Introduction of School-Based HPV Vaccination in Sweden

Knowledge and Attitudes among Youth, Parents, and Staff

MARIA GOTTVALL
The overall aim of this thesis is to provide a better understanding of knowledge, attitudes, consent, and decision-making regarding Human papillomavirus (HPV) vaccination, seen from the perspectives of concerned parties – high school students, school nurses, and parents.

Two quantitative studies were performed: one descriptive cross-sectional study and one quasi-experimental intervention study. Qualitative studies using focus group interviews and individual interviews were also performed.

High school students’ knowledge about HPV and HPV prevention was low but their attitudes toward HPV vaccination were positive. An educational intervention significantly increased the students’ knowledge regarding HPV and HPV prevention. Their already positive attitudes toward condom use and HPV vaccination remained unchanged. The students wanted to receive more information about HPV from school nurses. The school nurses were also positive to HPV vaccination but identified many challenges concerning e.g. priorities, obtaining informed consent, culture, and gender. They saw an ethical dilemma in conflicting values such as the child’s right to self-determination, the parents’ right to make autonomous choices on behalf of their children, and the nurse’s obligation to promote health. They were also unsure of how, what, and to whom information about HPV should be given. Parents, who had consented to vaccination of their young daughters, reasoned as follows: A vaccine recommended by the authorities is likely to be safe and effective, and the parents were willing to do what they could to decrease the risk of a serious disease for their daughter. Fear of unknown adverse events was outweighed by the benefits of vaccination. Parents also saw the school nurse as an important source of HPV information.

Conclusions: Positive attitudes toward HPV vaccination despite limited knowledge about HPV, are overarching themes in this thesis. School nurses have a crucial role to inform about HPV vaccination. It is important that the concerned parties are adequately informed about HPV and its preventive methods, so that they can make an informed decision about vaccination. A short school-based intervention can increase knowledge about HPV among students. From a public health perspective, high vaccination coverage is important as it can lead to a reduced number of HPV-related disease cases.

Keywords: Human papillomavirus, HPV, cervical cancer, vaccination, condom use, adolescents, school-nurses, parents, knowledge, attitudes, intervention

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To Vera and Ellen, 
for your great appetite for experiments and discovery
List of Papers

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


II Gottvall M, Tydén T, Höglund AT, Larsson M. Knowledge of human papillomavirus among high school students can be increased by an educational intervention. *Int J STD AIDS* 2010;21:558–562


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# Contents

Introduction ..................................................................................................... 9

Background ................................................................................................... 10
  Human papillomavirus (HPV) .................................................................. 10
  Prevention of HPV infection and cervical cancer ............................... 11
  Theoretical framework ......................................................................... 16

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

Methods and Materials .................................................................................. 22
  Overview of the studies ....................................................................... 22
  Study setting ......................................................................................... 22
  Population and sample ........................................................................ 23
  Procedure ............................................................................................. 25
  Data analysis ........................................................................................ 27
  Ethical considerations ......................................................................... 29

Results ........................................................................................................... 31
  Study I .................................................................................................. 31
  Study II ................................................................................................. 33
  Study III ................................................................................................. 34
  Study IV ................................................................................................. 37
  Study V ................................................................................................. 39

Discussion ..................................................................................................... 42
  Discussion of key findings ................................................................. 42
  Methodological considerations ......................................................... 45

Conclusions ................................................................................................... 48

Sammanfattning på svenska .......................................................................... 50
  Utgångspunkter ................................................................................... 50
  Sammanfattning av resultaten ......................................................... 51
  Slutsatser .............................................................................................. 52

References ..................................................................................................... 55
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG1</td>
<td>Control Group 1</td>
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<tr>
<td>CG2</td>
<td>Control Group 2</td>
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<tr>
<td>CI</td>
<td>Confidence Interval</td>
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<tr>
<td>FGI</td>
<td>Focus Group Interview</td>
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<tr>
<td>GAVI</td>
<td>Global Alliance for Vaccines and Immunization</td>
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<td>GSK</td>
<td>Glaxo Smith Kline</td>
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<td>HBM</td>
<td>Health Belief Model</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>HPV</td>
<td>Human Papilloma Virus</td>
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<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
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<tr>
<td>IG</td>
<td>Intervention Group</td>
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<tr>
<td>MSD</td>
<td>Merck Sharp &amp; Dohm Corp.</td>
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<tr>
<td>SRH</td>
<td>Sexual and Reproductive Health</td>
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<tr>
<td>STI</td>
<td>Sexually Transmitted Infection</td>
</tr>
<tr>
<td>VAS</td>
<td>Visual Analogue Scale</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Introduction

About 30 years ago, a German research group led by Harald zur Hausen discovered that Human Papillomaviruses (HPVs) cause cervical cancer.\textsuperscript{1,2} This made it possible to develop vaccines against the most common oncogenic HPV types. Two different HPV vaccines were registered in 2006 and 2007, both of which mainly target adolescent women. In 2008, Harald zur Hausen was awarded the Nobel Prize in Physiology or Medicine for his discovery of the link between HPV and cervical cancer. The same year, I started this PhD project. The vaccines were then offered to girls 13–17 years old at a subsidized price in Sweden. The picture has changed during my years as a PhD student. One of the vaccines is now offered free of charge to girls 10–12 years old through a school-based vaccination program where school nurses administer the vaccine. A catch-up vaccination program, through healthcare centers, is available for girls born 1993–1998. I do not believe it will end there. The school-based vaccination program was implemented about a year ago, and now discussions are frequently heard as to whether boys should also be included in the program.

Sexual risk taking among young people has increased in the last years, with an increased number of sexual relations, a higher prevalence of causal sexual intercourse without the use of condoms, and increased incidence of Chlamydia infections.\textsuperscript{3,4} Due to this fact, and the fact that HPV infection is the most common sexually transmitted infection (STI) in the world,\textsuperscript{5} it is of value to investigate adolescents’ knowledge about HPV and their attitudes to HPV preventive methods. To prevent the spread of HPV, it is important that adequate counseling about HPV and the preventive methods for these viral infections is available. To obtain a well functioning vaccination program, it is also of value to hear the voices of concerned parties such as parents and school nurses. The focus of this thesis has been to investigate these issues.
Background

Human papillomavirus (HPV)

Human papillomavirus (HPV) is a group of viruses containing over 150 different types, of which around 40 are transmitted sexually. Only 12 of these (HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59) are considered high-risk oncogenic types. HPV transmits via skin-to-skin contact and has been found to be a necessary, but not sufficient cause of cervical cancer. The most well known HPV types are HPV 16 and 18, which are associated with 70% of all cases of cervical cancer. Oncogenic HPV types are also associated with cancer in the anus, vulva, vagina, penis and oro-pharynx. Cancer in the cervix is the most common HPV-caused type of cancer. HPV type 6 and 11 are considered low-risk and cause genital warts, condyloma acuminata, and the rare disease recurrent respiratory papillomatosis.

Most sexually active individuals of both sexes will become infected with HPV during their life but most HPV infections are temporary and resolve spontaneously within a few years. However, some are persistent and may develop into precancerous lesions, which also might resolve spontaneously or with treatment, but they can also progress into cancer. According to the International Agency for Research on Cancer (IARC) approximately 5–15% of HPV-negative women are infected each year with any of the high-risk types of HPV, mainly HPV 16, but also 18, 31, 33 and 51. Sexually transmitted HPV infection is considered the most common STI in the world.

In general, the prevalence of HPV is highest in Africa and South and Central America, with a prevalence of 39% in Kenya and Honduras, lowest in Europe, and intermediate in Asia. The prevalence of genital high risk HPV among 15–23 year old women attending a youth health clinic in Stockholm, Sweden was 62%. The prevalence of oral HPV was almost 10% in one Swedish sample of young adults and less than 2% in another sample. A study of British men and women, 18–44 years old found a prevalence of high risk HPV in 16% of women and 10% of men.

The burden of HPV-related cancer

Globally, HPV infections cause approximately 610 000 annual cancer cases. This represents almost 5% of the global burden of cancer. Of these, almost 90%, or more than half a million cases, are cancer of the cervix.
cancer is the third most common cancer in women worldwide, with around 275,000 deaths every year.\textsuperscript{14} There is a strong relationship between cervical cancer incidence and a country’s level of development. More than 85\% of cases and deaths are estimated to occur in less developed countries of the world, where cancer screening often does not exist or is limited.\textsuperscript{15} In Sweden, about 450 women are diagnosed with cervical cancer and about 150 die from the disease every year.\textsuperscript{16} About a quarter of the persons diagnosed with cervical cancer in Sweden are younger than 40 years old, while the mean age is 54 years.\textsuperscript{17} 

Penile cancer is an uncommon cancer worldwide, accounting for less than 0.5\% of male cancers.\textsuperscript{7} Cancer in the anus, vulva, vagina, and oro-pharynx is also rare. However, studies show that the frequency of HPV-related anal cancer has increased in both women and men in the last 30 years.\textsuperscript{18,19}

Risk-factors for HPV and cervical cancer

HPV is strongly associated with sexual behavior in both men and women. The main risk factors for HPV infection are many life-time sex partners,\textsuperscript{12,20} a high number of new sex partners in the last year, sex without condoms, and partner concurrency – \textit{i.e.} dates of sex overlapped between two or more partners.\textsuperscript{12} Smoking as a risk factor for HPV infection is debated, but has been positively associated with persistent and high risk HPV infection in some studies.\textsuperscript{5,12,21,22} Studies of oral contraceptive use as a risk factor for HPV infection also show contradictory results.\textsuperscript{5} It is difficult to evaluate this relationship because of the strong association between the use of oral contraceptives and sexual activity.\textsuperscript{23} Young age, young age at first sexual intercourse, genetic and environmental susceptibility factors, and co-infection of other STI are also associated with HPV infection.\textsuperscript{5,12}

Prevention of HPV infection and cervical cancer

Primary prevention is defined as “the preemptive behavior that seeks to avert disease before it develops – for example, vaccinating children against diseases.” Secondary prevention is defined as “the early detection of disease or its precursors before symptoms.”\textsuperscript{24} 

Vaccination is a type of primary prevention. Two vaccines which target high-risk HPV are registered today, Gardasil (Sanofi Pasteur, MSD) and Cervarix (GSK). Both vaccines target high-risk types 16 and 18, which are associated with about 70\% of all cases of cervical cancer. Gardasil also targets low-risk types 6 and 11, which are associated with genital warts.\textsuperscript{25} Both vaccines have been proven safe and effective against the targeted types of HPV infection and lesions.\textsuperscript{26,27} No effect has yet been seen on cervical can-
cer incidence and it will likely take some time, as the incubation time for the disease is long.

