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How to Prevent Sexually Transmitted Infections Knowledge Test for Adolescents

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<p>Knowledge on sexually transmitted infections (STIs) remains to be insufficient among Finnish adolescents. Chlamydia trachomatis, genital herpes and genital warts/condyloma are the most prevalent STIs among this age group. The purpose of this thesis was to produce a knowledge test for adolescents about symptoms and prevention of these infections. The aim of this thesis was to promote sexual health and to improve Finnish adolescents' knowledge about these STIs.</p> <p>Data for the literature review was collected from the databases Ovid Nursing Database, CINAHL and the Finnish database Terveystietokanta/Sairaanhoitajan tietokanta. The articles (n=25) were analysed according to the principles of content analysis. Results were categorized into "symptoms of chlamydia trachomatis", "symptoms of genital herpes", "symptoms of genital warts/condyloma" and "prevention of chlamydia trachomatis, genital herpes and genital warts/condyloma".</p> <p>The results gained from this literature review synthesize contemporary scientific knowledge on the large variety of symptoms and on prevention of these infections. In addition, the results show that they often occur without symptoms. Condoms remain to be the safest method of preventing transmission but do not protect from all STIs.</p> <p>The results can in the future serve as a base for a knowledge test for adolescents about chlamydia trachomatis, genital herpes and genital warts/condyloma. The knowledge test could be used in nursing practice as a tool to collect research data among young people.</p>	
Keywords:	sexually transmitted infections, symptoms, prevention, chlamydia trachomatis, genital herpes, genital warts/condyloma, adolescents, knowledge test

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<p>Suomalaisten nuorten tietotaso sukupuolitaudeista on riittämätön. Nuorten yleisimmät sukupuolitaudit ovat klamydia, genitaalierpes ja visvasyyllät/kondylooma. Tämän opinnäytetyön tarkoituksena oli tehdä nuorille tietotesti kyseisten tautien oireista ja ehkäisystä. Opinnäytetyön tavoitteena on edistää seksuaaliterveyttä sekä parantaa suomalaisten nuorten tietotasoa sukupuolitaudeista.</p> <p>Kirjallisuuskatsauksen aineisto kerättiin Ovid Nursing Database:n, CINAHL:n, sekä suomalaisen Terveysportin Sairaanhoidajan tietokannoista. Artikkelit (n =25) analysoitiin käyttäen sisällönanalyysin periaatteita. Tulokset kategorisoitiin ryhmiin ”klamydian oireet”, ”genitaalierpeksen oireet”, ”visvasyyllän/kondylooman oireet”, sekä ”klamydian, genitaalierpeksen ja visvasyyllän/kondylooman ehkäisy”.</p> <p>Kirjallisuuskatsaus tuotti tietoa sukupuoliteitse tarttuvien sukupuolitautilien oireista ja ehkäisystä. Tulokset osoittavat, että klamydia-, genitaalierpes- ja visvasyyllä/kondyloomainfektiot esiintyvät useasti oireettomina. Kondomit ovat edelleen turvallisin ehkäisykeino sukupuolitautilien leviämistä vastaan, mutta ne eivät ehkäise kaikilta sukupuolitaudeilta.</p> <p>Opinnäytetyön tuloksia voidaan hyödyntää nuorille suunnatun tietotestin rakentamisessa. Tulosten perusteella voidaan tuottaa väittämiä klamydiasta, genitaalierpeksessä ja visvasyyllästä/kondyloomasta. Lisäksi tietotestiä voidaan myös hyödyntää hoitotyössä työkaluna, jolla arvioidaan nuorten tietotasoa sukupuoliteitse tarttuvista taudeista.</p>	
Avainsanat:	sukupuolitaudit, oireet, ehkäisy, klamydia, genitaalierpes, visvasyyllä/kondylooma, nuoret, tietotesti

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1 Introduction

Sexually transmitted infections (STIs) remain to be a significant threat to health in many countries (ECDC 2009:1) and knowledge about STIs is in general insufficient (Kontula 2010). This is true also in Finland. In year 2011, there were 327 766 adolescents between 15-19 years living in Finland (Statistics Finland 2012). Among this age-group there were 3218 newly reported chlamydia cases in 2012 (National institute for health and welfare 2012).

WHO Europe has published standards for sexuality education in Europe. This education should be a continuous process for children and adolescents with different topics being taught as early as possible according to the child's developmental phases. It is suggested that symptoms, risks and consequences of unsafe sex and sexually transmitted infections are taught at the age of nine to twelve years. Adolescents 15 years old and older should receive detailed information about transmission, prevention, treatment of STIs as well as about available support. (WHO Regional office for Europe and BZgA 2010: 43-50.)

The Finnish National Board of Education provides a national core curriculum, which sets the objectives and main contents for general upper secondary education. According to the recommendations, sexuality education should include the following topics: "Sexual health, the couple relationship, family and the social legacy of previous generations" (Finnish National board of Education 2003: 215). Considering the WHO Europe recommendations and looking at the guidelines of compulsory health education in upper secondary schools in Finland, it appears that the Finnish guidelines are very vague and leave the responsibility of the concrete content of the education to a large extent up to the teachers' preferences.

Sexual health education is part of health promotion and prevention of illness. Both health promotion and prevention of illness are major ethical responsibilities in nursing practise (Fry & Johnstone 2008: 69, 81). Promoting sexual health among Finnish adolescents is important, as there exists a high prevalence of STIs among young people.

This thesis discusses the knowledge about sexually transmitted infections (STIs) among adolescents aged 15-19 in Finland and the major trends in sexual behaviour

among Finnish adolescents. In the future, the results of this thesis can be used to create a knowledge test for adolescents about chlamydia trachomatis, genital herpes and genital warts/condyloma. The aim of this thesis was to promote sexual health and to improve Finnish adolescents' knowledge about the STIs chlamydia trachomatis, genital herpes and genital warts/condyloma.

2 Adolescents and sexually transmitted infections

2.1 Adolescents as a focus group

According to Oxford Advanced Learner's Dictionary (2000: 17), the term adolescent is defined as "a young person who is developing from a child into an adult". In this thesis the focus group includes adolescents between the ages of 15-19 years. The age group 15-19 years was chosen since by this age adolescents in Finland have all been taught compulsory health education in primary school and students in upper secondary school have attended additional compulsory health education lectures. This indicates that, by this age, the students have received all the education about sexually transmitted infections that they will be provided by the public school education.

2.2 Sexually transmitted infections

According to the WHO (2013), STIs are defined as follows:

Sexually transmitted infections (STIs) are infections that are spread primarily through person-to-person sexual contact. There are more than 30 different sexually transmissible bacteria, viruses and parasites.

The most common conditions they cause are gonorrhoea, chlamydial infection, syphilis, trichomoniasis, chancroid, genital herpes, genital warts, human immunodeficiency virus (HIV) infection and hepatitis B infection.

Several, in particular HIV and syphilis, can also be transmitted from mother to child during pregnancy and childbirth, and through blood products and tissue transfer.

Statistics and HUS (The Hospital District of Helsinki and Uusimaa) show that the three most prevalent STIs among all age groups in Finland are chlamydia trachomatis, genital herpes and genital warts/condyloma (HUS 2006; Käypä hoito 2010). Chlamydia is one of the notifiable, communicable infections, which means that reliable statistics can be found. According to Hulkko, Lyytikäinen, Kuusi, Seppälä and Ruutu (2010: 36) and

statistics from National institute for health and welfare (2012), the number of chlamydia cases has remained stable and high among Finnish citizens for a decade and it is very predominant in the young age groups. The research indicates that within the chlamydia cases among people under 20 years of age, the infection is significantly more common in females than in males (Hulkko et al. 2010: 36). National institute for health and welfare's statistics of the year 2012, point out same tendencies: In 2012 approximately 76.5% of chlamydia cases in adolescents occurred in females (National institute for health and welfare 2012).

