours had more unhealthy behaviours. However, adolescents who did not care about such information from teachers had fewer unhealthy behaviours. Adolescents who cared about what their parents said were less likely to care about health information from teachers.

Study IV

Study IV explored 15–16-year-old adolescents’ thoughts and experiences regarding health-related behaviours and their associations to social relationships in the social environments of school, family, friends and social media. The analysis process resulted in two overarching themes. These were named ‘social context’ and ‘personal management’ and were generated from the seven categories and 21 sub-categories that were found (paper IV, table 3). The theme ‘social context’ had five categories, which all had to do with how the social contexts surrounding adolescents affect their health-related behaviours. School, family, friends and social media were all found to be important social environments for the adolescents’ health-related behaviours.

Fellowship was one of the categories, wherein fellowship with others was described as resulting in emotions such as happiness, and was stated to be related with adolescents’ well-being and health-related behaviours (subcategory ‘emotions’). Having close relationships was viewed as positive for the adolescents’ health-related behaviours (subcategory ‘close relation-
Health-related behaviours were stated to be important for friendship and for whether the adolescents felt they were part of a group of friends or not (sub-category ‘group belonging’). Engaging in health-related behaviour was described as a way to make friends and to be accepted by others in a group as well as a way to ensure that you remain friends with someone or continue belonging to a group of friends. Belonging to a group was very important for adolescents as a way to be physically active. Adolescents stated that they would not go and exercise by themselves. In order to go and exercise, they had to be accompanied by a friend or family member (sub-category ‘fellowship through physical activity’). In relation to fellowship with friends, larger social networks were also mentioned. They were described as bringing other’s perspectives on your health-related behaviours and a wider perspective on health-related behaviours in general (category ‘large social network’).

The adolescents described that they were dependent on others (category ‘depending on the environment’), such as getting practical support from parents by being driven to and picked up from practice. Adolescents stated that parents made choices that affected their habits and preferences when it comes to food. It was also mentioned that health-related behaviours were dependent on the health behaviour information presented by teachers at school. Adolescents expressed that their health-related behaviours were not only influenced by dependence on others but also by other peoples’ engagement in their health-related behaviours, where help, challenges, demands and encouragement were areas that were discussed (category ‘engagement from others’). Pressure from friends, social media and teachers (category ‘pressure’) were expressed to have negative influence on the adolescents’ well-being, physical activity, eating habits and sleep. Pressure was also stated to be associated with smoking and alcohol consumption.

The second theme, ‘personal management’, which was found in study IV included two categories and reflected how the adolescents’ health-related behaviours were shaped by their own means instead of from their social surroundings. The category ‘personal ability’ illustrates adolescents’ courage and approach to standing up against bad influences and how they took their own initiative to engage in healthy behaviours. This theme also reflected
adolescents’ search for identity, where they imitated others’ behaviours and engaged in healthy behaviours to have a “positive” image, or unhealthy behaviours to portray a “cool” image.
Discussion

The overall aim of this thesis was to explore associations between health-related behaviours and psychosocial and socio-demographic factors in Swedish school adolescents, with the purpose to identify vulnerability factors for unhealthy behaviours and to analyse adolescents’ thoughts and experiences regarding this.

The main findings in the thesis can be summarised as follows: the school, family, friends and social media were important social environments to adolescents’ health-related behaviours. Fellowship and close social relationships were expressed as highly influencing adolescents’ health-related behaviours. Poor psychosocial relationships were associated with low well-being and unhealthy behaviours. The experience of fellowship with other people was expressed by adolescents to influence high well-being and healthy behaviours, whereas the experience of pressure from teachers was expressed as resulting in low well-being and unhealthy behaviours. Encouragement to adopt healthy behaviours from parents was instead associated with fewer unhealthy behaviours in adolescents. Adolescents who cared about what their parents communicated to them concerning health-related behaviours had less unhealthy behaviours. It was more common for girls to have unhealthy behaviours than it was for boys. Low socio-economic group was associated with unhealthy behaviours and the strength of this relationship varied between adolescent age groups.