The vaccine is administered by intramuscular injection and is given in a three-dose schedule over a period of six months. Both Gardasil and Cervarix work prophylactically and due to the high prevalence of HPV among sexually active persons, vaccination prior to sexual debut is recommended.\textsuperscript{28,29} Younger girls have been found to have a better immune response to vaccination\textsuperscript{28,30} and it has also been found that the vaccine is highly effective in girls before age 14.\textsuperscript{31} It is still unknown how long the vaccine protection lasts, and if a booster dose is needed. Over 89 million doses of Gardasil and over 30 million doses of Cervarix have been sold globally since the vaccines were approved.\textsuperscript{32} A majority of the adverse events reported after vaccine-approval were similar to those reported in the clinical trials of the vaccines. The risk of side effects of the vaccines is low, and mainly includes pain, swelling, and redness at injection site, headache, fever, and nausea.\textsuperscript{33} A large Swedish and Danish cohort study investigated serious adverse events of Gardasil and found no evidence supporting associations between exposure to the HPV vaccine and autoimmune, neurological, or venous thromboembolic adverse events.\textsuperscript{34}

In the Swedish vaccination program, children are offered vaccines to protect from nine diseases: Polio, diphtheria, tetanus, pertussis, infections caused by Haemophilus influenzae type b, measles, mumps, rubella, and pneumococcal infection. The vaccines are offered first through the Child Health Services and as the child grows older and starts school, through the School Health Services. A vaccine against HPV was introduced into the program in January 2010, and was to be given free of charge to girls 10–12 years old (born 1999 and later). The public procurement process of the vaccine was delayed due to appeals from a rival vaccine manufacturer. The procurement process was decided in December 2011, and the vaccine Gardasil was to be used in the vaccination program. Since the spring of 2012, the School Health Services administers the vaccination and schools offer the vaccination free of charge. A free catch-up vaccination is also available for girls born 1993–1998. For girls aged 13–17, HPV vaccine had been available at a subsidized cost between the years 2007–2011. The timeline in Figure 1 provides a graphical overview of the events, as well as when each of the studies in this thesis was made. In Sweden, the school-based program has reached an uptake of almost 80% for the first dose, while the catch-up program has a lower uptake of slightly below 60%.\textsuperscript{35}
In 2012, about 40 countries globally had introduced HPV into their national vaccination programs. Among the first countries to introduce it were Australia, the United Kingdom, the United States of America, and Canada. In Europe, it was part of the vaccination programs in three countries in 2007 but in 2012, 22 countries had introduced the vaccine into their programs. Young adolescent girls are the target group in all countries, but in Australia and in the USA, also young boys are recommended vaccination. Several other countries are considering recommendations for vaccination of boys. Catch-up recommendations differ between countries, as well as implementation strategies. Countries with school-based HPV vaccination, for example Australia, and the UK, generally have a higher uptake than other countries. The mentioned countries have an uptake of over 70%. 

At first, few middle- and low-income countries introduced HPV vaccine into their national vaccination programs due to the cost of HPV vaccines and vaccine delivery, and competing public health priorities. After recommendations from the World Health Organization (WHO), the Global Alliance for Vaccines and Immunization (GAVI), which funds vaccines for children in low-income countries, prioritized HPV vaccine in 2009. The GAVI has been able to buy HPV vaccines at a very low cost, and has started supporting HPV vaccination in several countries in 2013.

Condom use is another primary prevention method against HPV infection and thereby also against HPV related cancer. It has been discussed how ef-
fectively condoms protect against HPV infection and it is complicated to study. In 2006, however, an American study of female university students found that the risk of the women contracting an HPV infection decreased by 70% if the male partner regularly used a condom during the whole intercourse.\textsuperscript{39} However, HPV seems to transmit also by non-penetrative sex.\textsuperscript{40}

A secondary prevention method is cervical screening. The cervical screening program has, since its introduction in Sweden in the 1960’s, decreased cervical cancer incidence and mortality rates radically.\textsuperscript{16} Cervical cancer was the third most common cancer type among Swedish women when the screening program was introduced. Today, mortality rates have decreased and cervical cancer is no longer among the ten most common cancer types among Swedish women. The program invites women aged 23–50 years to take a cytological smear test every third year. The test can detect precancerous lesions of the cervix before they develop into cancer. Between ages 50 and 60–65, women with normal test results are called every fifth year and at 60–65 they can discontinue with the screening. Older women who have had non-normal test results are tested more often and are followed for a longer period of time. About 80% of Swedish women between 23–60 years regularly participate in the cervical screening program.\textsuperscript{41,42} Swedish-born women attend the screening at a greater extent than do immigrant women, and non-adherence to the program increases the risk of cervical cancer among both Swedish-born and immigrant women.\textsuperscript{43} Since the HPV vaccines do not target all HPV-types that are associated with cervical cancer, there is a risk of becoming infected even if one is vaccinated. Therefore, the cervical screening will continue to be important in spite of the HPV vaccination program.\textsuperscript{44}

**Health Promotion**

Sexual education has a long tradition in Sweden and in 1955 Sweden became the first country in the world to introduce mandatory Sexual and Reproductive Health (SRH) education in compulsory school. Nowadays, SRH education is not a school subject but schools are required to provide such education through integrating it in other school subjects. Studies have shown that the quality of SRH education varies widely and needs to be improved in many schools.\textsuperscript{45,46} Many students report that HPV and condyloma are not addressed in the education.\textsuperscript{46}

Health education has become more and more accepted as a way to work for better public health and improve the success of public health and medical interventions. The interest in preventing illness and ill-health through lifestyle changes has also increased radically.\textsuperscript{47} A great number of different approaches, methods, and strategies for health interventions have evolved from social and health sciences. Health education is often dependent on theoretical perspectives, research, and practice tools of various disciplines such as psy-
chology, sociology, anthropology, communications, nursing, and marketing. Medicine, epidemiology, and statistics are also essential in health education.47

Today, the Internet and computer use is common worldwide, and the Internet is often used in health promotion. Internet-based health interventions have shown positive effect on diet and activity outcomes,48 but the Internet has also been used for preventing STIs in general49 and more specifically HIV50. An online STI-risk communication intervention was found efficacious in influencing perceived susceptibility to STI and STI-testing intentions immediately after the intervention, and in reducing rates of unprotected sex at three months follow-up.49 It has also been suggested that web-based interventions for adolescents need to be more intensive than one single session, since this had only a minor effect on norms regarding condom use.50 It has also been argued that health education should be tailored specifically for subgroups for optimal effect.51

The attitude to HPV vaccination is generally positive among young people and their parents, in Sweden as well as in other parts of the world.52-55 Despite a positive attitude, knowledge about HPV and HPV vaccination is rather limited in most populations and more information about HPV and HPV prevention is needed.52,54,56 To prevent the spread of HPV, it is important that youths and their parents receive adequate information and counseling about HPV and the primary and secondary preventive methods for this viral infection.

Sexual behavior and contraceptive use among Swedish adolescents

The mean age for first sexual intercourse in Sweden is 16–17 and has been relatively stable since the 60’s.57,58 About two thirds of adolescents use some sort of contraception, most commonly a condom during their sexual debut58-60 and about 50% report that they were in love with their first sex partner.58 An increase in the mean number of lifetime sex partners has occurred during the last 40 years, from 1.4 to 4.7 in women and from 4.6 to 7.1 in men. The number of adolescents reporting more than two sexual partners during the last year has also increased, especially among young women.57

Casual sex (sex on the first date, one-night stands) is becoming more and more common and over 20% of adolescents aged 16–17 years report experience of this.61 Casual sex is widely accepted among Swedish adolescents and casual sex without the use of condoms has also become more accepted over time.4 This witnesses a more liberal attitude towards sexuality and sexual relations and a drift away from the “ideology of love,” i.e. the concept that sex should only occur between persons who are in love.4
In several Swedish studies, adolescents as well as adults report experience of oral sex.\textsuperscript{57-59} Between 59 and 70% of students in the last year of high school have experienced oral sex in some form and among female university students almost 100% had experience of oral sex.\textsuperscript{60,63} This should be taken into consideration when planning preventive information strategies. It should be brought to light that oral sex carries a risk for STI transmission, including HPV, which could cause oral cancer. The risk is small, but information on the actual rates of STIs, including HPV and HIV transmission through oral sex is limited.\textsuperscript{64,65}

Swedish adolescents seem to protect themselves more frequently against unwanted pregnancy than against STIs.\textsuperscript{60} The most common contraceptives used by adolescents are condoms and contraceptive pills. Condoms are common at first intercourse but along with increased sexual experience, other contraceptive methods become more common.\textsuperscript{63,66,67} Swedish adolescents have access to subsidized pills and condoms and can receive emergency contraceptive pills and condoms free of charge at youth clinics. Emergency contraceptive pills are available without a prescription in pharmacies. Studies have found that contraception use among high school drop-outs is considerably lower than among high school students\textsuperscript{60} and the use of contraception is mainly seen as the woman’s responsibility.\textsuperscript{68,69}