There are no Finnish statistics about the prevalence of the viral STIs genital herpes and genital warts/condyloma caused by HPV. However, according to estimations, about 20%- 25% of Finnish citizens are carriers of genital herpes and 1/3 of young adults are carriers of the genital warts/condyloma caused by HPV (Hiltunen-Back & Aho 2005: 84; HUS 2006).

2.3 Adolescents and STIs in Finland

STIs continue to pose a tremendous public health problem (ECDC 2009: 1). According to studies conducted by Kontula (2010) and Kontula and Meriläinen (2007: 5), Finnish adolescents have better knowledge about STIs and sexual matters than adolescents in other countries where comparable studies were conducted. There is a trend that Finnish adolescents start dating and have first sexual intercourse experiences at an increasingly early age. Hence, sexual education in school is provided at an early age for the students and it has improved over the years. Good performance at school correlates with a higher level of sexual knowledge in Finnish adolescents. However, there exist noticeable differences in the knowledge about STIs and sexual matters between boys and girls, girls having a significantly vaster knowledge than boys. (Kontula 2010; Kontula & Meriläinen, 2007: 5, 15, 45.)

Nikula (2009) discusses behavioural risk factors for STIs among young citizens. Risk factors are considered to be e.g. not using a condom, substance use or partnering patterns (casual partnering, multiple partnering) (Nikula 2009: 22-25, 30-32, 35- 37). In general, young men and women show minor differences in their sexual behaviour. According to the dissertation, both alcohol and drugs are strong correlates and predictors for sexual risk behaviour and self-reported STIs in Finland. The strongest risk factor for

multiple partners is alcohol consumption (frequency and drunkenness) (Nikula 2009: 6, 56). An example of sexual risk behaviour in another study is the fact that only half of young adults reported having recently used condoms. Condom use was significantly more common on the youngest age groups: 18-19years and 20-24 years. Figures of the study show that in the age group of 18-19-year-olds only 55% of males and 30% of females reported having consistently used a condom with a casual partner during the past year. (Nikula, Koponen, Haavio-Mannila & Hemminki 2007.)

Adolescents are aware of condoms being the safest means of protection against STI transmission and STIs being transmitted via mucous membranes. However, Kontula and Meriläinen (2007) found that adolescents had weak knowledge on condyloma and herpes, on how STIs are tested and on how they are treated. As stated by the authors, many adolescents are not aware of the fact that some STIs, as e.g. herpes, cannot be cured. The most severe lack of knowledge was that STIs can be present without any symptoms. The researchers discuss that unawareness about this fact leads to spreading of STIs. According to the researchers, adolescents do not know of the possibility to test for a possible STI at a local health care centre or at a school doctor's appointment. There was also a lack of information that treatment of STI also includes treating the current and previous partner or partners. (Kontula & Meriläinen 2007: 76.) Finnish adolescents have poor knowledge about the often asymptomatic nature of STIs, about possible transmission of an STI in the absence of symptoms and about which STIs are curable and which ones are not. These previous research findings encouraged the authors of this thesis to conduct further research on these subjects.

3 Purpose, aim and study questions

The aim of this thesis was to promote sexual health and to improve Finnish adolescents' knowledge about the STIs chlamydia trachomatis, genital herpes and genital warts/condyloma. The purpose was to produce a knowledge test for adolescents about chlamydia trachomatis, genital herpes and genital warts/condyloma. The study questions were:

- What are the symptoms of chlamydia trachomatis, genital herpes and genital warts/condyloma?
- How are sexually transmitted infections prevented?

4 Data collection method, data collection and data analysis

4.1 Literature review

A literature review gives the reader an impression on what is currently known on a certain topic of interest. In a literature review, previous knowledge and publications by scholars on a certain subject are synthesized and reflected on. It is a written presentation on research carried out in a field of study. (Burns & Grove 2009: 91-92.) The conducted literature review is based on data search (LoBiondo-Wood & Haber 2006: 87). The data collection method used in this thesis was a literature review. The findings of the literature review could be used in the future for developing items for a knowledge test for adolescents about chlamydia trachomatis, genital herpes and genital warts/condyloma.

4.2 Inclusion criteria for the data and data collection

The following inclusion criteria were applied in the data search: only research articles/material published during the years 2002 to 2013 were included, language of publication was either English or Finnish, only primary sources were included, the research had to be relevant to Europe or the western world, the research had to include heterosexuals and the research article had to be relevant to our study questions.

Data for the literature review was collected by using the databases Ovid Nursing Database, CINAHL and the Finnish Terveystietokanta/Sairaanhoidajan tietokanta (Registered Nurses' Database). The process of choosing the articles for the literature review of this thesis was the following:

1. Selection based on title,
2. Selection based on reading abstracts
3. Selection based on reading the whole publication.

Search terms in this thesis in Ovid Nursing Database and CINAHL were: "Sexually transmitted infections" AND "prevention", "Sexually transmitted infections" AND "prevention" AND "Nursing", "Chlamydia trachomatis" AND "symptoms", "Genital herpes" AND "symptoms", "Condyloma" OR "genital warts" OR "HPV" AND "symptoms". Search terms for Terveystietokanta were "Klamydia" (chlamydia), "Genitaaliherpes" (genital herpes), "HPV" and "Ehkäisy" (prevention).

The data search in Ovid Nursing Data and CINAHL was conducted with the different search term combinations and resulted in 614 hits. After reading the titles, 132 of those articles were included. After reading the abstracts of all articles, 44 of the articles were chosen for further reading. One of the articles could not be obtained in full text, so it was excluded from this study.

All 44 articles were read through by all three authors of this thesis. A dialogue among the co-authors was carried out to determine which articles to include into the analysis process of this thesis. Consensus for inclusion of an article had to be reached by two out of three authors.

Of the 44 articles found from the databases which were read completely, 14 articles were found to be relevant for the thesis. These were read more in depth in full text, each by minimum of two authors.

In Terveysportti the articles were exclusively found in the section "highly relevant". Based on the titles, 11 articles were chosen for thorough reading. All 11 articles were included into the data of this thesis. Also during this phase, a consensus of two out of three authors was reached on whether to include an article or not.

Table 2. Database search in Ovid Nursing Database and CINAHL

Database and limitations	Search terms	hits	chosen by title	chosen by abstract	chosen by reading
CINAHL limitations: 2002-14 th March 2013, research article, English language	"Sexually transmitted infections" AND "prevention"	382	70	14	5
	"Sexually transmitted infections" AND "prevention" AND "Nursing"	15	5	1	0
	"Chlamydia trachomatis" AND "symptoms"	39	12	9	4
	"Genital herpes" AND "symptoms"	13	5	4	2
	"Condyloma" OR "genital warts" OR "HPV" AND "symptoms"	104	21	8	3
Ovid Nursing Database limitations: 2002-2013 (15 th May), English, humans, nursing journal	"Sexually transmitted infection" AND "prevention"	29	9	5	0
	"Sexually transmitted infection" AND "prevention" AND "Nursing"	21	6	1	0
	"Chlamydia trachomatis" AND "symptoms"	2	0	nothing to be saved	0
	"Chlamydia" AND "symptoms"	8	2	2	0
	Genital herpes" AND "symptoms"	4	1	0	0
	"Condyloma" OR "genital warts" OR "HPV" AND "symptoms"	3	1	0	0
Total		620	132	44	14

Table 2. Database search in Terveystietokanta

Database and limitations	Search terms	hits	chosen by title	chosen by reading
Terveystietokanta: sairaanhoitajan tietokanta limitation: "highly relevant"	"klamydia"	5	4	4
	"hpv"	12	2	2
	"genitaaliherpes"	5	4	4
	"ehkäisy"	23	1	1
Total		45	11	11

4.3 Data Analysis

Content analysis is a systematic and objective research method that is content-sensitive and flexible in describing and quantifying phenomena. It is a method used among others in nursing research to analyse data. Content analysis can be performed in an either inductive or deductive way, depending on the purpose of the study. If there is insufficient or fragmented knowledge on a phenomenon, inductive content analysis is the chosen approach. When testing theories or analysing previous knowledge, deductive content analysis is performed. (Elo & Kyngäs 2008.)