Adolescents is a vulnerable group and the findings in this thesis indicate that nearly 60 per cent of 15–16-year-old adolescents in Sweden have at least two unhealthy behaviours. This is a high number. Adolescence is an important period in life when health-related behaviours are set for adulthood (45-47). Therefore, it is important to invest in adolescents’ health-related behaviours to lay a strong foundation for health in future life. The studies in this thesis have investigated health-related behaviours as a cluster. It has earlier been recognised that adolescent health-related behaviours cluster (124, 125). Regardless, studies of adolescents’ health-related behaviours often include single health-related behaviours (126), and there have been few studies of psychosocial and socio-demographic factors associated with health-related behaviours in general in adolescents in the Nordic countries. Further, studies of the association between health behaviour information at
school and multiple unhealthy behaviours in adolescents have not been explored previously. Similarly, adolescents’ own experiences and thoughts regarding their social relationships and health-related behaviours in Sweden have not been studied earlier. Therefore, this thesis brings new knowledge to the scientific field of health-related behaviours in adolescents in Sweden. One of the most vital findings in this thesis was the importance of social relationships for the health-related behaviours in Swedish adolescents.

Social relationships

The quantitative findings in this thesis indicated that good psychosocial relationships were associated with healthy behaviours and high well-being in Swedish adolescents. Poor social relationships were instead associated with unhealthy behaviours. Adolescents in the qualitative study stated that being close with other people made them feel as if they were cared for and gave them a sense of security. In the qualitative study, adolescents mentioned social support from others to have a positive influence on their health-related behaviours. These findings are in line with the individual health behaviours model (37) and the social capital framework by Morgan (52). The individual health behaviours model proposes that poor psychosocial vulnerability characteristics, such as poor social relationships or a low level of social support, are barriers to engagement in health-enhancing behaviours and that these characters are related to the adoption of unhealthy behaviours (37). Social support is also acknowledged in the social capital framework by Morgan (52) as an important social capital characteristic, which is connected with healthy behaviours and well-being in adolescents.

The importance of adolescents caring about what their parents tell them regarding health-related behaviours should be highlighted. If the adolescents cared about what their parents told them regarding health-related behaviours, it was related with lower number of unhealthy behaviours. Similarly, adolescents expressed that their health-related behaviours were not influenced by others if they did not care about that individual. Hence, it is not only important for parents or other people to engage in and encourage adolescents to adopt healthy behaviours, the quality of the relationship with adolescents are vital too. The importance of a close relationship was mentioned in the focus group discussions, and the level of trust in these relationships seems to be essential.

The concept of trust refers to an individual’s belief that he or she can trust other people in the social environments (127), and trust is often regarded as a consequence of social networking (98, 127). Although larger social networks were mentioned as providing a wider perspective on health-related behav-
iours in the qualitative study, the adolescents in the focus group discussions mainly talked about the importance of close social relationships with others similar to themselves. Only 20 per cent of the adolescents cared about what their teachers said regarding health-related behaviours at school. This low number speaks for a lack of trust in teachers. Trust is associated with social networking (127). To increase adolescents’ social trust, there might be a need for increased social networking among adolescents. Increased social networking at school could increase their level of trust in other people in the school environment. Earlier studies have also proposed the importance of good social relationship between teacher and pupil for adolescents’ health (37, 85, 86). The psychosocial school environment is related to adolescents health (83), and good social relationships may also be reached through increased social networking. Whereas poor relationships between teacher and student have been associated with unhealthy behaviours (128), good social relationships have instead been associated with improvement in combating smoking in schools (129, 130).

Through good social relationships, credibility of teachers may increase. It has been argued that adolescents first need to accept their teacher in order for the teacher to be successful in teaching their pupils (131, 132). Furthermore, it has earlier been argued that credibility is essential in communication (133) and that adolescents prioritise different health information sources, depending on how credible they find the source (134). If this is true, it is important for teachers to first get accepted and to then gain credibility from their pupils to care about the health information communicated to them.