Theoretical framework

Health Belief model

The Health Belief Model HBM (Figure 2) is a model of individual health behavior that is frequently used in health promotion. The HBM has been used both as guidance for health behavior interventions and to explain health-related behavior change. According to the HBM, people will take action to prevent ill-health conditions if they consider themselves to be susceptible to the condition (perceived susceptibility to a health threat), if they believe the condition would have potentially serious consequences (perceived severity), if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to or the severity of the condition, and if they believe that the anticipated barriers to, or cost of, taking the action are outweighed by its benefits (perception of the benefits, costs, and barriers of an action).\textsuperscript{47} The concept of self-efficacy, \textit{i.e.} the conviction that one can successfully execute the required behavior, developed by Bandura, is sometimes included in later versions of the HBM.\textsuperscript{70} The HBM was used as a guide in the development of the questionnaires in studies I and II, and questions regarding perceived susceptibility and severity of the disease were included. The intervention addressed information about HPV and condoms, \textit{e.g.} how common HPV is, how it is transmitted, and
how to use condoms correctly. The intervention also tried to increase the students’ self-efficacy to use condoms through a game called “condom relay-race,” where the students were to open a condom package and practicing rolling it out, as well as through discussion exercises about attitudes to condom- and contraceptive use, and how to communicate safer sex.

Figure 2. The Health Belief Model

Ethics

*Ethics* deals with questions such as “What should we do?” and “How should we lead our lives?” The words *ethics*, from the Greek word *ethos*, and *morality*, from the latin word *mos/mores*, are often used synonymously and have about the same meaning, namely, manners or customs. However, within the English language, as well as in Swedish, a shift in meaning has developed where *morality* refers to current opinions of good and bad, or right and wrong in a certain context, while *ethics* refers to the philosophical and theoretical reasoning over morality. 71

Ethics is not only about making the right decision in a given dilemma but also about justifying the decisions and choices made. Ethical dilemmas arise from conflicting values, norms, and interests. In an ethical dilemma there may be good reasons for more than one course of action and no definite solution exists. Since a choice has to be made, the loss of at least one value or interest is unavoidable in an intrinsic dilemma.
A guide to balance values in this type of conflicts are the four well known principles: respect for autonomy, nonmaleficence, beneficence, and justice, originally presented by Beauchamp and Childress. 

Respect for autonomy deals with acknowledging peoples’ right to hold views, to make choices, and to act according to their personal values and beliefs. Autonomy can not only be seen as a right but also as a competency. It can also be part of a view of the human nature, i.e. as human beings we have the capacity to, and often want to, govern our own lives. According to this view, the individual is seen as separate from others and in possession of free choice, without undue pressure from other people. One way to achieve autonomous decisions in medical practice is the procedure of obtaining informed consent from either the patient or the guardian of the patient. According to Swedish law (1983:47), a child younger than 18 years old needs the consent of a parent or guardian for medical interventions. However, the law also states that as the child grows older and becomes more mature, her or his wishes should be taken more into consideration. Regarding HPV-vaccination, it can be problematic to override a parent’s wish, and also difficult to assess a child’s competency to make an autonomous decision. It has been pointed out that the HPV vaccine creates ethical challenges for school nurses and midwives, among others, related to providing information about the vaccine to young girls, as the vaccine should be given before the sexual debut. In this context, questions such as “How do you inform 12 year-old girls about the vaccine?” and “How should the parents be informed?” could be discussed.

Donchin has developed an alternative model in which the relational aspects of autonomy are highlighted. A relational approach requires shared activity based on the integrated lives of the care provider and the patient. According to theories on relational autonomy, individuals might have interests related to other persons that are close to them and they might not necessarily regard this as a restriction of their autonomy. Rather, they might see it more as a voluntary involvement of the close ones in their lives.

The principles of nonmaleficence and beneficence impose obligations not to inflict harm on others, and to contribute to others’ welfare. Utility requires that people balance benefits, risks, and costs to generate the best overall outcome. In the case of HPV vaccination, administering three injections may cause harm to the vaccinated individual, even more so to a person who already fears injections. Vaccination also exposes the person to a risk of side effects. Being protected against a severe disease, however, most typically outweighs the risks. Another risk–utility consideration is related to the fact that youths’ sexual behavior involves increased risk taking with reduced condom use. There is a risk that a vaccine against a sexually transmitted disease can give young women and men a sense of false security and lead to an increase in sexual risk taking, which in the long term can increase the spread of other STIs.
There might also be conflicts between beneficence and respect for autonomy when parents decline vaccination for their young child. From a public health perspective, vaccination of a large portion of the population can lead to herd protection and sometimes also to a disease being extinguished. Vaccination could therefore be seen as both a private, or individual, good, and a public, or collective, good. A private good is a good that benefits only the vaccinated individual, while a public good benefits the entire population.79

*Justice* can be understood both as a principle for distribution and as an expression of equality. A just distribution can be based on needs, merits or be according to effort or contribution. Equality refers to the moral presumption that all humans should be treated equally, based on their human dignity.72 In this latter form, justice is relevant for discussion of HPV vaccination, in that all youths should receive the vaccine, regardless of culture, socio-economic status, parents’ knowledge, and sex. When the vaccines first came to Sweden and were offered to young girls at a cost, girls with university-educated parents were much more likely to be vaccinated than others.31 The picture might have changed now that the vaccine is offered free of charge in Sweden. However, it is still only offered to young girls even though boys also can develop cancer caused by HPV. What information should be given to boys of the same age? Should boys and their parents not be informed about vaccines against HPV even though they also risk suffering from disease caused by HPV? Another issue regarding justice is that low-income countries bear the greatest burden and deaths of HPV-related cancer, but it is unclear whether these countries can afford the vaccine.14,15 However, this discussion is outside the scope of this project.

Ethics has been an overall theme for this thesis, as the ethical questions about this vaccination are numerous. The ethical discussion has been deepened in study III and IV and in those studies the interview guide and the interpretation of the results have also been influenced by ethical theory.

**Gender theories**

*Gender* can be defined as male or female characteristics that are culturally constructed within a society. In other words, gender refers to the social construction of femininity and masculinity. *Sex* on the other hand, refers to the classification of people as male or female according to their chromosomal typing, biological differences, or reproductive function.80 Yet, most gender research today states that *sex* and *gender* must be seen as related and that gender cannot be seen as completely separated from sex.81 An essential aspect within gender theories concerns the power relations between men and women in a society, and how hierarchical power relations are constructed and constantly reproduced within the current gender system. “Doing gender,” *i.e.*, the belief that gender is seen as constantly built up and not as naturally given, is another essential aspect of gender theories.82
Regarding the construction of femininity, the performing of care has been identified as a central characteristic of the constitution of womanhood. A sign of this is the idea of nursing as a female task, but it can also be seen in the distribution of work within the family. In Sweden, despite a long time of equality work, it is still mainly women who take care of the caring responsibilities in the family, and thus, it could be argued that caring tasks are still essential to the social construction of women’s gender identity. Moreover, women are also often seen as being responsible for sexual and reproductive health. Gender has also been related to the distinction between public and private, in that femininity has been linked to the private sphere and masculinity to the public sphere.

Regarding the construction of masculinity, the hegemonic masculinity is the most valued form of masculinity. This form of masculinity is characterized by being constructed as superior to femininity. Hegemonic masculinity differs from other, inferior masculinities. Its characteristics include aspects such as aggressiveness, strength, drive, ambition, self-reliance, and risk-taking. Most of all, hegemonic masculinity can be understood as the pattern of practice that allows men’s dominance over women. Hegemonic masculinity may not be the most common form of masculinity, but it is the “ideal” form to which men are “supposed” to aspire.

The new vaccine against HPV has evident gender aspects. Targeting a vaccine predominantly at girls and young women may consolidate the understanding that women are responsible for sexuality and reproduction and therefore even for preventative measures. A study in the USA showed that pediatricians were more inclined to recommend the vaccine to girls than to boys. There is a risk that vaccination against HPV for women contributes to confirm the perception that men are less responsible for reproductive health, which dates back from the 70’s when female contraceptive methods became available.

Gender theories have been present in the planning of the studies in this thesis but deepened in study III and IV, where also the interview guide and discussion was influenced by gender theory.
Aims

Overall aim
The overall aim of this thesis is to provide a better understanding of knowledge, attitudes, consent, and decision-making regarding HPV vaccination, seen from the perspectives of concerned parties; high school students, school nurses, and parents.

Specific aims
1. To investigate the knowledge of HPV, and the attitudes towards HPV vaccination and condom use among first year high school students.
2. To evaluate the effect of an educational intervention about HPV and preventive methods for cervical cancer, such as vaccination, condom use, and Pap smear testing, directed at first year high school students.
3. To explore and describe school nurses’ perceptions of HPV vaccination and their task to administer the vaccination in a planned school-based program.
4. To explore the relational aspects of the consent process for HPV vaccination as experienced by school nurses.
5. To explore how parents reason when they accept HPV vaccination for their young daughters as well as their views on HPV-related information.
Methods and Materials

Overview of the studies

This thesis contains studies of both quantitative and qualitative nature. A number of different study designs and data collection methods have been used. An overview of these is presented in Table 1.

Table 1. Design, methods, and participants of the studies included in the thesis.