According to Burns and Grove (2005), content analysis is a method for the researcher to classify and categorize words, phrases and sentences according to theoretical importance. To measure the content, the researcher must first decide on the characteristics of the content to be analysed. The next step is to decide on how to identify these characteristics. Words, word combinations or themes can be chosen to be symbolic entities. In the analysing process, these entities are looked for in the text. In this way the frequency, order or intensity of e. g words can be measured in a systematic manner. The symbolic entity can be analysed while considering it in the context of the whole text. Constructing idea categories is of great importance in content analysis. These categories are quantified according to specific rules. Categories work as representatives of ideas and support the process of analysis. (Burns & Grove 2005: 554-555.)

In this thesis content analysis was conducted using the principles of the inductive approach. The main categories for the initial analysis of content of the articles were derived from the study questions: 'symptoms' and 'prevention'. While reading the articles, the main categories were divided into subcategories: 'symptoms of chlamydia trachomatis', 'symptoms of genital herpes', 'symptoms of genital warts', 'prevention of chlamydia trachomatis', 'prevention of genital herpes' and 'prevention of genital warts'. Symptoms of each of the researched STI were further divided into 'symptoms in females' and 'symptoms in males.'

5 Results

The results of this thesis are based on a literature review of 14 research articles found in CINAHL and Ovid Nursing Database and 11 articles found in Terveysportti.

In general, the results show that people are not aware that STIs can be asymptomatic. According to Royer and Zahner (2009), many people lack awareness that a partner can be a carrier of an STI even if he/she looks alright and/or shows no symptoms. In another study, a third of the study participants of their research (n=2058) assumed physical complaints to always come along with an STI. The participants' main reason for not getting tested for STIs was the absence of symptoms. (Wolfers, de Zwart & Kok 2011.)

Symptoms of STIs in general are discussed by Hanhirova (2012c). Systemic symptoms in both females and males include fever, headache, sore throat, muscle and joint pain as well as swelling of lymph nodes, particularly in groins. Local symptoms include oral, genital and rectal ulcers, warts, blisters, itch, burn, frequent urination and dysuria. In women, increased vaginal discharge, pelvic inflammatory disease, abdominal and lower back pain can occur. In male, mucopurulent discharge from urethra and epididymitis can be witnessed. (Hanhirova 2012c.)

5.1 Symptoms of chlamydia trachomatis (CT)

There is an abundance of academic literature on symptoms of chlamydia trachomatis. It is a widely proven fact that the majority of chlamydia trachomatis infections are asymptomatic in both women and men (Bakken et al 2007; Chen, Rohrsheim & Donovan 2005; Cole & Jasiak 2004; Hanhirova 2012b; Hiltunen-Back 2009a; Tiitinen 2012a; Ylikangas 2011). Hiltunen-Back (2009a) mentions that women often have either mild or no symptoms. Tiitinen (2012a) also states that at least 90% of women and 50% of males are asymptomatic. The author continues to explain that people easily remain asymptomatic carriers, as one quarter of males and most women do not notice any symptoms.

However, there exist a variety of symptoms that are attributed to chlamydia trachomatis. In women, chlamydia trachomatis often causes abnormalities in vaginal discharge (Cole & Jasiak 2004; Hanhirova 2012b; Hiltunen-Back 2009a; Tiitinen 2012a;

Ylikangas 2011) and irregular (menstrual) bleeding can occur (Cole & Jasiak 2004; Hanhiova 2012b; Hiltunen-Back 2009a; Tiitinen 2012a). Cole and Jasiak (2004) mention dysmenorrhea in addition to these symptoms related to menstruation. Dyspareunia (Cole & Jasiak 2004) and post-coital bleeding can also be a sign of a chlamydia trachomatis infection (Chen et al. 2005; Cole & Jasiak 2004; Hanhiova 2012b; Ylikangas 2011). Urinary symptoms (Cole & Jasiak 2004), dysuria (Chen et al. 2005; Hanhiova 2012b; Hiltunen-Back 2009a; Tiitinen 2012a) and frequent urination (Hanhiova 2012b; Ylikangas 2011) are common urinary symptoms in females with chlamydia trachomatis. Women with chlamydia trachomatis infection can suffer from abdominal pain (Cole & Jasiak 2004; Hanhiova 2012b; Hiltunen-Back 2009a; Tiitinen 2012a; Ylikangas 2011) or lower back pain (Hanhiova 2012b; Ylikangas 2011) as well as pelvic inflammation (PID) with fluctuation of none to severe symptoms (Hanhiova 2012b).

In men, urinary symptoms are predominant in chlamydia trachomatis infection (Cole & Jasiak 2004), urethritis being one of the symptoms (Tiitinen 2012a). Urinary symptoms manifest also as burning sensation (Bakken et al. 2007; Hanhiova 2012b; Ylikangas 2011) or itching during urination (Ylikangas 2011). Penile discharge (Bakken et al. 2007), which can be light greyish (Hanhiova 2012b; Hiltunen-Back 2009a) or of watery/mucous consistency (Ylikangas 2011), might occur. Epididymitis can also be associated with chlamydia trachomatis infection (Hanhiova 2012b; Tiitinen 2012a), as well as reactive arthritis (Hanhiova 2012b). In both females and males, chlamydia trachomatis may be transmitted to the pharynx. In this case, non-specific upper respiratory tract symptoms can occur (Karlsson, Österlund & Forssén 2011).

5.2 Symptoms of genital herpes

Primary herpes infection can be either symptomatic (Hiltunen-Back 2009b) or asymptomatic (Hiltunen-Back 2009b; Tiitinen 2012b). The infection may cause several systemic symptoms (Hanhiova, 2012a; Hiltunen-Back 2009b; Horowitz, Aierstuck, Williams & Melby 2011; Tiitinen 2012b) such as fever, muscle pains and headaches (Hanhiova, 2012a; Hiltunen-Back 2009b; Horowitz et al. 2011).

A symptomatic primary infection can be painful (Hannuksela 2012b; Horowitz, et al. 2011; Richards, Krantz, Selke & Wald 2008) and accompanied with severe symptoms (Hannuksela 2012b; Tiitinen 2012b). Primary infection manifests on both men and women as painful lesions or blisters in the genital area (Hanhiova 2012a; Hannuksela

2012b; Horowitz et al. 2011; Tiitinen 2012b). The blisters occur bilaterally surrounding the genital area, in men more commonly around glans (Hanhirova 2012a). Blisters may also appear on genital mucosae, thighs and inter-gluteal cleft (Hannuksela 2012b). These blisters will eventually ulcerate after erupting and start to form a scab (Hanhirova 2012a; Hannuksela 2012b; Hiltunen-Back 2009b; Tiitinen 2012b).

Adenitis is a symptom of herpes on both sexes (Hanhirova 2012a; Hiltunen-Back 2009b; Horowitz et al. 2011). Urinary symptoms caused by herpes include dysuria (Horowitz et al. 2011; Tiitinen 2012b). In addition, sterile pyuria, urinary retention and urge incontinence can occur in women (Horowitz et al. 2011). They might suffer from itching and burning sensation in vulva (Tiitinen 2012b) and from back pain (Horowitz et al. 2011). In men urethral discharge may occur (Horowitz et al. 2011).

The virus will stay dormant in the host (Hiltunen-Back 2009b), but remains to be contagious even when being asymptomatic (Hanhirova 2012a). Recurrent infections are usually shorter in length as they heal faster and the symptoms are milder than in primary infection (Hanhirova 2012a; Hiltunen-Back 2009b). The recurrent infection manifests as one or more unilateral blisters in the genital area (Hanhirova 2012a; Tiitinen 2012b). The recurrence rate of genital herpes is around 80%, and systemic symptoms at this stage are rare (Tiitinen 2012b).