**Bonding social capital**

In the focus group discussions, it was mentioned that having a large social network, gives a wider perspective on health-related behaviours, thus influencing ones behaviours. However, the adolescents mainly discussed the importance of having close relationships with other people similar to themselves. They stated the importance of having the same health-related behaviours as others in their social relationships with peers. This suggests that bonding social capital in the form of close relationships may be especially important for adolescents’ health-related behaviours. One setting that stood out in the focus group discussions as particularly important to adolescents regarding social relationships and health-related behaviours was physical activity.
Fellowship and physical activity

Being in fellowship with others was stated as very important by the adolescents in the focus group discussions. Adolescents expressed that they would not go to exercise alone. To be physically active, fellowship was essential. In the quantitative analysis of this thesis, physical activity was strongly associated with being male, whereas being a girl was associated with low level of physical activity. This finding of Swedish boys being more physically active than girls during adolescence is congruent with findings from research presented by The Public Health Agency of Sweden (48). There is a low level of physical activity in Swedish adolescents in general (33, 48), however, which is alarming. Just over 12 per cent of Swedish 15-year-olds meet the WHO recommendation of one hour of physical activity per day (33). Studies outside of Sweden have also found that fellowship with peers is important for physical activity in adolescents (135, 136), which seems to be the case for Swedish adolescents as well.

Sense of belonging

A sense of belonging to a group was expressed by the adolescents in the qualitative study and was stated to be important for the adolescents’ health-related behaviours in general, and not only for physical activity. Morgan acknowledges the sense of belonging in his social capital framework, as an important social capital factor for adolescents’ health-related behaviours. With regard to belonging to a group, adolescents in the focus groups expressed that they engaged in new healthy or unhealthy behaviours to become a member and be accepted by the other peers in the group. To engage in this new behaviour was a way to be part of the group or to continue to stay friends with someone. The importance of relationships with peers increases during adolescence; therefore, exclusion from a group of peers is difficult to accept (137). This reasoning is also explained in the theory of reasoned action (7). Whether to use health-related behaviours as a method for inclusion in a group of peers is a decision the adolescent makes based on the outcome he or she expects as a result of the new behaviour.

Well-being

In the quantitative research, low well-being was a vulnerability factor for unhealthy behaviours in general. The adolescents also stated that they experienced pressure from teachers and social media and that pressure from teachers, in particular, had a negative influence on their well-being. Low mental well-being has increased over the years in Sweden, among young
people (51, 138, 139); additionally, the experience of pressure in Swedish adolescents has been found to be common, particularly among girls (138). Adolescence is a period of great pressures, including growing expectations in school (33). In the social capital framework by Morgan (52), it is proposed that adolescents do not develop their health-related behaviours or level of well-being in isolation but rather through the social contexts that surround them, where school is one important environment for adolescents. Good social relationships with teachers and peers in school have also been found to improve school performance and well-being in adolescents, which indicates the importance of the school environment (138). Furthermore, the school is an arena, which reaches nearly all adolescents; therefore, it is important that the school environment prevents health inequalities in adolescents.

Socio-economic differences in health-related behaviours

In the quantitative studies, differences in health-related behaviours were found between adolescents’ self-rated socio-economic situation and socio-economic status. Differences in health between socio-economic groups are well known (29, 36, 67). In a society such as Sweden, having the Scandinavian welfare state regime (30), which has shown to have egalitarian outcomes (31, 32), adolescents in lower socio-economic groups should have the same opportunities to have healthy behaviours as other adolescents.