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<thead>
<tr>
<th>Study Design</th>
<th>Data collection method</th>
<th>Participants</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Cross-sectional</td>
<td>Classroom questionnaire</td>
<td>608 high school students</td>
<td>Chi², Fischer’s exact test, t-test, regression analysis</td>
</tr>
<tr>
<td>II. Quasi-experimental</td>
<td>Classroom questionnaire</td>
<td>276 high school students (at follow-up)</td>
<td>Mixed-effect models, Spearman’s rank-order correlation</td>
</tr>
<tr>
<td>intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Qualitative,</td>
<td>Focus group interviews</td>
<td>30 school nurses (4–8 school nurses in each group)</td>
<td>Qualitative content analysis</td>
</tr>
<tr>
<td>explorative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV. Qualitative,</td>
<td>Focus group interviews</td>
<td>30 school nurses (4–8 school nurses in each group)</td>
<td>Qualitative content analysis</td>
</tr>
<tr>
<td>explorative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V. Qualitative,</td>
<td>Individual interviews</td>
<td>27 parents of 11–12 year old girls</td>
<td>Qualitative content analysis</td>
</tr>
<tr>
<td>explorative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Study setting

Study I and II were performed in public and private high schools in the county of Uppsala, Sweden. The schools were situated in the medium-sized academic city of Uppsala, the smaller town of Enköping, and the village of Gimo.

Study III and IV were performed in five Swedish municipalities: Uppsala, Gävle, Örebro, Västerås, and Tierp. Together, these five represented large, small, urban and rural municipalities. Participants for study V were recruited
from Uppsala, Stockholm, and Gävle – three municipalities of different sizes and characteristics.

Population and sample

Study I
The study was conducted in the fall of 2008. At that time, the total population of first year high school students in the county was about 5600. A strategic sample of 24 classes from seven different high schools was selected. The schools included both public and private schools and the classes consisted of both vocational and theoretical educational programs. The sample size of 709 students represented 13% of the population. A total of 347 girls and 261 boys responded – corresponding to a response rate of 84%. The mean age of the respondents was 16 years. A majority ($n = 569$) of the respondents were born in Sweden and 24% ($n = 143$) had immigrant backgrounds (one or two immigrant parents).

Study II
A strategic sample of four classes from three high schools was assigned to the intervention group, and nine classes from three other high schools were assigned to two comparison groups. The intervention group (IG) and comparison group 1 (CG1) comprised of classes from study I, and the data from these classes from study I were used as baseline measure. Comparison group 2 (CG2) had no prior knowledge of the study before they completed the follow-up questionnaire in study II. The number of students in each group is presented in Figure 3.
Study III & IV

Seventy school nurses working in compulsory schools were asked to participate in a focus group interview (FGI). Thirty-four of them volunteered to participate. Five FGIs were later conducted with a total of 30 school nurses. Four school nurses did not show up to the scheduled FGI because of lack of time or reporting sick. A majority of the nurses who declined participation mentioned lack of time as the reason. One FGI per municipality was conducted.

Study V

School nurses helped with the recruitment of parents by distributing an information leaflet about the study to all parents of 11–12 year old girls \( N = 1888 \) in their schools. The parents were recruited from three strategically chosen municipalities where the school-based HPV vaccination program was just about to start. Many other municipalities started vaccinating against HPV one semester later. A total of 29 parents who had agreed to vaccinate their daughter volunteered to participate. Twenty-seven parents (23 women, 4 men) of 11–12 year old girls were interviewed. Two of the parents were not interviewed due to practical issues.
Procedure

Study I

Principals at seven different high schools were contacted in order to obtain permission to conduct the study in their schools. They were asked to select 2–4 classes, depending on the size of the school, with a fairly equal number of boys and girls from both theoretical and vocational high school programs. After the homeroom teacher had given their permission to conduct the study in their class, the students received both written and verbal information about the study and that it was voluntary and anonymous. The students who decided to participate received a self-administered questionnaire in the classroom, distributed by research assistants or by the researcher. Only 3 boys (0.4%) present in the classroom chose not to participate. Consequently, the external dropout rate (15.9%) consisted mainly of students who were not present at school on the day of data collection.

The questionnaire consisted of two parts, where the first included questions regarding socio-demographic and reproductive characteristics, behavior, and knowledge. When it was completed, the students put it in an unmarked envelope on their desk, and the second part was then distributed. The second part began with a short introduction about HPV, HPV-related cancers, and HPV vaccination and its cost. This introduction aimed at helping the students decide what their attitudes toward vaccination would be, despite their previous knowledge. The students were not permitted to look at or change the answers in the first part after they had received the second part. Following completion, the second part was also put in the envelope.

Study II

Principals at the seven high schools from study I were contacted in order to obtain permission to conduct a follow-up study in their school. They received written information about the aim of the study, and explaining that with their permission, 1–3 classes in their school would be assigned to either an intervention group (IG) or a comparison group (CG1). The IG would receive an educational intervention about HPV and condom use and also be asked to complete a questionnaire. CG1 would only be asked to complete a questionnaire. Principals of five of the schools accepted participation. The classes were divided into the IG and the CG1 in a way to make them as similar as possible regarding gender distribution, study program, and HPV knowledge. An additional comparison group (CG2) from a school that had not previously been in contact with the study completed the follow-up questionnaire, to investigate if time, or filling in the baseline questionnaire, influenced or biased the results. The follow-up questionnaire was a shorter version of the baseline questionnaire from study I.
In March 2008, the researcher and an assistant visited the classes in the IG to hold a lesson about HPV and preventive methods, hand out a specially designed folder about HPV and preventive methods, with an attached condom, and give information about a specially designed website containing information about HPV and other STIs, and an STI-quiz. The lesson consisted of an introduction about HPV, e.g. how common it is, what it causes and how to prevent it. After that, the students were informed about condom-use, and played a game called condom relay-race. Following, a discussion exercise about attitudes to condom- and contraceptive use was performed. In the beginning of the lesson, the students were once again informed about the study verbally and in writing, that it was voluntary and anonymous, and that they would be asked to complete a questionnaire ten weeks after the lesson.

Study III & IV
Coordinating school nurses from five mid-Swedish municipalities contacted school nurses in compulsory school in their municipality, distributed written information about the study, and asked if they were interested in participating in an FGI about HPV vaccination. School nurses who agreed to participate were asked to fill in a background questionnaire before the interview started. They also received written and verbal information about the study from the researchers, and it was made clear that all opinions were to be respected.

A female moderator led the FGI and an observer took notes and summarized the discussion in the end. The FGI lasted one to one and a half hours and in the end each participant received a movie ticket. Each FGI was recorded with the permission of the school nurses and was transcribed verbatim by the researcher within a week after the FGI had been held.

Interview guide
A semi-structured interview guide was used and it included the topics Views on HPV vaccination, Views regarding information on HPV and HPV vaccination, Boys’ role, Consent, Culture, and school nurses’ own knowledge. It had been tested in a pilot FGI and worked well – therefore, no changes were made.

Study V
School nurses (n = 100) in Uppsala, Gävle and Stockholm assisted with recruitment of participants for the study. They distributed an invitation letter about the study to parents of all girls, 11–12 years old (N = 1888), who had been offered HPV vaccination during the current semester. Parents interested in participating were asked to contact the researchers for more information about the study and to make an appointment for the interview. The inter-
views were performed at a place chosen by the parent; most often at the parent’s or the researcher’s place of work, or in the parent’s home. Before the interview started, the researcher informed about the study and that participation was voluntary, and the parent signed a consent form and filled in a short background questionnaire. At the end of the interview, the interviewer summarized what had been said during the interview and the parent were asked to correct if anything in the summary was misinterpreted or if anything of significant meaning had been left out. The parent was also invited to ask questions and was given a movie ticket for her or his participation. The interviews were recorded and transcribed verbatim as soon as possible after the interview. The researchers listened to the recorded interviews and read the transcripts simultaneously, to make sure that the interviews were transcribed correctly.

**Interview guide**

Two main open-ended questions made up the semi-structured interview guide: *How did you (and your partner) reason before making a decision about the HPV vaccination for your daughter?* and *What did you think about the information you received from school?* When the researcher found it necessary, she asked for clarifications and follow-up questions. Three pilot interviews were made before the study, but did not indicate any need for changes in the interview guide.

**Data analysis**

**Quantitative data (Study I & II)**

Descriptive statistics, including frequencies, proportions and means were used to describe characteristics, knowledge and attitudes in the first two studies. In study I, the $\chi^2$ test was used to test for differences in knowledge and attitudes between groups. In the same study, t-tests were used to compare means and 95% confidence intervals (CI) were determined for the Visual Analogue Scales (VAS). A logistic regression analysis was performed to investigate which factors were associated with intention to be vaccinated.

In study II, the answers to the questions regarding specific HPV knowledge were divided into two categories: correct answer (score = 1) and wrong answer/don’t know (score = 0). The scores were then added to form an index of knowledge. A maximum score of 10 could be achieved if all questions were answered correctly. Differences between the groups were tested at baseline and at follow-up. Mixed-effects models with a random intercept term for each cluster (class) and group as a fixed effect were estimated for each question. Intention to attend cervical screening if vaccinated
was analysed by a linear mixed-effect model. A logistic mixed-effect model analyzed binary outcome variables. The overall knowledge index and answers to questions related to the influence of HPV vaccination on condom use was noticeably non-normally distributed and therefore dichotomized and analyzed as binary variables. The knowledge index was categorized as ‘Five or more correct answers’ or “Less than five correct answers” and VAS as “Highly likely” (90–100 mm) or “Not highly likely” (0–89 mm). Correlation between ordinal-scaled variables was tested with Spearman’s rank-order correlation. Differences were considered significant if \( p < 0.05 \). The percentages were calculated on the students answering each question and the internal dropout varied between 0–5%.