5.3 Symptoms of genital warts/condyloma

According to studies conducted by Winer et al. (2005) and Arima et al. (2010), HPV-6 or HPV-11 infections are the main HPV types causing genital warts in both women and men. Hannuksela (2012a) states that genital warts can recur easily. In men, there are usually one to fifteen wart lesions in an infection of genital warts (Arima et al. 2010). The warts can appear as clear, pink small growth, which might form large clusters. There also might be wart like, dark growth in the shaft of penis. (Hannuksela 2012a.) Genital warts can grow on the pubis, on the shaft, on the base of the shaft, on the meatus, on the scrotum and on the crural fold (Arima et al. 2010). Hannuksela (2012a) states that genital warts can, in addition, occur in the glans, testicles, perianal area, in the inter-gluteal cleft and in the urethra, where they can cause dysuria.

In women, symptoms of HPV-6 or HPV-11 infections are warts in the perineal and perianal area, in the vagina, in the vulva and in the cervix (Hannuksela 2012a; Winer et al.

2005). Tiitinen (2013) explains that apart from wart like growth in the vulva and cauliflower like genital warts and cell changes in the cervix there can also exist flat lesions in the vagina and cervix. However, women often have HPV infections without experiencing any symptoms (Mao et al. 2003; Tiitinen 2013).

5.4 Prevention of chlamydia trachomatis, genital herpes, genital warts/condyloma

In general, there is a large unawareness of the chronic nature of many STIs and that several STIs cannot be cured (Royer & Zahner 2009). There exist a number of misconceptions about safe sex. In a research conducted by Wolfers et al. (2011), almost half of participants assumed that washing after sex is a mean of prevention against STI and 38% thought that oral contraceptives protect against STIs. One third of the participants were not aware of the risks of anal and oral sex. Oral sex is not perceived as a transmission route of STIs (Royer & Zahner 2009).

STIs can be transmitted in unprotected intercourse. Sex where body fluids such as semen, vaginal discharge, blood and urine do not enter or penetrate the partner's body, mucous membranes or wounds is considered to be safe sex. (Hanhirova 2012c.) Condoms prevent transmission of STIs (Hanhirova 2012c; Hannuksela 2012a; Horowitz et al. 2011; Miksis 2008; Tiitinen 2012b) when used correctly (Hanhirova 2012c; Miksis 2008). Attention needs to be paid on the facts that condoms have an expiry date and are single-use items. Birth control pills, spermicidal foams and suppositories do not protect from STIs. (Hanhirova 2012c.) It is advised to use a condom particularly with casual sex partners (Hannuksela 2012a; Tiitinen 2012b) as condoms are the only way to protect oneself from STIs and other sexually transmitted diseases (Hanhirova 2012c).

STIs can be transmitted to a person's throat in unprotected oral sex (Hanhirova 2012c) and it is therefore suggested to use this barrier method also when engaging in oral sex (Horowitz et al. 2011). In anal intercourse the risk of mucous membrane damage is higher than in vaginal intercourse and infections are transmitted more easily. It is important to use a thicker condom with water based lubricant in anal intercourse. (Hanhirova 2012c.)

Chlamydia trachomatis is transmitted via unprotected sex (Hiltunen-Back 2009a; Sayegh, Fortenberry, Anderson & Orr 2005) which includes also oral sex (Hiltunen-

Back 2009a; Karlsson et al. 2011). Chlamydia infection can be avoided by using a condom in sexual activity (Bakken et al. 2007; Hiltunen-Back 2009a; Sayegh et al. 2005; Tiitinen 2012a).

There still remains a misbelief that condoms protect from all STIs (Royer & Zahner 2009). However, there is no evidence that condom use protects against condyloma (Hannuksela 2012a) as condoms provide only partial protection against the transmission of the papilloma virus (Tiitinen 2013). Miksis (2008) found out that condoms in combination with vaccination provide the best protection against HPV transmission, although her results state that there still remains variability in condom protection of HPV infection from 0% to 80%.

Genital herpes is transmitted via intercourse and oral sex (Hanhiova 2012a; Hiltunen-Back 2009b). Oral herpes can be transmitted to the genital area during oral sex (Hiltunen-Back 2009b). Condom use and refraining from sex during the active phase of herpes decrease the risk of transmission (Hannuksela 2012b; Hiltunen-Back 2009b). As asymptomatic herpes virus is contagious, it is recommended to always use condoms (Hannuksela 2012b) since half of the transmissions occur during the inactive phase or through a partner who is not aware of his/her infection (Tiitinen 2012b).

During an outbreak, the herpes virus is exceptionally contagious. Condom use is recommended always during an outbreak even when being in a stable relationship. (Tiitinen 2012b.) The virus cannot be transmitted through a condom (Hannuksela 2012b). However, a condom does not fully protect a person from transmission of herpes virus (Tiitinen 2012b) because if the cluster of blisters is outside of the area covered by the condom transmission is possible (Hiltunen-Back 2009b).

6 Discussion

6.1 Discussion of results

The results of different reviewed articles showed that among patients experiencing chlamydia trachomatis, genital herpes or genital warts/condyloma there might be no symptoms, few symptoms or many symptoms. There also exists variation in the re-

searched articles about the number of symptoms attributed to each of the researched infections. The symptoms that were discussed to be the most common ones for these infections were not identical in all reviewed articles. However, the findings on symptoms of these STIs show consistency and similar tendency.

The results of this thesis show that chlamydia trachomatis, genital herpes and genital warts/condyloma are often asymptomatic (Bakken et al 2007; Chen, Rohrsheim & Donovan 2005; Cole & Jasiak 2004; Hanhirova 2012b; Hiltunen-Back 2009a; Hiltunen-Back 2009b; Mao et al. 2003; Tiitinen 2012a; Tiitinen 2012b; Tiitinen 2013; Ylikangas 2011). In addition, many of the symptoms of chlamydia trachomatis, genital herpes and genital warts/condyloma are not specific to STIs or to a particular STI (Hanhirova 2012c). This may lead to a situation when a carrier of an STI does not recognize the need for testing and to further cases of transmission.

When being sexually active, the most effective means of prevention from STIs is the use of condoms (Hanhirova 2012c; Hannuksela 2012a; Horowitz et al. 2011; Miksis 2008; Tiitinen 2012b). It remains to be a safe, economic, uncomplicated and easily attainable method of preventing the majority of STIs. However, genital herpes and genital warts/condyloma can still be transmitted outside the protected area as condoms only protect the area which they cover (Hiltunen-Back 2009b). There exists an effective vaccine against HPV (Miksis 2008), but it does not protect against any other STIs. Abstinence of sexual activity is a secure way of preventing STIs, but is not promoted in Finland and was, therefore, not mentioned in Finnish sources or in this thesis.

Oral sex is a route of transmission of chlamydia trachomatis, genital herpes and genital warts/condyloma (Karlsson, Österlund & Forssén 2011; Hanhirova 2012c; Hanhirova 2012a; Hiltunen-Back 2009b). According to Finnish sources, a condom is the best means of prevention of oral transmission route (Hanhirova 2012c; Hannuksela 2012a; Horowitz et al. 2011; Miksis 2008; Tiitinen 2012b). Surprisingly, Finnish research emphasizes this fact more than international research.

6.2 Discussion of validity

When evaluating the validity of a research it is of great importance to evaluate each phase of the conducted research separately: the data collection, data analysis and reporting of the data. Answers on the study question should be derived from the research

data. Data collection should be complete and the collected data should be representative and reliable. Inclusion and exclusion criteria of the research must be clearly stated. It is in the nature of qualitative research that interpretation of the data is to some extent influenced by the views, opinions and intuition of the researcher. This is why researchers should not make assumptions that are not derived from the data. In qualitative studies, data is analysed by creating justified categories and subcategories. In order to justify interpretations, the researcher should give sufficient authentic examples and not merely paraphrase the results. The research should provide new insights into a phenomenon. The process of analysis should be documented clearly and in enough detail. This enables the reader to understand and evaluate conclusions of the research. (Paunonen & Vehviläinen-Julkunen 1998: 215- 220.)

