KNOWLEDGE, PERCEPTIONS, AND BEHAVIORS OF RUSSIAN COLLEGE STUDENTS REGARDING HPV, HPV-RELATED DISEASES, AND HPV VACCINATION

By
Maria V. Alexandrova

M.D., Yaroslav-the-Wise Novgorod State University, 2002
M.S., Minnesota State University, Mankato, 2008

Dissertation
Submitted in Partial Fulfillment of the requirements for the
Doctor of Philosophy Degree

Department of Health Education
In the Graduate School
Southern Illinois University, Carbondale
July 2012

AN ABSTRACT OF THE DISSERTATION OF

MARIA V. ALEXANDROVA, for the Doctor of Philosophy degree in HEALTH EDUCATION, presented on July 13th, 2012 at Southern Illinois University Carbondale.

TITLE: KNOWLEDGE, PERCEPTIONS, AND BEHAVIORS OF RUSSIAN COLLEGE STUDENTS REGARDING HPV, HPV-RELATED DISEASES, AND HPV VACCINATION

MAJOR PROFESSOR: Dr. Joyce Fetro

Background: The HPV vaccine has been introduced to the public and the medical community since June 2006 for the vaccination of females and since November 2009 for the vaccination of males ages 9-26 years old. The purposes of this research were to explore multiple factors and relationships among Health Belief Model constructs and mediating factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students and to determine which factors were most important when considering who would/would not seek HPV vaccination.

Methods: A quantitative, cross-sectional, descriptive, and correlational survey design was used in this study. An existing self-report questionnaire HPV Study Survey was adapted with the permission from the author. One thousand two hundred participants were contacted by Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia registrar's office through e-mails and messaging using two social networks through simple random sampling method using the SQL statement "ORDER BY NEWID" propriety of Microsoft algorithm out of the total student population (9,923 students). The survey was distributed through SurveyMonkey™ survey software that was activated December 2011 - April 2012.

Results: Two hundred seventy students replied to the survey (22.5% response rate) and 117 participants fully completed it (43.33% completion rate). The initial response rate increased 4.4 times using social networks messaging compared to e-mailing invitations. Overall, average knowledge levels were moderate. Participants' behaviors regarding their sexual activity showed that the majority of participants were sexually active. Participants' perceptions (suseptibilility, barriers, and benefits) were low or moderate; perceived severity was high; mediating factors (cues to action and self-efficacy) were moderate. Participants' behavioral intention to get HPV vaccination was low. There were statistically significant differences between males and females in perceived susceptibility, perceived barriers, behavioral intention, and in two behavioral items. Seventy five percent of the variance in behavioral intention getting HPV vaccination could be explained by perceived susceptibility, severity, barriers, benefits, self-efficacy, cues to action, and knowledge. Self-efficacy was the only HBM construct which statistically significantly predicted ($p<.001$) behavioral intention to get HPV vaccination.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGUES

CHAPTER I

INTRODUCTION

Statement of the Problem

Human Papilloma Virus (HPV) is an infectious disease belonging to a family of viruses that is capable of infecting humans through sexual and skin-to-skin contact routs of transmission. Forty specific HPV types infect male and female genital organs (Davies, 2009). Two-thirds of HPV strains present high risk due to their etiological association with cervical, vulvar, vaginal, penile, oral, throat, and anal cancers and one-third of HPV strains are associated with genital warts (Anhang, Goodman, & Goldie, 2004; Bosch, Lorincz, Munoz, Meijer, & Shah, 2002; Bosch & de Sanjose, 2003; CDC, 2006b; Munoz et al., 2003; WebMD, 2009; The Digene HPV Test, 2009; Shin et al., 2004). According to the Centers for Disease Control and Prevention (CDC) (2009), presently nearly 20 million people in the U.S. have HPV positive status and about six million new cases of HPV infection are diagnosed annually (Garcia & Saslow, 2007). Similar trends of increased rates in HPV infection are detected around the world, including Russia. For example, Novikov (2006) stated that, in Russia, in 1993, there were 26,231 registered patients (17.8 per 100,000) with HPV infection and six years later, there were already 37,272 patients (25.6 per 100,000) with this sexually transmitted infection. According to results of federal screening programs conducted in 2009-2010, latent HPV infection was detected in approximately 34% of patients (Batkaev, Ryumin, Drozdova, & Kucherov, 2010).