Qualitative data (Study III, IV, V)

The qualitative studies of this thesis (study III, IV, V) were all analyzed with an inductive approach of qualitative content analysis. This approach involves analyzing data with “little or no predetermined theory” and is appropriate in areas where only a little (or no) research has been made. 90

In the analysis of study III and IV a paper by Graneheim and Lundman was used as a guide. 91 It provides “an overview of important concepts related to qualitative content analysis, illustrates the use of concepts related to the research procedure, and proposes measures to achieve trustworthiness throughout the steps of the research procedure.” It could be seen as a recipe, describing in detail how to perform qualitative content analysis in a way to enhance trustworthiness. The transcripts were first read through several times to give an overall sense of the content. Meaning units were then located, condensed (i.e., shortened while preserving core content), and then labeled with a code describing the content. The codes were then sorted into categories and subcategories. In study III an overall theme was also identified.

Study V was also analyzed with qualitative content analysis. In this study, a paper by Burnard was used as a guide. 90 It differs from Graneheim and Lundmans’ paper91 in that that the analyzing process does not contain the step of condensation. Otherwise it is fairly similar: Notes of what was said in the interviews were made in the margin of the transcripts and these were used as the initial codes. The codes from all interviews were collected and reviewed, duplicates were removed, and similar codes were grouped together into categories and themes. The transcripts were then read again, and data that fit under a certain category were labeled accordingly. Two researchers made the initial analysis of the data, and to avoid “lone-researcher bias” other researchers in the research group analyzed the data independently.

The content and composition of the subcategories (study III & IV), categories (study III, IV & V), and themes (study III & V) were discussed in the
Ethical considerations

Study I, II and V were approved by the Regional ethical review board in Uppsala, Sweden (dnr 2008/335 and 2012/48). For study III and IV, an application to the board was sent, but according to Swedish regulations, permission for the study was not needed from the board. The studies followed Swedish law on ethical regulations \(^93\) and fulfilled the ethical requirements defined in the World Medical Association’s Declaration of Helsinki. \(^94\) The participants were informed verbally and in writing about the aim of the study, that participation was voluntary, and that they at any time could discontinue participation. Their name or personal identification number was not registered, and no individual can be identified in the presentation of the data.

One specific ethical consideration for study I and II was the young age of the participants, but according to Swedish law, children over 15 years old are allowed to consent to participation in a study without asking for parents’ permission. \(^93,95\) There is a risk that some participants found certain questions too personal and therefore chose not to answer them, or chose to decline participation in the study, which they could do without giving a reason. If questions or concerns arose from participation in the study, they were welcome to contact someone in the research group, who was prepared to answer questions or refer the participant to the school nurse, a counselor or a youth clinic.

An ethical consideration for study III and IV was the possible risk that the school nurses had limited knowledge about HPV vaccination since they had not yet started vaccinating, and thus felt uncomfortable discussing their views of the vaccination. A possible benefit from participating in the study would be that the FGI led to increased reflection among the nurses about the subject. This might have led to increased information seeking about HPV and HPV vaccination, to be better prepared to inform and to answer questions from students and parents. This could be a benefit for school nurses, parents, and students.

Concerning study V, discussing questions about an STI and its prevention through HPV vaccination may feel uncomfortable for parents of young girls. We assumed that parents who felt strongly in this way declined participation or discontinued participation, which they were able to do without giving a reason. The interviewed parents could speak freely about the topics in the interview guide and avoid mentioning what felt uncomfortable or too personal to talk about. If the parents had questions or were in need of any form of assistance, the researchers tried to answer questions themselves or to pass on to a counselor, or a school nurse.
Filling in a questionnaire, participating in an FGI, or participating in an individual interview of this kind might make people feel uncomfortable, but we estimated that this risk was small and underlined that participation was voluntary. The benefit is that it can give the participants new knowledge about HPV and HPV vaccine, and also to evoke an interest in learning more about the subject. Participating in an FGI or in an individual interview could give the informant an opportunity to reflect about HPV and HPV prevention, and to express her or his thoughts and points of view. Increased knowledge might lead to increased participation in cervical screening and HPV vaccination, or at least a more informed consent or dissent to prevention.
Results

Study I
Main findings
Few students had heard about HPV and even fewer had heard about a vaccine against HPV. They had a positive attitude towards vaccination but many did not intend to be vaccinated because of obstacles such as the high cost of vaccination. Most of the students wanted more information before considering being vaccinated against HPV. The intention to use a condom with a new partner decreased if the students themselves were to be vaccinated.

Characteristics
The mean age of the students was 16 years and 69% (n = 417) were enrolled in a theoretical study program and 31% (n = 191) were enrolled in a vocational study program. About 40% (n = 239) had had their sexual debut, and of these 65% (n = 155) had used a condom at their first intercourse. Five percent (n = 11) of the students who had debuted sexually stated that they had contracted an STI, most commonly (n = 6) a Chlamydia infection. A majority of the students (65%, n = 393) did not know if they were vaccinated against HPV or not. Five percent (n = 17) of the girls stated that they were vaccinated against HPV.

Knowledge
Just over 13% (n = 82) of the students had heard about HPV and 6% (n = 35) were aware of a vaccine against HPV. Specific questions regarding the accuracy of statements concerning HPV, i.e. “HPV is spread through sexual contact” and “HPV can cause cervical cancer in women,” were answered with “don’t know” by over 88% (n = 534) of the students. However, more girls than boys gave a correct answer to if women can contract HPV (p < 0.001) and if HPV can cause cervical cancer in women (p < 0.001). The students who had heard about HPV claimed that they had received their information mainly from the media (43%, n = 35) or from school (34%, n = 28). Some students had received information from other sources.
Eight percent \((n = 28)\) of the girls had discussed HPV-related issues with their parents and 15 of these girls were vaccinated against HPV. Only one boy had discussed HPV with his parents \((p < 0.001)\). Girls generally had better knowledge of HPV than boys, and students attending theoretical educational programs generally had better knowledge of HPV than students attending vocational educational programs.

**Attitudes**

Most of the students \((84\%, n = 508)\) would like to be vaccinated against HPV but only 12\% of those \((n = 62)\) intended to take the necessary steps to do so. More girls \((91\%, n = 314)\) than boys \((74\%, n = 194)\) wanted to be vaccinated \((p < 0.001)\). More girls than boys also intended to take the necessary steps to vaccination \((p < 0.001)\). The students observed different obstacles for vaccination. The high cost of vaccination was the biggest obstacle for both girls and boys \((37\%, n = 227)\). Other obstacles were low perceived risk of infection and fear of needles. The distribution of answers regarding obstacles to HPV vaccination is presented in Figure 4.

![Figure 4](image)

*Figure 4.* Obstacles for HPV vaccination identified by the students participating in study I.

Seventy-three percent \((n = 443)\) of the students wanted more information about HPV before considering vaccination. More than 35\% \((n = 220)\) stated that they would like to receive such information from the school nurse and more than 30\%, \((n = 186)\) stated that they would like to receive information from a Youth clinic, mainly girls \((p < 0.001)\). More boys \((40\%, n = 105)\) than girls \((27\%, n = 92)\) found it embarrassing to discuss HPV vaccination.
with their parents ($p < 0.001$). Over 80% ($n = 512$) of the students stated that they would be more inclined to become vaccinated if they knew that the vaccine also protected against genital warts. The intention to use a condom with a new partner decreased if the students themselves were to be vaccinated ($p < 0.001$), and they believed that it would be the same for other adolescents ($p < 0.001$).

**Study II**

**Main findings**

At baseline the students’ knowledge about HPV was very low in both the IG and the CG ($p = 0.620$). However, at follow-up, the knowledge had increased in the intervention group and was significantly higher than in the comparison group ($p < 0.001$). The attitudes toward condom use were equally positive in both groups before and after the intervention. The attitudes to vaccination against HPV and to cervical screening also remained the same ($p < 0.05$). No differences between CG1 and CG2 were found regarding specific knowledge of HPV or attitudes to preventive methods.

**Effect of the intervention**

In an open-ended question about which STIs the students were aware of, only one student at baseline mentioned HPV. At follow-up, 70% ($n = 61$) in the IG and 7% ($n = 7$) in CG1 included HPV in their answers ($p < 0.001$). At baseline, one student believed HPV to be the most common STI in Sweden, while at follow-up, 30% ($n = 25$) of the IG and 1% ($n = 1$) of the CG1 believed so. At baseline, there was no difference between the groups, with regard to knowledge about HPV. At follow-up, all students in the IG ($n = 92$) had heard about HPV and 35% ($n = 38$) in CG1 had heard about the virus ($p < 0.001$). The awareness of a vaccine against HPV was also higher in the IG (64%, $n = 59$) than in CG1 (26%, $n = 28$, $p = 0.032$). At follow-up, over 80% ($n = 74$) of the students in the IG had five or more correct answers out of ten specific knowledge questions about HPV. In CG1, 13% ($n = 14$) had five or more correct answers out of the ten knowledge questions.

At baseline, 15% ($n = 19$) of the students in the IG and 7% ($n = 9$) of the students in CG1 intended to be vaccinated ($p = 0.163$). Three of these students were boys (2 in the IG and 1 in CG1). Three girls in the IG (3%) and 5 girls in CG1 (4%) had been vaccinated against HPV at baseline ($p = 0.703$). At follow-up, 16% of the girls in the IG ($n = 15$) and 14% ($n = 15$) of the girls in CG1 had received the vaccination ($p = 0.667$). At that time, 8% ($n = 4$ girls and 3 boys) in the IG intended to become vaccinated and 11% of the students ($n = 8$ girls and 3 boys) in CG1 had this intention ($p = 0.344$).
The intention of using a condom with a new partner was not higher in the IG than in CG1, either at baseline or at follow-up. The intention of using a condom with a new partner, in case of HPV-vaccination was also equally positive in both groups, at baseline and follow-up ($p = 0.723$). There was no difference between the IG and CG1 in the girls’ intention to attend cervical screening, either at baseline or at follow-up ($p = 0.201$).