In the quantitative research, adolescent age groups were compared according to the importance of socio-economic circumstances for adolescents’ health-related behaviours in general. The strength of the associations between socio-economic groups and health-related behaviours varied between the adolescent age groups, where socio-economic status was found to have the highest association with health-related behaviours in 15–16-year-old adolescents. Similar studies investigating factors associated with multiple health-related behaviours in different adolescent age groups have also found differences between ages during adolescence (55, 140). Adolescence has been defined as the time from puberty until full length and maturity are reached (40). The sample included 13-18-year-old-adolescents in this study. The development and maturation varies between ages during adolescence. Thirteen year old adolescents may be regarded as pre-adolescents (141) and 18-year-olds may be regarded as adults, as they have reached age of majority. Adolescence is a time that includes emotional and physical changes associated with maturation and marks a period of increased independent decision-making. These decisions may have an influence on the adolescents’ health-related behaviours (33). During adolescence, the years in the middle (15–16 years) might be the most vulnerable as they may be the years mostly marked

44
by new changes and independent decision-making. Therefore, the association between lack of economic resources and adolescents’ health-related behaviours might be particularly apparent during this age.

Suggestions from the Swedish commission for equality in health

Inequality in health has been recognised both internationally (29) and nationally (36). In 2005, WHO established the Commission on social determinants of health, (also called the Marmot commission), with the goal of working towards an equal health globally. This commission presented their results in 2008 (29). The Swedish commission for equality in health presented their suggestions in 2017 (36), which includes strategies that concern both macro and micro environments for shaping equality between groups in Sweden (36). The Swedish commission presents a number of areas to increase health and lower social inequalities in health among adolescents. Examples of these suggestions include changes in state benefits to low income families, building school playgrounds that stimulate physical activity and dialogue between adolescents, and increased tax on tobacco and alcohol as well as decreased tax on fruit and vegetables. Furthermore, the commission stresses the importance of the public school being a health-promoting environment for school children and adolescents, with a focus on fellowship and safety (36).
Methodological considerations

Quantitative studies
The studies in this thesis are mainly composed of cross-sectional studies. A limitation with cross-sectional studies is that cause and effect cannot be separated due to exposure and outcome being measured at the same time (142). Thus, longitudinal research will be needed to draw causal conclusions.

Validity
Validity refers to the instrument that is used in the study and how well the instrument measures what it is intended to measure. Fifteen questions were used from the ‘Life and Health-Young’ questionnaire in study I. This questionnaire has been distributed every second year ever since 1995 in several counties in Sweden, and the questions used in study I have been used in earlier published studies (104, 105, 114, 115); thus, these questions have been proven to be valid. The second questionnaire that was used in studies II and III included questions that had been used earlier, such as in the ‘Life and Health-Young’ questionnaire and two sub-scales from the EDI-C instrument (79). It also included newly developed questions. However, the two studies mainly used questions that had been used previously, which had been proven to be valid for adolescents, although it included a few of the newly developed questions. A pilot study was performed to test the validity of the questionnaire. One researcher visited one school class in grade nine (in a school that was not included in the study). While the adolescents answered the questionnaire, they were encouraged to ask questions of the researcher if they had any inquiries. A few questions were then reformulated, and a new pilot study was performed to ensure the validity of the edited questions.

Generalisability
Generalisability, or external validity, is about whether the results in a quantitative study can be applied to other groups apart from the study sample (143). All quantitative studies were performed in school. Therefore, adolescents that do not go to school were not included in these studies. In studies II and III, the sample was representative of the Swedish population when it comes to geographical spread and percentage of school adolescents in grade
9 that have passing graduating certificates (Table II). Compared to schools in general in Sweden, however, the sample was probably over-represented by pupils in schools having a health focus (health theme days or a specific health subject outside of the curriculum). There is however no official information regarding percentage of schools with a health focus in Sweden. A limitation in study I was that the sample was not representative of the Swedish population when it comes to number of adolescents living in urban and non-urban municipalities. It may, therefore, be difficult to generalise and claim that the results in study I represented all 15–16-year-olds in Sweden. However, the study had a large sample size of over 10,000 adolescents and included all upper primary schools and upper secondary schools in one county. Three quarters lived in urban municipalities in study I and one quarter in non-urban municipalities, whereas about half the population lives in the respective groups in Sweden (101).