According to the CDC Vaccine Information Statement (2006b), the morbidity for cervical cancer is approximately 10,000 new cases per year in the U.S.; about 3,700 women die from it. In the world, cervical cancer takes second place as the primary cause of cancer loss among

women. In 2002, there were more than 12,200 registered cases of cervical cancer in Russia (Bray, Pisani, & Parkin, 2004). Since 1993, this morbidity rate has climbed among Russian women under 29 years old (Anticancer Society of Russia, 2010). Additionally, there is a significant health care financial burden associated with HPV. Reis et al. (2002) and Insinga, Glass, and Rush (2004) showed that for the period of five years (between 1997 and 2002), the cost of cervical cancer and genital warts was almost $3.5 billion and more than $688 million respectively.

The incidence rate of penile cancer is 1 per 100,000 men (1530 men were diagnosed in 2006; anal cancer has a slightly higher incidence rate 1.6 per 100,000 men and women (1900 men were diagnosed in 2007); and gay and bisexual men are 17 times more likely to have anal cancer (Howlader et al, 2011; Kim, Andres-Beck, & Goldie, 2007; Lunau, 2009; MedicineNet.com, 2010; Nasca, Innocenzi, & Micali, 2005; National Institute of Allergy and Infectious Diseases, n.d.; Olofinlade, et al., 2000; Palefsky, 2007). In 2002, there were more than 380 registered cases of penile cancer in Russia, which corresponded to a morbidity rate of 0.5 per 100,000 males (Anticancer Society of Russia, 2010). According to Kostyuk (2003), anal cancer is a relatively rare malignancy in Russia presenting 6% of total cancers of recto-anal region of the human body and according to Cuardo et al. (2007), the standardized annual incidence rate was 0.03 per 100,000 males in Russia. According to National Cancer Institute (n.d.b), in the U.S., the age-adjusted incidence rate of anal cancer was 1.7 per 100,000 for both genders per year, which was based on cases diagnosed in 2005-2009 from 18 Surveillance Epidemiology and End Results (SEER) geographic areas.

A new method of HPV-attributed cancer prevention was introduced with the development and application of the HPV vaccine. There are two HPV vaccines available

currently, *Gardasil*® and *Cervarix*®, which prevent HPV infection and consequently HPV-associated diseases. *Gardasil*® is a quadrivalent HPV (types 6, 11, 16, 18) recombinant inactivated vaccine. It is produced by the pharmaceutical company Merck & Co., Inc (Merck & Co, Inc., 2006). *Cervarix*® is a bivalent HPV (types 16, 18) recombinant inactivated vaccine. It is produced by the pharmaceutical company GlaxoSmithKline (GlaxoSmithKline UK, 2011). Attributable benefits of HPV vaccination include its evidence-based and highly-effective prevention of HPV-associated diseases, such as cervical, vulvo-vaginal, anal, penile, and oral-throat cancers (70% effectiveness) and genital warts (90% effectiveness). The HPV vaccines have been available for the public and medical community since June 2006 for the vaccination of females and since November 2009 for the vaccination of males (Giuliano & Palefsky, 2009; Harper et al., 2004; Koutsky, & Harper, 2006; Liddon, Hood, Wynn, & Markowitz, 2010; Munoz, Castellsague, de Gonzalez, & Gissman, 2006; Schwarz, 2010).

Need for the Study

Serious disease burden and high financial cost of the treatment connected to HPV infection and cervical, vulvo-vaginal, anal, penile, oral-throat cancers cancer calls for preventive measures, such as vaccination against HPV (Parkin & Bray, 2006; Singh, Miller, Hankey, & Edwards, 2004; Watson et al. 2008). Both available vaccines, *Gardasil*® and *Cervarix*®, are approved for medical use in Russia.