In this thesis, validity was achieved by following the ideas about valid research process provided by Paunonen and Vehviläinen-Julkunen (1998). Regular revision of the written text as well as dialogue and discussion on the work process of three co-authors were applied in attempt to ensure a high level of objectivity and decreased possible bias. The work process of this thesis was conducted systematically following the phases of a literature review and principles of content analysis throughout the process of data search and data analysis, while applying clear inclusion and exclusion criteria. Results of the literature review answered the study questions of this thesis.

Professional and reliable databases, CINAHL, Ovid Nursing Database and Terveystieto, were used during the process of literature search. CINAHL provides a highly respected and vast source of information for the health care sector. Information obtained from the databases serves professionals, educators as well as students of the field. (CINAHL 2013.) Ovid offers important medical information for health care professionals. The widely used market-leading online search and discovery platform supports improved critical decision making and patient care while simultaneously providing valuable sources for researchers. Reliable and current information can in a quick and efficient manner be found from a large pool of content and data. The aim of Ovid is on improving research productivity. (Ovid 2013.) Over 400 international journals and periodicals in Ovid Nursing Database are provided by Journals@Ovid and MEDLINE as well as by the United States National Library of Medicine's (NLM®) premier bibliographic database. Ovid Nursing Database is a reliable database, as it provides relevant information for practice, education, research, and administration in nursing. (Ovid Nursing 2013.) Terveystieto is an internet service for health care professionals in Finland

for which the user has to pay. It provides well researched information on a plethora of topics related to human health in Finnish language in a centralized place. Information is provided to Terveystietä by Duodecim's vast organization of experts and partners. (Terveystietä 2013.)

6.3 Discussion of ethics

Ethical guidelines must be followed when conducting research and when writing about the research according to scientific criteria. Being nonbiased and open towards unexpected results is of great importance. This applies for the process of data collection, the research itself and for the analysis methods. Credit should be given to achievements of previous research in all cases of quotations, paraphrasing and references. Accuracy and truthfulness are to be respected. (Academy of Finland 2012.) These ethical issues were considered throughout the work process of this thesis. As the end product is a literature review it is of great importance to give credit to previous research in an ethical manner. Data base search was conducted in a professional, unbiased and academic manner with clear inclusion - and exclusion criteria of previous research.

6.4 Conclusion

Chlamydia trachomatis, genital herpes and genital warts/condyloma are the most prevalent STIs among Finnish adolescents. According to research, they also lack knowledge on the fact that STIs can be asymptomatic. It should be taught to the adolescents that STIs spread even when no symptoms are present. Another finding that should be stressed in sexual health education is the importance of practicing safe sex. Safe sex includes the correct use of a condom, also during anal and oral sex.

Complications of chlamydia trachomatis, genital herpes and genital warts/condyloma are not discussed in this thesis. Nevertheless, complications such as e.g. infertility caused by chlamydia trachomatis should be emphasized in holistic sexual health education. Adolescents should understand that chlamydia trachomatis can cause irreparable damage, e.g. to reproductive organs, especially in females. Other lifelong consequences of STIs are the potential of HPV to develop into cervical cancer and the incurability of virus infections, as e.g. the herpes virus. In the year 2013 the HPV vaccination was introduced into the Finnish national vaccination programme. This is likely to have

an impact on the prevalence of HPV infection and related development of cancer in the future.

The results gained from this literature review synthesize contemporary scientific knowledge on symptoms and prevention of chlamydia trachomatis, genital herpes and genital warts/condyloma. However, in the future additional research is required on STIs and adolescents. The STIs which are not discussed in this thesis and different variables such as social, behavioural and environmental aspects, transmission routes of infections, aetiology, diagnosis and treatment of STIs can in the future be researched further.

7 Knowledge test and suggestions for further research

In this thesis a literature review on the symptoms and prevention of chlamydia trachomatis, genital herpes and genital warts/condyloma was conducted. The results of this literature review can serve as a base for a knowledge test for adolescents about these STIs.

When creating a knowledge test it is important to develop test objectives as suggested in the article by Jaworski and Carey (2007). Test objectives and items for the knowledge test can be derived from the results.

It is recommended to develop the knowledge test in the format of alternative choice answers, e.g. true/false/I don't know. Items should be written as present tense declarative statements as advocated by Jaworski and Carey (2007.) Adding the option "I don't know" reduces the likelihood of guessing in the test participants (Sullivan & Dunton 2004). Negatives or items that contain universals, as e.g. always, never, as well as complex structure of phrases and difficult terminology should be avoided (Jaworski & Carey 2007). In the knowledge test the items should be formed to be difficult enough in order to create differences among the participants (Jaworski & Carey 2007; Kontula & Meriläinen 2007: 27). Furthermore, items should be formulated to be free from attitudes, emotions and experiences of the adolescents (Kontula & Meriläinen 2007: 27). The knowledge test could consist of approximately 10 to 15 items about both symptoms and prevention of chlamydia trachomatis, genital herpes and genital warts/condyloma.

The knowledge test could be reviewed by experts for validity and a pilot study would need to be conducted before using it. The knowledge test could be used in nursing science as a tool to collect data for further research about the sexual health among young people in Finland. In addition, nurses could use the knowledge test to improve sexual health education.

The knowledge test can be used to find out the level of knowledge of upper secondary school students about STIs after receiving sexual health education. Based on the results of the knowledge test teachers can reflect on the level of knowledge the students have about STIs. In this way it might become more obvious what has remained unclear to the students and the content of the sexual health education can be developed and improved. The not yet piloted "Knowledge Test about Sexually Transmitted Infections for Adolescents" is not published in this thesis due to copyright reasons.

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Articles (n=14) analysed in the review from Ovid Nursing Database and CINAHL Databases

Table 1. Articles (n=14) analysed in the review from Ovid Nursing Database and CINAHL Databases

Author(s), year, country where the study was conducted	Title of the article	Purpose	Participants (sample size)	Data collection and analysis	Results relevant for our study questions
Symptoms					
Arima, Y., Winer, R., Feng, Q., Hughes, J., Lee, S., Stern, M., O'Reilly, S. and Koutsky, L. (2010). Journal of Infectious Diseases, 202 (8), 1181-1184. USA.	Development of genital warts after incident detection of human papillomavirus infection in young men.	The cumulative incidence of genital warts following incident detection of specific HPV types and (2) the time between the first detection of HPV infection and genital warts among those who developed warts.	(473) 418 18–21-year-old male students.	A cohort study with triannual genital examinations.	<ul style="list-style-type: none"> - Among these 22 men, 96 individual wart lesions were found at the time of diagnosis (median, 3 lesions; range, 1–15 lesions). Thirty-four wart lesions were found on the pubis (15 lesions in a single individual), 33 on the shaft, 22 on the base of the shaft, 4 on the meatus (all 4 lesions in a single individual), 2 on the scrotum, and 1 on the crural fold. p.1183. - Compared with that for our female cohort, the median time between incident HPV-6 or HPV-11 infection and the detection of warts among those who developed warts was ~3-fold longer for the male cohort: ~11 months. - Our results suggest that genital warts are common after HPV-6 or HPV-11 infection in young men. - HPV-6 infection was more common than HPV-11 infection.
Bakken, I., Skjeldestad F., Halvorsen T., Thomassen T., Størvold G. and Nordbø S. (2007). Sexually Transmitted	Chlamydia trachomatis among Young Norwegian men: Sexual Behaviour and Genitourinary Symptoms.	Assessment of chlamydia trachomatis' prevalence, risk factors for infection, and genitourinary symptoms among sexually	1032 males, 18 to 30 years old, recruited from student health services and from university campuses in 2	Cross sectional study, questionnaire for participants on sexual behaviour and lab tests.	<ul style="list-style-type: none"> - Burning sensation on urination and penile discharge in many men with ct. - Genitourinary symptoms related to ct positivity (penile discharge and burning sensation during urination, but majority of ct positive men had no symptoms. - ≥5 lifetime sexual partners.