In study I, parents’ education level was higher than the national average for parents of pupils in grade nine in Sweden (102). The population in urban areas, and people with a higher education level, on average, have higher socio-economic status. Higher socio-economic groups generally have more healthy health-related behaviours (29, 36). This implies that the study sample may have less unhealthy behaviours than that of a more representative sample. It is well known that socio-economic status is associated with health inequalities (144). On the other hand, in studies II and III, the parents’ education level was lower than the national average, implying that the study sample may have more unhealthy behaviours than that of the national average. Although foreign-born adolescents are included in all studies, a limitation was that this group was not analysed as a specific socio-demographic group in the same way as the adolescents, with regard to age, gender and socio-economic group in the quantitative studies. Foreign-born adolescents generally have slightly more unhealthy behaviours than adolescents born in Sweden (64).

Reliability

Reliability is another concept that can be used to judge the quality of a quantitative study (143). It refers to the preciseness of the instrument that has been used in giving the same answers to the questions on two different occasions (143). The ‘Life and Health-Young’ questionnaire has been used for a long time and has been proven to be reliable. The second questionnaire was tested to investigate whether the newly developed questions were reliable. A test-retest was performed for this questionnaire, and the internal consistency was found to be adequate.
Trustworthiness

Studies I, II and III in this thesis used self-reported data. This may have an effect on the trustworthiness of the results as adolescents have been found to sometimes under- or over-report health-related behaviours in questionnaires, as they find certain behaviours to be socially desirable or undesirable (145). The two questionnaires included many questions, which might have been a problem for pupils with short attention spans, which might have influenced the answers provided in the questionnaire.

Qualitative study

The fourth study was a qualitative study with focus groups discussions. One strength with using focus groups is that since participants are interacting with each other, it allows for more thoughts and ideas from the participants than in individual interviews (146). Memories and ideas get stimulated while listening to others in a focus group discussion. The way the dialogue is confined to the topics in the interview and what other participants in the group express is called “the group effect” (147). The interactions between the adolescents were good and friendly with some discussions being intense. In some cases, the discussion led to areas outside of the topic of the study. The moderator then led the participants back to the topics for the interview. Sometimes, some adolescents talked a lot more than others. To balance this, the moderator encouraged the more quiet participants to provide input.

The adolescents were informed about the confidentiality in the beginning of the interview and the moderator repeated this aspect during one of the interviews when one participant expressed anxiety regarding confidentiality. During another interview, one adolescent was rather uncomfortable in the situation at the beginning of the interview. The moderator then deviated from the interview guide and engaged in small-talk with the adolescents until the atmosphere was more relaxed. Five to eight participants are recommended for focus groups (146). Although two of the interviews consisted of four adolescents, the discussions proceeded smoothly.

The focus group interviews were performed in conference rooms where the adolescents went to school. School adolescents may try to give the “correct” answers that they think the moderator wants. This problem can arise during focus group interviews (147) and could be a problem when interviews are held at school, since adolescents are used to having interactions with teachers, where they are supposed to give correct answers. This might have had an impact on the focus group discussions. The reason for choosing to perform
the interviews at the participants’ schools was for the adolescents to be in a familiar setting where they would feel comfortable.

Credibility, dependability, conformability and transferability are all concepts that are used to analyse the trustworthiness of results in qualitative studies (123, 148).

Credibility
Credibility indicates how well the qualitative study results describe reality (123). To get more variation in the sample and interview responses, credibility was sought in a number of ways. A purposeful recruiting of schools was performed in both urban and rural areas with different socio-demographic structures. Furthermore, an inclusion of both girls and boys, and schools with both foreign-born adolescents and adolescents born in Sweden was sought. Moreover, credibility of the results relating to the research questions in the study was ensured by the interview guide, which was consistently used for all focus group discussions.