The efficacy of the HPV vaccination program depends on awareness that HPV infection is an agent that causes diseases, such as genital warts and HPV-associated cancers. Gonik (2006) stated that generally men and women are not fully aware of HPV, risks related to contracting HPV, and potential harmful outcomes to their health. Moreover, researchers have found that

many study participants are not aware the HPV causes genital warts and cervical, vaginal, anal, oral, throat, and penile cancers (Dell, Chen, Ahmad, & Stewart, 2000; Holcomb, Bailey, Crawford, & Ruffin, 2004; Lambert, 2001; Pitts & Clarke, 2002; Sankaranarayanan, 2009; Vardeman, 2008; Zimet, 2005; Zimet, et al., 2000). Knowledge and acceptance of the availability of the HPV vaccines with their disease preventable outcomes and attributable benefits also determine the efficacy of an HPV vaccination program. That is why, while HPV vaccine is available on the market, it was important to determine levels of knowledge, perceptions, and behaviors pertaining to the HPV vaccination among both female and male populations.

Many studies in the U.S. have explored knowledge, attitudes, and behaviors related to the HPV vaccination among the female and male populations (Allred, Shaw, Santibanez, Rickert, & Santoli, 2005; Anhang, Goodman, & Goldie, 2004; Boehner, Howe, Bernstein, & Rosenthal, 2003; Davis, Dickman, Ferris, & Dias, 2004; Gonik, 2006; Kahn, et al., 2005; Kahn, et al, 2008; Shikarya, et al., 2009; Wetzell, et al., 2007; etc.). These studies provided a comprehensive overview about needs of the HPV vaccine's targeted populations (9-26 year old males and females determined by clinical studies of the vaccine and FDA recommendations for the age range of this immunization). Furthermore, these research efforts facilitated inclusion of the HPV vaccination programs within federal and state-funded vaccination projects across the U.S., such as Vaccines for Children (VFC) Program, Immunization Grant Program (Section 317), Medicaid, State Children's Health Insurance Program (SCHIP) (The Henry H. Kiser Family Foundation, 2008). Eight states, including Alaska, Illinois, Louisiana, Massachusetts, Maine, New Hampshire, South Dakota, and Washington were able to find resources for uninsured or underinsured populations to fully cover HPV vaccination or make it available with reduced

prices (Women in Government, 2008). According to CDC (2011b), in the U.S., a majority of health insurances typically include FDA recommended vaccines. However, it usually takes a period of time before patients are able to take advantage of it. Since HPV vaccination is not included in the routine childhood immunization calendar and it is not covered by federally-provided universal insurance in Russia, there is a gap between availability and afforadability of the vaccine by HPV vaccine targeted populations. Taking into account, the American experience in facilitation of securing funding for HPV vaccination programs, the present study has a potential to promote facilitation of federal and regional sources of funding for the HPV immunization programs across Russia.

Limited research exists addressing acceptance, accessibility, and application of the HPV vaccine in Russia in the professional medical and public health fields. No studies were found that explored knowledge, attitudes, and behaviors among targeted populations and influential others, such as parents, partners, friends, medical professionals (nurses and doctors). Since 2006, although in Russia HPV vaccination has been recommended for girls and boys at the age of 13 years (Kutusheva, 2010), no national HPV vaccination program exists and the HPV vaccine is not included in the children's' immunization calendar (Aylamazyan et al., 2008). Only some regions fund HPV immunization programs in Russia.