Diseases, 34 (4), 245-249. Norway.		active young men.	cities.		
Chen, M., Rohrsheim, R. and Donovan, B. (2005). Australian and New Zealand Journal of Obstetrics and Gynaecology, 45, 410-413. Australia.	Chlamydia trachomatis infection in Sydney women.	To help guide chlamydia testing of women, to establish factors predictive of chlamydial infections in austral. Clinical setting.	170 ct positive women without concurrent urogenital infections from sexual health service in Sydney.	Clinician interview, statistical analysis.	<ul style="list-style-type: none"> - Women are asymptomatic, but also mentioned in free text. - Although they were present in only a minority of infected women, symptoms of dysuria and post-coital bleeding were each independently associated with chlamydia. - Clinical syndromes that are linked to C. trachomatis, such as cervicitis and pelvic inflammatory disease.
Cole, R. and Jasiak, S. (2004). Australian Journal of Advanced Nursing, 22 (2), 19-24. Australia.	What do you get when you fall in love?: Warehouse Youth Health Centre Chlamydia Audit.	Aim: to determine the rate of positive diagnosis of ct in young people 12-25 years, and review of current practice of ct testing.	194 (179 females, 15 males). Young people 12-25 years at warehouse youth health centre, Sydney.	Literature review. Retrospective study on medical records, descriptive analysis.	<ul style="list-style-type: none"> - Three main symptoms in females: vaginal discharge, dyspareunia and post-coital bleeding, males are more likely to be asymptomatic. - Other symptoms with more than 5% reported incidence include; inter-menstrual bleeding, abdominal pain, urinary symptoms, dysmenorrhea and irregular bleeding. - Males reported predominantly urinary symptoms (20%). - Of females, 32% were asymptomatic whereas 60% of the males were asymptomatic.
Horowitz, R., Aierstuck, S., Williams, E., and Melby, B. (2011). Journal of American College Health, 59 (2), 69-74. USA.	Herpes Simplex Virus Infection in a University Health Population: Clinical Manifestations, Epidemiology, and Implications.	Description of epidemiology, clinical presentations or oral and genital herpes simplex virus in a university health population and implications of those findings.	215 patient records (80, 5% of those are 18-24 years) patients symptomatic culture positive HSV infection, Health service of University in Massachusetts.	Review of 215 patient records, lab specimens, and statistical analysis.	<ul style="list-style-type: none"> - In addition to typical papulopustular, vesicular ulcerative and crusted lesions also dysuria, sterile pyuria and back pain in females (71), males also pain and no lesions, also urethral discharge. - AFI was present in 17.1% of females, and 10.5% of male who had HSV-1 genital infection. AFI was present in 22.2% of females, but no men with HSV-2 genital infection. - Both urinary retention and urge incontinence were seen with sacral autonomic dysfunction. - Pain, systemic symptoms, adenitis, dysuria, and pyuria antedated by 1 or more days the development of genital lesions for women with less typical clinical presentations of both HSV-1/HSV-2 genital infections.

					<ul style="list-style-type: none"> - HSV-2 was found in 7.2% of symptomatic patients with oral herpes (OH). - HSV-1 was identified in 71.2% of GH infections across all age groups.
<p>Karlsson, A., Österlund, A., and Forssén, A. (2011). Scandinavian Journal of Infectious Diseases. 43, 344-348. Sweden.</p>	<p>Pharyngeal Chlamydia trachomatis is not uncommon any more.</p>	<p>Should Ph-Ct be considered as a differential diagnosis when prolonged pharyngeal discomfort. Aim: find answers on: 1. does Ct infection constitute a differential diagnosis in young persons with prolonged throat discomfort? What are the symptoms if any? 2. How common is Ph-Ct infection in young persons with genital Ct, and does the prevalence differ between women and men?</p>	<p>Substudy 1: 48 persons 15-35 years with pharyngeal discomfort. Substudy 2: 150 people, 15-35 years with genital ct.</p>	<p>Descriptive study, Questionnaires, samples for ct testing, statistical analysis.</p>	<ul style="list-style-type: none"> - URT symptoms in people with Ph-Ct. - These symptoms could, however, not be specified.
<p>Mao, C., Hughes, J., Kiviat, N., Kuypers, J., Lee, S., Adam D., and Koutsky L.</p>	<p>Clinical findings among young women with genital human papillomavirus infection.</p>	<p>To identify clinical signs and symptoms associated with detection of HPV-DNA in the fe-</p>	<p>516 University of Washington, students (18-24 years old.</p>	<p>Cohort study, interviews at every visit, with a questionnaire collection of genital speci-</p>	<ul style="list-style-type: none"> - Vaginal discharge, itching and pain and dyspareunia are NOT symptoms of HPV not even in 6 and 11. - HPV (6 and 11): genital lesions and genital warts, majority of infections asymptomatic. - Most HPV infections are asymptomatic and clinically unremarkable, concludes that most women with HPV in-

(2003). American Journal of Obstetrics and Gynecology, 188 (3), 677-684. USA.		male genital tract		mens, testing every 4 months, multivariate (statistical) analysis.	fection are asymptomatic.
Miksis, S. (2008). Journal of Obstetric, Gynecologic & Neonatal Nursing, 37, 329-337. USA.	A Review of the Evidence Comparing the Human Papillomavirus Vaccine Versus Condoms in the Prevention of Human Papillomavirus Infections.	To examine the evidence related to the efficacy of condom use versus the human papillomavirus vaccine in the prevention of human papillomavirus infections.	Amount of articles that were reviewed is not mentioned.	Review of literature.	- Majority of HPV infections are asymptomatic.
Richards, J., Krantz, E., Selke, S. and Wald, A. (2008). Sexually Transmitted Diseases. 35 (12), 1015-1021. USA.	Healthcare seeking and sexual behavior among patients with symptomatic newly acquired genital herpes.	To describe the healthcare seeking and sexual behaviour in a group of patients with symptomatic laboratory confirmed first episode HSV infection.	236 (94males, 142 females) patients with newly acquired genital herpes, age: 14 and older, STD clinic of University in Washington.	Demographic and sexual history standardized questionnaire, laboratory testing and statistical analysis.	- Females: pain, males: lesions, many (1/3) have sex after symptoms start, even after diagnosis (males and females), females reported pain; males reported lesions as the most frequent and bothersome symptom causing seeking of healthcare.
Royer, H. and Zahner, S. (2009). Public Health Nursing. 26 (2), 161-72. USA.	Providers' Experiences with Young People's Cognitive Representations and Emotions Related to the Prevention and Treatment of Sexually Transmitted Infections.	To examine providers' experiences with young people cognitive representations and emotions related to the prevention and treatment of	30 providers of STI education, PHN and clinic based nurse practitioners.	Qualitative investigation using semi-structured focus group interviews, use of CSM(common sense model)	- Unawareness of asymptomatic cases, partner looked ok, symptom free, lack of awareness.