Dependability
Dependability refers to the extent to which the same findings would be found if the study was performed again (123). The moderator of the interviews transcribed all interview discussions, which ensured dependability. Furthermore, all authors took part in the analysis of the focus group interviews and discussions were held until consensus was reached. Including all authors in the analysis process also enhanced dependability.

Conformability
Conformability refers to the extent to which the study results are based on what was actually expressed in the interviews and not possible biases from the researchers (123). In the study IV manuscript, quotations from the interviews are given, which reinforce the study’s confirmability, in the sense that they enhance the possibility to evaluate how the adolescents expressed themselves during the focus group interviews.

Transferability
Transferability indicates the extent to which the results may be transferable to adolescents in other settings (123). Table II presents the education level of parents (which was lower than the national average), the percentage of pupils with passing graduating certificates in grade 9 (which was higher than the national average) and the percentage of schools located in rural versus
non-rural municipalities (the sample in study IV was composed of one urban municipality; four interviews took place at a rural village outside the city). This information is presented in order to facilitate transferability of the findings in the study.
Practical implications

Adolescence is a critical period in life when health-related behaviours are developed and set for adulthood. Parents can have great influence on adolescents’ health-related behaviours in several ways; for example, it may be important for parents to encourage their children to engage in healthy behaviours and for parents themselves to engage in their children’s health-related behaviours. Furthermore, it is vital for parents to have a close relationship with their children to build trust and to provide social support. Because of the importance of parents for adolescents’ health-related behaviours, it may be a good idea to involve parents in the school health efforts to influence parents to engage in their children’s health-related behaviours.

Most adolescents attend school every weekday, and school constitutes an important social environment for adolescents’ health-related behaviours. However, schools may be particularly crucial for vulnerable groups of adolescents, such as those who do not have a close relationship with or support from their parents, and for adolescents in low socio-economic groups as well as for girls, who seem to be more vulnerable when it comes to unhealthy behaviours. For health behaviour information from teachers to be effective, teachers may need to gain higher credibility and trust in adolescents. A suggestion is also that the school environment should infuse good social relationships between teachers and pupils and between adolescents, as fellowship seems to have great influence on adolescents’ health-related behaviours.

Although the social environments surrounding adolescents all seem to have an influence on their health-related behaviours, adolescents’ own personal ability to adopt healthy behaviours should be addressed. Adolescents should be empowered to take their own initiatives to adopt healthy behaviours by infusing them with courage, confidence and high self-esteem. To work with adolescents’ self-efficacy in relation to physical activity could be one way to encourage them to engage in physical activity even if they do not have someone to join them. This might be particularly important for girls since they seem to be more vulnerable when it comes to low level of physical activity. To increase well-being and healthy behaviours in adolescents, strategies are also needed to lower pressure from school and social media.
Although there is no longer a national organisation for health promoting schools in Sweden, the areas suggested for future implications would be suitable in HPS settings. Professionals in schools, such as teachers and school nurses, are also in a good position to address these areas.
Suggestions for further research

Longitudinal studies can draw causal conclusions regarding interrelated associations between psychosocial and socio-demographic factors for unhealthy behaviours in Swedish adolescents in different ages. The importance of these factors should be investigated in different social environments that surround adolescents.

Longitudinal studies are proposed to investigate the social relationship between pupils and teachers. These studies should be performed to determine if good social relationships with and high credibility and trust in teachers are associated with lower number of unhealthy behaviours in adolescents.

Swedish adolescents’ experience of pressure from school and social media should also be investigated longitudinally to evaluate whether their effects on adolescents’ well-being and health-related behaviours continue over time.

Adolescents at health-focused schools were studied in comparison to adolescents at non-health-focused schools. However, no longitudinal studies have evaluated the effects of annual health theme days in Swedish schools. Such studies are needed to evaluate their effect on adolescents’ health-related behaviours.
Conclusions

The thesis brings new knowledge to the field of psychosocial and socio-demographic factors related to unhealthy behaviours in adolescents in Sweden. Further, it explores adolescents’ thoughts and experiences regarding associations between social relationships and health-related behaviours.