Study III

Main findings

The school nurses saw the free school-based vaccination program against HPV as something positive since they believed it would balance out social inequalities in vaccination coverage. However, they were discontented with the fact that this vaccination was added to their already heavy workload. To obtain consent for the vaccination from the parents and to provide information about the vaccine was seen as challenging. One question that arose was whether they should also inform boys and their parents about the vaccination. Some of the school nurses doubted the effect of the vaccine. The results were summarized by the theme Positive attitude to HPV vaccination despite many identified problems and challenges. The categories and subcategories that are included in the theme are shown in Figure 5.

Figure 5. The theme, categories, and subcategories of study III.
Perceptions of HPV vaccination

Benefits
The main advantage with the vaccination program was that it will be free of charge and therefore will, according to the nurses, even out social inequalities in vaccination coverage. They also saw a community benefit with health promotion and preventive health measures of vaccination. Other benefits they expressed about a school-based vaccination program were that the school nurse is familiar with the families, and such a program reaches many girls and would likely result in a high coverage rate. This was also seen as individual benefits for the girls. Two groups saw a benefit in the opportunity to discuss sexual issues with the children at an early age, and felt inspired by this possibility.

Challenges
The nurses believed a school-based program would be the best way to reach high vaccination coverage, but they were concerned about their task to administer the vaccine; they experienced that they did not have enough resources or enough time. They also expressed a concern for turning into a vaccination agency.

All groups identified several other challenges of the school-based vaccination program. They considered it unfair and discriminating that boys would not be offered the vaccine, since it would protect also them against HPV-related disease and contribute to herd immunity. The FGIs also involved discussions about girls’ responsibility regarding sexual and reproductive health. The nurses believed vaccination might give the girls a false feeling of security and result in a decrease in condom use and Pap smear testing. They were also worried about the vaccine’s efficacy, long-term effects, and side effects, and did not completely trust the information provided by the manufacturer.

The nurses also identified collecting informed consent from the parents as a challenge. They saw it as very time-consuming, e.g. when forms were lost.

Diverging views on information

Information difficulties
The school nurses agreed that it was important to convey uniform and neutral information about the vaccine. They stressed providing information about the vaccine as a difficulty. How should they inform girls at such a young age? Some believed that the girls were too young to understand information about the relation between HPV and cervical cancer but also that it could be difficult for the parents to understand the risk of their young daughter getting cervical cancer.
The sexual transmitted nature of the virus was also seen as challenging in connection to spreading information. Cultural differences in the perception of this might create a barrier and thereby discourage vaccination.

**Who should provide and receive information**

The nurses claimed that the child welfare center, parents, teachers, school nurses in compulsory school and high school, midwives at youth clinics, and the vaccine manufacturer all shared a responsibility for spreading information about the virus and the vaccine to parents and their children. The nurses wanted The School Health Services to provide the parents with written information on the vaccination and some nurses thought this should be complemented with verbal information at a parent-teacher meeting. However, some expressed that there were not enough resources to do this.

Opposing views were expressed as to whether or not boys and their parents should also receive some information about the vaccine.

**Perceptions of competence**

**Request for guidelines and education**

This category is in close relation to the preceding category, but this one has more focus on the nurses’ own competency to inform, not on what the information should contain or to whom it should be given. A general feeling of insecurity about their own knowledge was expressed in the FGIs. Although many of them had received information from the authorities and from the vaccine manufacturer they had largely not prioritized learning about the vaccine yet. They wished all school nurses would receive the same training so that they could provide uniform information nationally. They requested additional training and specific guidelines from the authorities as well as from the vaccine manufacturer.

**Respect for school nurses competence**

The school nurses expressed a feeling of competence in vaccinating the girls and implementing vaccination programs. They argued that they should be included in the planning phase of this vaccination program.
Study IV

The categories and subcategories that emerged through the content analysis are presented in Figure 6.

Figure 6. Categories and subcategories of study IV.

Main findings

Parental consent should always be obtained before HPV vaccination of 11 year old girls, according to the school nurses. However, they recognized problems as to when a young girl is to be regarded as autonomous and what to do in cases where a girl and her parents disagree on the decision to vaccinate, or not to vaccinate.

Complexity of consent and autonomy

No doubt about needing parents’ consent

The nurses in all groups were convinced that parental consent was needed for vaccination of an 11-year-old. They must follow the law, they said. The nurses also believed the girls were too young to make the decision themselves.

Adolescent minors’ consent could be discussed

Even though the nurses did not see any point in discussing autonomous decisions of 11 year old children, they were unsure of at what age young people should be regarded as autonomous. The age of 15 was seen as a cut-off but, according to the nurses, the law was a barrier for letting those young people consent to vaccination for themselves. They discussed as to whether deci-
sions about one’s own body should be up to the individual at age 15, comparable with decisions on hormonal contraceptives, and even abortion. Some nurses said that they would be prepared to help 15- or 16-year-olds get vaccinated without parental consent, although they saw this as an ethical dilemma.

**Striving for dialogue**
The nurses experienced the obtaining of informed consent as a process including themselves, the child and the parents. Some were prepared to work in order to create a joint agreement on what should be decided, with the HPV vaccination as well as with other vaccinations.

**Problems with obtaining consent**

**Time-consuming**
The nurses discussed how time-consuming obtaining consent for vaccinations is and they feared that this problem would increase with the school-based HPV vaccination program. They experienced how written consent forms were often returned at the last minute, lost, or signed by the children themselves. The nurses did not always have time to contact parents who did not return the consent form.

**Cultural clashes**
The nurses also discussed how cultural factors could complicate obtaining informed consent. Language barriers among immigrant parents sometimes led to consent forms not being returned. Nurses had also experienced that immigrant parents from certain cultures were more inclined to listen to authorities; therefore, they thought that more information and recommendations should come from a physician or from The National Board of Health and Welfare.

The groups expressed a concern that girls from certain cultures risk being discriminated against, as their parents might not consent to a vaccination that protects against an STI, which might be a sensitive issue.

**Disagreement between child and parent**

**Negative consequences for the child**
The nurses discussed girls who had parents who would not consent to HPV vaccination. They worried about lack of HPV protection for the girls and the cost of the vaccination for girls over 18 years old. At the time of the FGIs, HPV vaccination was not subsidized for girls over 18.
The nurses also had experiences from other vaccines, when parents wanted their child to get vaccinated but the child refused. In such cases, the nurses would not support forcing a girl to become vaccinated against her will.

**Feelings of inadequacy**

The school nurses did not only see negative consequences for girls whose parents would not consent but they also described how they would feel inadequate if they were not able to help a girl when she wanted to get vaccinated and her parents opposed it.

**Study V**

The themes and categories that summarize the results of study V are presented in Figure 7.

![Figure 7](image)

*Figure 7. The themes and categories of study V.*

**Main findings**

It was conveyed in the interviews that the parents who had accepted HPV vaccination for their young daughter had a trust in authorities’ recommendations and they felt a school-based vaccination program was convenient. They felt a responsibility to do what they can to protect their daughter from cervical cancer, which they believed is a serious disease, and therefore support vaccination. However, it was also found that parents were concerned about
unknown side effects and vaccine safety and wished for dialogue with the school nurse to straighten out any misunderstandings and questions.

Trust versus concern

Trust in authorities
Parents said that they had accepted the vaccination against HPV since they felt a trust in recommendations from authorities and experts. They had previously accepted other vaccinations offered to their children. Also, the fact that this vaccine was now also included in a school-based program was for them a sign of the vaccine being reliable.

They believed a school-based vaccination was likely to achieve a high coverage rate since it is convenient, and accessible for parents – all they have to do is sign the consent form. Several parents believed that school-based vaccination is a calm and comfortable situation; their children trust the school nurse and have their classmates close by, further simplifying matters for parents.

Trust in vaccine effectiveness and safety
Many parents expressed a trust in the vaccine effectiveness and safety even though they felt they had little knowledge about the subject. They trusted the vaccine to be well tested. However, all parents were not convinced about the vaccine’s effectiveness.

Unknown side effects worry
Many parents made comparisons to the mass swine flu vaccination in 2009–2010 that caused narcolepsy in a number of Swedish children. This incident made them think more carefully before accepting the HPV vaccinations for their daughters. They estimated the risk for serious side effects of the HPV vaccine as being lower than the potential positive effects of the vaccine.

Concern about commercial interests
Some parents were concerned about the underlying purpose of profit making in the pharmaceutical industry. They saw it as a risk that the industry had influenced the vaccine trials.

Responsibility to protect from severe disease

Concern about daughters’ future health
The interviewed parents expressed that cervical cancer is such a severe disease that they had to accept the offer of HPV vaccination. They wanted to provide the best possible protection for their daughter. It was common that they themselves or someone close to them had experience with abnormal
pap-smears, cervical cancer, or other cancer diagnosis, and therefore wanted to do what they could to protect their daughter.

**Herd immunity**

Some parents had their daughter vaccinated to protect her from a severe disease, but some also mentioned the responsibility to vaccinate in order to contribute to herd immunity. It was mentioned that many childhood infectious diseases have been eradicated in Sweden due to well functioning vaccination programs with high coverage rates.

**Information about HPV and HPV vaccination is important**

**A wish for more information and a dialogue with the school nurse**

Parents believed their knowledge about the virus and the vaccine was limited. However, some parents were satisfied with the information they had received while others wished for more information about the virus, including the seriousness of cervical cancer, and the risks and benefits of vaccination. In addition to the written material, they also wished for a dialogue with the school nurse in order to further ask questions. Also, according to some parents, the girls in school had not received sufficient information about the vaccine.