		STIs, development of enhancing effectiveness of STI education.		as conceptual framework, exploratory and descriptive study.	
Winer, R., Kiviat, N., Hughes, J., Adam, D., Lee, S., Kuypers, J. and Koutsky, L. (2005). The Journal of Infectious Diseases, 191 (5), 731-738. USA.	Development and Duration of Human Papillomavirus Lesions, after Initial Infection.	To determine the potential value of HPV vaccines, information concerning the incidence and durations of clinically important lesions is needed.	603 female university students, 18- 20 years, Washington.	Methods of recruitment and data collection are described elsewhere, longitudinal study (38, 8 months, sounds like questionnaire (demographic, medical and sexual history information) and statistical analysis, gynaecologic examinations with lab tests, SILS referred to colposcopy.	<ul style="list-style-type: none"> - Genital warts incidence is high when HPV 6 or HPV11 (66%). - Genital warts develop quickly after infection with HPV infection. - Of 31 women developing clinically ascertained genital warts after incident HPV infection (2 women had cervical warts, 1 woman had vaginal warts, and 28 women had vulvar, perineal, or perianal warts), 83.9% were positive for HPV-6 or HPV-11.
Wolfers M., de Zwart, O. and Kok, G. (2011). AIDS Patient Care STDs, 25 (5), 311-319. Netherlands.	Adolescents in The Netherlands Underestimate Risk for Sexually Transmitted Infections and Deny the Need for Sexually Transmitted Infection Testing.	The aim of this study was to examine risk perceptions in relation to STI testing among lower-educated adolescents in order to inform the development of interventions	Two independent samples of 16–25 year old vocational school students (n = 756/ n = 1302).	2 cross-sectional surveys, questionnaire, analyses were conducted using SPSS.	<ul style="list-style-type: none"> - No physical complaints as a reason not to test. - 38% did not know that STI could cause infertility in women. -The incorrect perception that an STI is always accompanied by physical complaints was held by a third of the participants.

		promoting STI testing.			
Prevention					
Author(s), year, country where the study was conducted	Title of the article	Purpose	Participants (sample size)	Data collection and analysis	Results relevant for our study questions
Bakken , I., Skjeldestad F., Halvorsen, T., Thomassen, T., Størvold G. and Nordbø, S. (2007). Sexually Transmitted Diseases, 34 (4), 245-249. Norway.	Chlamydia trachomatis Among Young Norwegian Men: Sexual Behavior and Genitourinary Symptoms.	Assessment of chlamydia trachomatis' prevalence, risk factors for infection, and genitourinary symptoms among sexually active young men.	1032 males, 18 to 30 years old, recruited from student health services and from university campuses in 2 cities.	Cross sectional study, questionnaire for participants on sexual behaviour and lab tests.	- Consistent use of condoms and with new partners protects from CT.
Horowitz, R., Aierstuck, S., Williams, E. and Melby, B. (2011). Journal of American College Health, 59 (2), 69-74. USA.	Herpes Simplex Virus Infection in a University Health Population: Clinical Manifestations, Epidemiology, and Implications.	Description of epidemiology, clinical presentations or oral and genital herpes simplex virus in a university health population and implications of those findings.	215 patient records (80, 5% of those are 18-24years) patients symptomatic culture positive HSV infection, Health service of University in Massachusetts.	Review of 215 patient records, lab specimens, and statistical analysis.	- Suggested to use barrier methods for oral and genital sex.
Karlsson, A., Österlund, A.	Pharyngeal Chlamydia trachomatis is	Should PhCt be considered as a	Substudy 1: 48 persons 15-35	Descriptive study, Ques-	- Ph- CT is not uncommon in genitally infected sexually active people.

and Forssén, A. (2011). Scandinavian Journal of Infectious Diseases. 43 (5), 344-348. Sweden.	not uncommon any more.	differential diagnosis when prolonged pharyngeal discomfort. Aim: find answers on: 1. does Ct infection constitute a differential diagnosis in young persons with prolonged throat discomfort? What are the symptoms if any? 2. How common is Ph-Ct infection in young persons with genital Ct, and does the prevalence differ between women and men?	years with pharyngeal discomfort. substudy 2: 150 people, 15-35 years with genital ct.	tionnaires, samples for ct testing, statistical analysis.	- Public information on STIs should highlight the risk of contracting Ct infections by practicing oral sex.
Miksis, S. (2008). Journal of Obstetric, Gynecologic & Neonatal Nursing, 37, 329-337. USA.	A Review of the Evidence Comparing the Human Papillomavirus Vaccine Versus Condoms in the Prevention of Human Papillomavirus Infections.	To examine the evidence related to the efficacy of condom use versus the human papillomavirus vaccine in the prevention of human papillomavirus infections.	Amount of articles that were reviewed is not mentioned.	Review of literature.	<ul style="list-style-type: none"> - Condoms provide protections against most STIs when used correctly, some studies say that condom protects from genital warts. - Protection from vaccine more consistent, but condom may protect from some HPV transmissions. - Condoms in combination with vaccine the greatest protection, but also against other STIs. - Lower the risk for genital warts, high-grade dysplasia, and invasive cervical cancer variability in condom protection of HPV infection from 0% to 80%.
Royer, H. and Zahner, S.	Providers' Experiences with Young	To examine providers expe-	30 providers of STI education,	Qualitative investigation us-	<ul style="list-style-type: none"> - Transmission via mouth. - Inaccurate believe that condoms protect you from every-

(2009). Public Health Nursing, 26 (2), 161-72. USA.	People's Cognitive Representations and Emotions Related to the Prevention and Treatment of Sexually Transmitted Infections.	periences with young people cognitive representations and emotions related to the prevention and treatment of STIs, development of enhancing effectiveness of STI education	PHN and clinic based nurse practitioners.	ing semi -structured focus group interviews, use of CSM(common sense model) as conceptual framework, exploratory and descriptive study.	thing, believe in unlikely sources, toilet seats etc., inaccurate belief, that after treatment no reinfection is possible, no transmission via oral sex. - Unaware that some STIs are incurable and chronic in nature.
Sayegh, M., Fortenberry, J., Anderson, J., and Orr, D. (2005). Journal of Adolescent Health, 37 (2), 163.e1-163.e7. USA.	Relationship quality, coital frequency and condom use as predictors of incident genital Chlamydia trachomatis infection among adolescent women.	to explore associations of relationship quality, coital frequency, unprotected coitus and chlamydia infection over time.	142 adolescent females with STIs from three primary care adolescent clinics and on one county STD clinic, USA.	Analyses were conducted using structural equation modelling. Interview data were collected at 3 time points: enrolment, 1 month, and 3 months after enrolment. Interview data, structured interviews, statistical analysis.	- Unprotected coitus associated with increased risk of chlamydia infection if no condom used. - New partner into sex network increases risk of STI infections, condoms prevent chlamydia.
Shafii T., Stovei, K. and Holmes, K. (2007). American Journal of Public Health. 97 (6), 1090-1095. USA.	Association between condom use at sexual debut and subsequent sexual trajectories: a longitudinal study using biomarkers.	Comparison of subsequent sexual behaviours and risk of sexually transmitted infections among adolescents who did and did not use a condom at	4018 sexually active adolescents and young adults, from schools around the country of USA.	Observational, longitudinal study: three waves sample collection, comprehensive in home interviews; computer assisted self-	- Condom use on sex debut half as likely to test positive for gonorrhoea or chlamydia, as subsequent use of condom more likely. - Early condom users practice safer sex later and less likely to have an STI.

		their sexual debut.		interview techniques, linear regression equations.	
Wolfers M., de Zwart, O. and Kok, G. (2011). AIDS Patient Care STDs, 25 (5), 311-319. Netherlands.	Adolescents in The Netherlands Underestimate Risk for Sexually Transmitted Infections and Deny the Need for Sexually Transmitted Infection Testing.	The aim of this study was to examine risk perceptions in relation to STI testing among lower-educated adolescents in order to inform the development of interventions promoting STI testing.	Two independent samples of 16–25 year old vocational school students (n = 756/ n = 1302).	2 cross-sectional surveys, questionnaire, analyses were conducted using SPSS.	<ul style="list-style-type: none"> - One third was unaware of the risks of anal and oral sex. - 44% thought that washing after sex would prevent STI. - 38% thought that oral contraceptives protect against STI.