New insights are presented on psychosocial and socio-demographic factors and health-related behaviours in adolescents living in Sweden. The findings indicate that nearly 60 per cent of Swedish school adolescents aged 15–16-years-old have two or more unhealthy behaviours. The results indicate that unhealthy behaviours in general are associated with interrelated psychosocial and socio-demographic factors. Poor social relationships and low well-being seem to be connected with unhealthy behaviours in general in adolescents. The findings highlight that associations of socio-economic status with unhealthy behaviours differ between the various age groups of adolescents in Sweden.

The results highlight that encouragement from parents are associated with a lower number of unhealthy behaviours in adolescents. Forty per cent of 15–16-year-old adolescents in Sweden seem to care about what their parents say regarding health-related behaviours. Approximately 20 per cent seem to care about health behaviour information from teachers. The results indicate that adolescents who care about what their parents say regarding health-related behaviours have less unhealthy behaviours.

School, family, friends and social media seem to be important social environments for adolescents, which influence their health-related behaviours and well-being. The results highlight that fellowship and close relationships with other people highly influence adolescents’ health-related behaviours. The findings also indicate that feeling pressure during adolescence is an important factor for low well-being and unhealthy behaviours.

The findings highlighted in this thesis may be useful in supporting adolescents in the family and at school to engage in healthy behaviours.
Sammanfattning (Summary in Swedish)

Ungdomsåren i en människas liv är viktiga då både bra och dåliga hälsorelaterade beteenden grundläggs då. Under denna tid introduceras ofta nya ohälsosamma beteenden, såsom rökning och alkoholkonsumtion. Fyra av de levnadsvanor som påverkar hälsan mest är rökning, alkoholkonsumtion, låg nivå av fysisk aktivitet och ohälsosamma matvanor.

Det övergripande syftet med denna avhandling var att undersöka samband mellan ungdomars hälsorelaterade beteenden (främst rökning, alkoholkonsumtion, fysisk aktivitet och matvanor) och psykosociala och sociodemografiska faktorer för att identifiera sårbarhetsfaktorer för ohälsosamma levnadsvanor samt att undersöka ungdomars egna erfarenheter och tankar kring detta.


medan upplevelsen av press hade samband med lågt välbefinnande och ohälsosamma levnadsvanor.

Resultaten i denna avhandling kan vara användbara både för föräldrar och inom skolan för att stödja ungdomar till en hälsosam livsstil. Dock behöver resultaten studeras longitudinellt för att se om de står sig över tid.
Acknowledgements – Tack!

Äntligen har jag rott mina forskarstudier i land! Det har varit en lång väg hit som doktorand på deltid och med två långa föräldraledigheter, men nu är jag i mål! Det finns många att tacka som har hjälpt mig på olika sätt under rens gång.

Först av allt vill jag ge ett varmt tack till min huvudhandledare Ragnar Westerling, först och främst för att jag fick chansen att påbörja forskarutbildningen inom det fält som jag tycker är så viktigt, nämligen barns och ungdomars hälsa, men också för det samarbete vi haft under dessa år och för den vetenskapliga kompetens som du har delat med dig av. Stort tack också till mina bihandledare, Birgitta Edlund och Christina Stenhammar, som varit ett stöd för mig under denna tid. Tack särskilt till Birgitta för vårt roliga arbete ihop med analysen av studie IV och för din kunskap inom kvalitativ metod och tack särskilt till Christina för ditt driv och snabba återkoppling!


References


102. The National Agency for Education's (Skolverket, SALSA) online information system on school results http://salsa.artisan.se/. Accessed: 6 March 2018


A doctoral dissertation from the Faculty of Medicine, Uppsala University, is usually a summary of a number of papers. A few copies of the complete dissertation are kept at major Swedish research libraries, while the summary alone is distributed internationally through the series Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine. (Prior to January, 2005, the series was published under the title “Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine”.)