**Scary information**

Some parents were unsure of which sources of information to trust and they expressed that their daughters were afraid of serious side effects of the vaccination after having read and heard worrying information. Some parents also mentioned that a fear of injections was a barrier to vaccination. But, they believed that this barrier could be overcome by discussing the value of the vaccination, and by discussing the vaccination procedure with her, in order to make her more comfortable with the injection.

**The daughter is too young to understand complex information**

Parents mentioned that they found it difficult to talk about sexual issues such as condom use and STIs with their children. They wanted to do it but did not know at what age was the best time. Many felt that their daughter was too young to understand this information at the age of vaccination and had only informed her very briefly. Many did not involve their daughter in the decision-making about HPV vaccination because of this. One of the interviewed parents believed the girls were open to information about sexual health at this age, and another expressed that the girls probably understand more regarding sex than many parents are aware of.
Discussion

Discussion of key findings

Study I found that knowledge about HPV among high school students was poor and few were aware of the possibility of being vaccinated against HPV, even though the marketing of the vaccines was intensive at that time. Over 40% of students reported having had sexual intercourse, which indicates that information and counseling regarding prevention of HPV should start in compulsory school, before many of the students risk being exposed to the virus. The students were interested in receiving more information about HPV and HPV prevention from the school nurse, which points to her or his important role in the preventive work of HPV and HPV-related disease.

In the second study we evaluated the effect of an educational intervention concerning HPV and HPV prevention. The intervention was developed specifically for high school students, and included an educational lesson, a pocket-sized folder, and a website. We succeeded with increasing the students’ knowledge, which was one of our aims. However, our attempt to improve the attitudes toward condom use, vaccination, and, among girls, the attitudes to cervical cancer screening, was not successful. Attitudes toward condom use were equally positive before and after the intervention, both in the IG and in CG1. It was difficult to improve students’ attitudes on condom use with the intervention, since their attitudes in this case were already very positive at baseline. Likewise, attitudes on HPV vaccination and cervical cancer screening did not change after the intervention. However, about 15% of the girls, both in the IG and CG1 had been vaccinated between baseline and follow-up. The so-called Hawthorne effect, i.e. simply being part of the study, might have been enough for some girls in CG1 to take action and have the vaccination done. The factor of time in combination with the intensive marketing of the vaccines at that time could also have had an effect.

It is also worth highlighting that according to most students in the IG, the lesson was the most appreciated part of the intervention. Many students reported that they had not visited the website or read the pocket-sized folder. It appears that personal contact through a one hour lesson can make a bigger impression than distributed written material and an easily accessed website. This demonstrates that simple and short interventions with limited resources can improve knowledge about HPV and preventive methods.
The conclusion of study I and II is thus that information about this virus and preventive methods should be added in the SRH education in grade 7–9 in compulsory school. A suggestion could be to include a discussion about HPV and HPV prevention in the individual health interview that school nurses conduct with each student in eighth grade and in the first year of high school.

However, knowledge represents only one step in the process of changing to a preventive behavior. Changing a person’s behavior is much more complex than increasing her or his knowledge. According to the Health Belief Model, the potential benefits of the preventive behavior have to be considered to outweigh the cost or other possible barriers. The person must also be convinced that he or she can successfully execute the required behavior (self-efficacy). To increase the students’ self-efficacy to use condoms, a game where the students were to open a condom package and practice rolling it out was included in the intervention, as well as discussion about how to communicate safer sex. However, sexual behaviour is complex and often influenced by a partner, and therefore could not completely be explained by the HBM.

The perceptions of school nurses is presented in Study III and IV, and are summarized in the main theme “Positive attitude to HPV immunization despite many identified problems and challenges.” The school nurses discussed HPV vaccination in relation to the ethical principle of justice. They believed that the new school-based vaccination program would balance out social and economical inequalities among the girls since all girls in the age group 10–12 years old will be offered the vaccine free of charge. However, they questioned the justice in not offering the vaccine free of charge to older girls and to boys, in accordance with Bennett, who argues that according to the principle of justice, both women and men should share the benefits and burdens of any vaccination. The school nurses were also unsure of whether or not they should provide boys and their parents with information about the vaccine. The notion that women should take care of “everything” concerning sexual and reproductive health seemed to irritate the nurses. This notion, that women are seen as more responsible and caring than men, is in line with gender theories about the construction of femininity and masculinity.

The school nurses expressed that they wanted to convey neutral and adequate information to the parents and to the girls, to enable them to make an informed decision. However, they were not sure of what information should be included and how detailed it should be. They also discussed the risk–utility consideration regarding that the vaccine might lead to a false feeling of security among the students. In accordance with the ethical principles of nonmaleficence and beneficence, the advantage of a school-based vaccination program can be weighed against the risk of a false security, leading to increased sexual risk-taking.
Obtaining informed consent was also seen as problematic. The school nurses saw it as an ethical dilemma when a girl wanted to be vaccinated but the parents refused. The parents’ right and responsibility to make autonomous decisions on behalf of their child versus the girl’s integrity and right to make her own autonomous decision, and also the school nurse’s obligation to promote health and well-being among the students, are all conflicting values. The girl’s best interest could be different according to parents, the girls herself, and the school nurse. To facilitate obtaining informed consent, or at least to make conflicts of interests visible and possible to deal with, a more relational approach towards how consent is obtained was suggested in study IV. This approach allows an improved dialogue and communication between the school nurse, the parents, and the child, which might increase the autonomy of the child and reduce power inequalities. However, this approach requires more resources.

The FGIs with school nurses revealed a lack of knowledge regarding the vaccination against HPV and also a willingness to learn more about the subject. However, this study was done before the vaccinations had started in schools, and it is possible that school nurses’ knowledge has improved since the study was performed. The school nurses expressed concerns about lack of resources to perform the vaccinations. Whether this concern became an actual problem in reality needs to be investigated.

The fifth study – exploring how parents of young girls reason when they accept HPV vaccination in the school-based program – revealed that parents have a high level of trust in recommendations from authorities and therefore believed HPV vaccination was a good thing. The parents also expressed that they wanted to do what they could to protect their daughter from cervical cancer, which they perceived to be a severe disease. These findings are in line with previous studies. A school-based vaccination program was considered convenient for the parents and facilitated their decision. Concerns about side effects and vaccine safety were brought up by the parents and many drew parallels to the mass vaccination against the so-called swine flu in 2009–2010 which caused unforeseen cases of narcolepsy in children. The parents described how they considered the risks versus benefits of vaccinations more carefully after the swine flu vaccination. They wished for more adequate information and a dialogue with the school nurse to be able to fill the knowledge gaps. This points to the important role of the school nurse when it comes to information and providing opportunities for informed decisions in school-based vaccination programs.

Few parents had discussed HPV and HPV prevention with their daughter because they felt that the daughter was too young to understand this complex subject. In this context, it is interesting to note that a Swedish study from 2008 found that 12 year old girls would like to discuss sexual issues with adults but felt that this need had not been met, since they experienced that adults believed the girls were too young. Another explanation for parents
not discussing HPV prevention with their daughter could be that they felt that their own knowledge level was too low to discuss the subject. A low level of HPV vaccine knowledge has been found in Sweden earlier.\textsuperscript{52}

Future studies

Further studies are needed about what knowledge girls who have been offered the HPV vaccine in the school-based program have about HPV and HPV-prevention around the time of their sexual debut. It would also be of value to study how school nurses experience the vaccination program after its initiation, to see if their concerns before the program started are consistent with their actual experiences.

Methodological considerations

Validity and reliability (study I & II)

Validity and reliability are common criteria for assessing quality in quantitative research. Validity is the degree to which an instrument measures what it is supposed to measure, while reliability is the consistency with which an instrument measures what it is supposed to measure.\textsuperscript{102} Both of these quality criteria have several aspects and assessment approaches.

External validity, or generalizability, refers to how well the results apply to the target population. The sampled schools in our studies were strategically chosen by the research group in order to obtain schools from areas with different characteristics, and schools with both vocational and theoretical high school programs. The principal of each school strategically chose the classes to obtain about the same number of girls and boys. There is a risk of selection bias, but we considered a strategic sample better suited than a randomized sample, to receive a broad variety of schools in different settings.

Data collection via questionnaires in a classroom setting often gives a high response rate since most students who are in the classroom fill in the questionnaire. The response rate of 86\% in study I, is satisfactory but the response rate at follow-up in study II, is below what was required to obtain a power of 80\%. There is therefore a risk of type II errors, \textit{i.e.} that conclusions based on statistically significant differences between groups are unaffected while non-significant differences have to be cautiously interpreted due to lack of power. Data collection via questionnaire also has limitations. Our potentially embarrassing questions might have influenced the results; the reported attitudes might not reflect the real attitude of the participant. There is also a possibility of non-response bias, but we assume that the non-respondents did not have better knowledge regarding HPV and a lower initial knowledge score would not alter the results significantly. We consider it
possible to generalize the results from study I and II to similar settings in Sweden, since the results correspond to those of a similar prior study.\textsuperscript{54} The questionnaires were specifically made for the studies, but many questions had been used in previous studies among high school- and university students.\textsuperscript{54,103} Similarities in the results indicate reliability of the instrument. Senior researchers in the research group are experts in the area of sexual and reproductive health and confirmed content validity and the face validity of the questionnaire. A pilot study was also performed among high school students, to enhance rigor.

Trustworthiness (study III, IV, & V)

Credibility, dependability, confirmability, and transferability – the quality criteria for discussing trustworthiness in qualitative research, introduced by Guba and Lincoln\textsuperscript{104} – has been regarded.