Articles (n=11) analysed in the review from Terveysportti

Table 1. Articles (n=11) analysed in the review from Terveysportti

Symptoms		
Framework for Data Analysis on Authors	Title	Results relevant for our study questions, Symptoms
Hanhirova, M. (2012a) Finland, Terveysportti	Sairaanhoidajan käsikirja: Genitaalierpes	<ul style="list-style-type: none"> - Asymptomatic herpes virus is contagious. - Primary infection: several painful lesions of blisters bilaterally surrounding the genital area (in men more commonly around glans), swollen lymph nodes in groin, after blister phase painful ulcers and scabs. - Systemic symptoms: fever, muscle pains, headache. - Recurrent infection: symptoms milder, often unilateral blisters or a single ulcer in the genital area, Infection heals faster than primary infection.
Hanhirova, M. (2012b) Finland, Terveysportti	Sairaanhoidajan käsikirja: klamydia	<ul style="list-style-type: none"> - Most infections are asymptomatic. - Symptoms in women: unusual vaginal discharge, dysuria, frequent urination, postcoital bleeding, irregular menstruation, pain in abdomen or back, symptoms of pelvic inflammation (asymptomatic/severe symptoms). - Symptoms in men: dysuria, light greyish discharge from urethra, epididymitis, reactive arthritis.
Hanhirova, M. (2012c) Finland, Terveysportti	Sairaanhoidajan käsikirja: Sukupuolitautilpotilaan ohjaus	<ul style="list-style-type: none"> - Systemic symptoms: fever, headache, sore throat, muscle and joint pain, swelling of lymph nodes particularly in groins. - Local symptoms: oral and genital ulcers, warts and blisters, itch, burn, increased vaginal discharge, abdominal and lower back pain, pelvic inflammatory disease, frequent urination, dysuria, mucopurulent discharge from urethra, epididymitis, ulcers, itch or warts in rectum and perineal area.
Hannuksela, M. (2012a) Finland, Terveysportti	Tietoa potilaalle: kondylooma, eli visvasyyliä	<ul style="list-style-type: none"> - In men the majority of warts appear as clear pink small growth in glans, shaft of penis, testicles, perianal area and between buttocks, might form large clusters. - Often wart like, dark growth in the shaft of penis, also in the urethra causing dysuria. - In women: in labia, vagina, perineal area and between buttocks. - Genital warts recur easily.
Hannuksela, M. (2012b) Finland, Terveysportti	Tietoa potilaalle: Sukuelinherpes (genitaalierpes) miehellä	<ul style="list-style-type: none"> - A cluster of painful blisters filled with clear fluid which eventually erupt. - Can be extremely painful with severe symptoms. - Blisters appear on genital mucosae, thighs and buttocks.

Hiltunen-Back, E. (2009a) Finland, Terveysportti	Sairauksien ehkäisy: Klamydia	Women: - Often either mild or no symptoms. - Dysuria, abdominal pain, increased vaginal discharge, abnormal vaginal bleeding. Men: - Greyish discharge from urethra.
Hiltunen-Back, E. (2009b) Finland, Terveysportti	Sairauksien ehkäisy: Sukuelinherpes	- Primary infection can be symptomatic or asymptomatic. - The virus will stay dormant in the host. - Recurring episodes are usually shorter and milder than the primary infection. - Blisters in the genital area ulcerate after erupting. - The patient might have systemic symptoms and local swollen lymph nodes.
Tiitinen, A. (2012a) Finland, Terveysportti	Tietoa potilaalle: klamydia	Women: - Commonly manifests as cervicitis. - Symptoms: abnormal vaginal discharge, dysuria, irregular bleeding. - If the chlamydia infection has spread to endometrium, abdominal pain and irregular menstrual bleeding may occur. Men: - Symptoms: urethritis, epididymitis. - Complication in women: infertility. - At least 90 % of women are asymptomatic, men 50 %. - One in four men and majority of women do not notice any specific first symptoms of chlamydia and many of them remains as asymptomatic carriers.
Tiitinen, A. (2012b) Finland, Terveysportti	Tietoa potilaalle: Sukuelinherpes (genitaalierpes) naisella	- Itching and burning in vulva, blisters in genital area. - The blisters will ulcerate and form a scab. - Primary infection is more severe, often dysuria. - Systemic symptoms: fever, headaches, muscle aches. - Symptoms last 2-3 weeks. - Primary infection may also be asymptomatic. - Recurrent infection: Often unilateral blisters/ulcers in the genital area, systemic symptoms are rare. - The recurrence rate of genital herpes is about 80%.
Tiitinen, A. (2013) Finland, Terveysportti	Tietoa potilaalle: Papilloomavirus naisella	- Cauliflower like genital warts and/or mild or severe cell changes in the cervix. - Wart like growth in vulva, flat lesions in vagina and cervix. - HPV-infection is often asymptomatic.
Ylikangas, R. (2011) Finland, Terveysportti	Sh:n vastaanoton ohjeet: Klamydiatulehduksen hoito	- Often completely asymptomatic. - Women might suffer from abdominal/lower back pains; have abnormal vaginal discharge, bleeding after intercourse or frequent urination.

		- Men might have watery discharge that later becomes mucous, also itching and burning during urination.
Prevention		
Framework for Data Analysis on Authors	Title	Results relevant for our study questions, Prevention
Hanhirova, M. (2012a), Finland, Terveysportti	Sairaanhoidajan käsikirja: genitaalierpes	- Genital herpes is the most common cause for genital ulcers. - It is transmitted via intercourse and oral sex.
Hanhirova, M. (2012c) Finland, Terveysportti	Sairaanhoidajan käsikirja: Sukupuolitautilipolitoalan ohjaus	- STIs can be transmitted in unprotected intercourse. - STIs can be transmitted to throat in unprotected oral sex. - In safe sex body fluids such as semen, vaginal discharge, blood and urine do not enter or penetrate partner's body, mucous membranes or wounds. - The right use of condom is important and the only way to protect oneself from STIs and other sexually transmitted diseases. - Condoms have an expiry date and are single-use. - Birth control pills, spermicidal foams and suppositories do not protect from STIs . - In anal intercourse the risk of mucous membrane damage is higher and infections are transmitted more easily. - It is important to use a thicker condom and water based lubricant.
Hannuksela, M. (2012a) Finland, Terveysportti	Tietoa potilaalle: kondylooma, eli visvasyyli	- There is no evidence that condom use protects against condyloma. - Condoms should always be used with casual sex partners, as they effectively prevent the transmission of other STIs.
Hannuksela, M. (2012b) Finland, Terveysportti	Tietoa potilaalle: Sukuelinherpes (genitaalierpes) miehelli	- During the symptomatic phase of genital herpes one should refrain from sex even though the virus cannot be transmitted through condom. - As asymptomatic herpes virus is contagious, it is recommended to always use condoms.
Hiltunen-Back, E. (2009a) Terveysportti	Sairauksien ehkaisy: Klamydia	- Increased use of condom. - Chlamydia is transmitted via unprotected sex, also in oral sex.
Hiltunen-Back, E., (2009b) Finland, Terveysportti	Sairauksien ehkaisy: Sukuelinherpes	- Condom use reduces the risk of herpes, however if the cluster of blisters is outside of the area covered by the condom, transmission is possible. - Herpes is transmitted also through oral sex. If a sexual partner has oral herpes, it might be transmitted to receiver's genital area. - Condom use and refraining from sex during the active phase of herpes decreases the risk of transmission.
Tiitinen, A. (2012a) Finland, Terveysportti	Tietoa potilaalle: klamydia	- Chlamydia infection can be avoided by using a condom in intercourse.

Tiitinen, A. (2012b), Finland, Terveysportti	Tietoa potilaalle: Sukuelinherpes (genitaalierpes) naisella	<ul style="list-style-type: none">- With casual sex partners it is recommended to always use a condom to prevent STIs.- The virus is contagious especially during an outbreak. Nevertheless, half of the transmissions occur during the inactive phase or through a partner who is not aware of his/her infection.- Condom use is recommended always during an outbreak even when being in a stable relationship.- The condom use does not fully protect from transmission.
Tiitinen, A. (2013) Finland, Terveysportti	Tietoa potilaalle: Papilloomavirus naisella	<ul style="list-style-type: none">- Using a condom gives a partial protection against the transmission of the virus.