\textit{Credibility} refers to the confidence in the truth of the data and interpretations of them, \textit{i.e.} what in quantitative studies is referred to as validity. In this thesis, credibility was ensured through investigator triangulation, when at least two persons collected and analyzed the data.\textsuperscript{104} The whole research group also discussed the composition of themes, categories, and sub categories until a consensus was reached. Member checking was used in the way that the observer (study III and IV) or the interviewer (study V) summarized what had been said and discussed by the participants/participant at the end of each FGI/interview. Peer debriefing\textsuperscript{104} was used in study IV, in the form that it was presented at seminars where both PhD students and senior researchers reviewed and discussed the analysis and results. The participants in study III and IV comprised of only female school nurses. However, most school nurses in Sweden are female, so this reflects the population. Also, in the fifth study, the participating parents consisted mainly of females. In line with gender theories this can be an example of the fact that women are often responsible for the caring tasks in the family, and that the private sphere, the family and the children, is their domain.\textsuperscript{83,85} This might have biased the results, but we believe the risk is small if mainly women are the ones making the decision about HPV vaccination.\textsuperscript{105}

\textit{Dependability} refers to data stability (reliability) over time and over conditions. Would the findings be the same if the study were repeated with the same (or similar) participants in the same (or similar) context? To aim at dependability, all interviewers used the same interview guide in order to keep focus on the research questions. The analyzing process was systematic and rigorous and the researchers often returned to the transcripts to check that all data were carefully analyzed.

\textit{Confirmability} refers to the objectivity or neutrality of the data, \textit{i.e.} the potential that the findings of the study, and its accuracy, relevance, or meaning are agreed upon between two or more people. For this criterion to be
achieved, the findings must represent the information the participants provided and not the bias or perspectives of the researcher. To achieve confirmability, data analyses were aimed to be systematic and thorough. They were performed by two researchers and then discussed in the research group. Examples of the analysis process were included (study III and IV) and quotes from the FGIs and interviews (study III–V) were presented to confirm that themes and categories were well grounded in the data.

Transferability refers to the generalizability of the data, i.e. the extent to which the findings can be transferred to other groups or settings. The researchers should provide enough descriptive data in the research report so that the readers can evaluate the transferability of the data to other contexts. In order to achieve this, we have provided a thorough description of setting, participants, procedure and analysis.
Conclusions

Knowledge about HPV and HPV vaccine is low among Swedish high school students, but their attitudes to HPV vaccination are nevertheless positive. They want to receive more information about HPV and HPV vaccination before considering vaccination, and they prefer to receive this information from the school nurse. The students need to be informed about HPV before their sexual debut, which is their first possible exposure to the virus. The short school-based intervention we performed greatly increased the students’ knowledge about HPV, but their attitudes, and possibly also their behaviors, were less easy to influence.

The interviewed school nurses mentioned some positive aspects of the new HPV vaccination program, but their discussion focused on problems and challenges with the program, regarding e.g. informed consent, gender, and priority setting. Regarding informed consent, the nurses identified an ethical dilemma when a child and her parents do not agree on the decision about vaccination. The conflicting values could in such cases be the child’s right to self-determination, the parents’ right to make autonomous choices on behalf of their children, and the nurse’s obligation to promote health and well-being among the students. In order to achieve a good work environment for the school nurses, and to obtain a high coverage rate for HPV vaccination, these issues need to be taken seriously, to be discussed, and to be acted upon. A solution suggested to the ethical dilemma regarding informed consent is to see the obtaining of consent as a deliberative and communicative process, including the child, the parents, and the school nurse. Using such an approach, conflicts of interests are made visible and become possible to deal with in a dialogue involving the child, the parents, and the school nurse. Possibly, a decision that all parties can accept may be reached. However, in order to be able to work in this manner, more resources are required.

The interviewed parents consented to HPV vaccination for their daughter since they trusted the recommendations from authorities, and also wanted to protect their daughter from a severe disease. They had concerns about side effects and commercial interests but these were outweighed by the benefits of vaccination. The parents highlighted the convenience of a school-based vaccination program, and the school nurse as an important source of information about HPV and HPV vaccination.

High school students and many parents want more information about HPV from school nurses, which show that school nurses have an important
role in spreading information about HPV prevention. A positive attitude to HPV vaccination despite lack of knowledge about HPV seems to be an overarching theme in the studies presented in this thesis. It is important that the concerned parties – youths, parents, and school nurses – are adequately informed about HPV and its preventive methods, so that they can make an informed decision about HPV vaccination, and for school-nurses to be able to answer questions from youths and parents. From a public health perspective, high vaccination coverage is important as it can lead to a reduced number of HPV-related disease cases. This thesis has found that personal communication and dialogue is important in increasing HPV knowledge among youths and parents, and that knowledge about HPV can be greatly improved through educational interventions.
Humana papillomvirus (HPV) finns i över 150 olika typer. Omkring 40 av dessa överförs sexuellt och kan orsaka infektion i genitalier och anus samt munhåla och svalg hos både kvinnor och män. En HPV-infektion kan orsaka cellförändringar, som i sin tur kan leda till cancer. De HPV-typer som kan orsaka cancer kallas för högrisk eller onkogena virustyper, och är HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58 och 59.5,7 HPV 16 och 18 beräknas orsaka 70 % av alla livmoderhalscancerfall. En HPV-infektion med någon av högrisktyperna är en förutsättning för att utveckla livmoderhalscancer.6 HPV-typerna 6 och 11 ses som lågrisktyper och orsakar könsvårtor (condylom) och den sällsynta sjukdomen respiratorisk papillomatos som främst drabbar spädbarn och unga.8

De flesta sexuellt aktiva människor smittas någon gång i livet av HPV, som räknas som den vanligaste sexuellt överförbara infektionen i världen. De flesta märker inte av att de smittats utan infektionen läker av sig självt. Ibland kan dock infektionen bli långvarig och orsaka cellförändringar och cancer.5 Att använda kondom på rätt sätt ger ett bra skydd mot HPV,39 men eftersom viruset överförs också genom hudkontakt, kan det överföras trots att kondom används.40

Sedan 2006–2007 finns två vaccin mot HPV. Det ena, Cervarix (GSK), skyddar mot HPV 16 och 18, och det andra vaccinet, Gardasil (Sanofi Pasteur, MSD), skyddar mot HPV 16 och 18 samt mot typerna 6 och 11, som orsakar könsvårtor.25 Vaccinerna verkar profylaktiskt och kan inte bota en redan pågående infektion – därför rekommenderas att vaccinationen görs innan sexdebut.28,29

Utgångspunkter


När vaccinationsprocessen till slut startade i skolor genomförde vi delstudie fem, vars syfte var att undersöka hur föräldrar resonerar när de accepterar HPV-vaccinering för sin unga dotter, samt hur de ser på HPV-relaterad information. Forskargruppen har även undersökt hur föräldrar som tackat nej till HPV-vaccination resonerar, men det är inte del av denna avhandling.

Både kvalitativa och kvantitativa metoder har således använts i avhandlingens delarbeten.

Sammanfattning av resultaten
Gymnasieelevers kunskapsnivå om HPV och HPV-prevention är låg men de har ändå en positiv attityd till HPV-vaccination. Pojkar och elever på yrkesförberedande gymnasieprogram har generellt sett en lägre kunskapsnivå än flickor och elever på studieförberedande gymnasieprogram. Vi genomförde en utbildningsintervention i klasser i gymnasiets första år, bestående av en lektion om HPV, kondomanvändning och HPV-vaccination, en webbsida samt en liten informationsfolder. Interventionen ökade elevernas kunskaper om HPV och HPV-prevention betydligt. Deras redan positiva attityd till kondomanvändning och HPV-vaccination förbättrades dock inte ytterligare av interventionen. Eleverna tyckte att lektionsdelen av interventionen var den mest lärorika och de önskade mer information om HPV från skolsköterskan.

I den tredje delstudien framkom att skolsköterskor också var positivt inställda till HPV-vaccination. Samtidigt identifierade de många problem och utmaningar – dels med det skolbaserade vaccinationsprogrammet i sig, dels relaterade till informationen om viruset och vaccinet. Problemen och utmaningarna som nämndes rörde prioriteringar i arbetet, kultur, genus och inhämtande av samtycke. Skolsköterskorna kände sig osäkra på hur de skulle informera, vilken och hur detaljerad information som skulle ges, samt till vilka information om viruset och vaccinet skulle ges.

I den fjärde delstudien behandlades de problem och etiska dilemma med att inhämta samtycke som skolsköterskor identifierat. Vad ska de göra när föräldrar och barn inte kommer överens om besluten att vaccinera eller att inte vaccinera? I artikeln diskuteras hur samtycket kan ses som en rådgi-
vande och kommunikativ process, där den unga flickan, föräldrarna och skolsköterskan deltar tillsammans. En sådan dialog kan synliggöra intressekonflikter och genom det göra dem möjliga att hantera. Detta kan möjliggöra ett beslut som både flickan, föräldrarna och skolsköterskan kan acceptera.

I den femte delstudien framkom att föräldrar som tackat ja till HPV-vaccination för sin 10–12-åriga dotter i det skolbaserade programmet, hade gjort det för att de litade på myndigheters rekommendationer. Ett vaccin som rekommenderas av myndigheter och som dessutom ges i skolan, är sannolikt säkert och effektivt, ansåg många föräldrar. Föräldrarna ville göra vad de kunde för att minska dotterns risk för att drabbas av en allvarlig sjukdom som livmoderhalscancer. En oro för oväntade bieffekter fanns och hade väckts av att vaccinet mot den så kallade svininfluensan hade orsakat narkolepsi hos flera svenska barn något år tidigare. Denna oro övervägdes dock av de förväntade positiva effekterna av vaccinet. Föräldrarna såg skolsköterskan som en viktig källa för information om HPV och HPV-vaccin.

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