Since the Russian population presented a unique socio-cultural population, the current study addressed a recommendation from previous research (Binham, Drake, & LaMontagne, 2009) that confirmed the significance of socio-cultural studies in determining the context of vaccine introduction and implementation from a community standpoint (perceptions of targeted populations). Since different findings concerning knowledge, attitudes, and behaviors regarding HPV vaccine were obtained from a Russian sample of female and male college students, there

was a need for further investigation of the barriers that were preventing Russian college students from getting HPV vaccinations. Many studies exist that solely focused on females (Black, Zimet, Short, Sturm, & Rosenthal, 2009; Brewer, & Fazekas, 2007; Conroy et al., 2009; Dursun, Altuntas, Kuscu, & Ayhan, 2009; Hoover, Carfioli, & Moench, 2000; Zimet, Liddon, Rosenthal, Lazcano-Ponce, & Allen, 2006; etc.) or males (Ferris et al., 2008; Ferris et al., 2009; Gerend, & Barley, 2009; Gilbert, Brewer, Reiter, Ng, & Smith, 2010; Simatherai, 2009; etc.) as a unit of study about knowledge, attitudes, and behaviors regarding HPV, HPV-attributed diseases, and HPV vaccine. There was a need to collect data from a sample comprised of both genders from the same sample pool because differences in knowledge, perceptions, and behaviors could be discovered. Also, it was necessary to include the male population along with female population concerning the HPV and HPV vaccination since males are primary carriers of HPV and males were approved for immunization 3 years ago.

It was necessary to conduct a needs assessment for national and regional funded vaccination programs to eliminate disparity in prevention access for those who could not afford it (Binham, Drake, & LaMontagne, 2009; Castilaw, & Wittet, 2007; Chong, Hallman, & Brady, 2006). Further research in recognition of the need for protection against HPV infection and HPV-associated diseases was critical. Finally, according to Janz, Champion, and Skinner (2002), when using Health Belief Model (HBM) in the different cultural settings, it was necessary to reestablish the reliability and validity of measures that were used in this study enhancing research on the HBM. Examining constructs (perceived susceptibility, perceived severity, perceived barriers, and perceived benefits) and mediating factors (self-efficacy, cues to action, demographic, socio-psychological, and structural factors) provided a strong theoretical framework for present investigation.

Purpose of the Study

The purpose of this research was to explore multiple factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students. A secondary purpose of this study was to determine the relationships among HBM constructs and mediating factors regarding the HPV, HPV-associated diseases, and HPV vaccination. A tertiary purpose was to determine which factors were most important when considering who will/will not seek HPV vaccination.

Research Questions

In this study, the following research questions were answered:

1. What are the levels of knowledge and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination among selected Russian college students?
2. What are the levels of HBM constructs (perceived susceptibility, perceived severity, perceived barriers and perceived benefits) and HBM mediating factors (cues to action, and self-efficacy) regarding to the HPV, HPV-related diseases, and HPV vaccination among Russian college students?
3. Do differences exist in knowledge, perceptions, and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination based on gender?
4. How much variance in behavioral intention regarding the HPV vaccination can be accounted for by other HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge?

Significance of the Study

The conducted study holds wide implications for the health education practice and professional development. This research was conducted through the theoretical framework of behavior change and barrier elimination, which are the essential goals of health education. This investigation served as a needs assessment for the Russian college student population regarding HPV vaccination. Consequently, it presented a foundation for the development and implementation of national and regional HPV vaccination programs.

Study findings could allow the development of health education intervention programs targeting areas of knowledge, attitudes, and behaviors by influencing majority of HBM constructs. According to Hochbaum (1959), this model was created to explain health behaviors of people and their unwillingness to participate in health-oriented programs. The model has been used and tested across various areas of research. Janz, Champion, and Skinner (2002) stated that, in general, people will adopt a new healthy behavior or product (in this case, HPV vaccine) if they consider themselves susceptible to a condition (HPV infection), if they think it will lead to potentially serious consequences (HPV- associated diseases), 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 estimated barriers to (or cost of) taking the action are prevailed over by its benefits.

Preventive efforts, which could be based on the findings of this performed research, will enhance the quality of life within Russian population and advance health education practices in Russia. Study findings also could lead to the improvement of the health education curricula targeting youth, as well as medical and social work professionals. The productive alliance between health education and modern medicine could be achieved through this study by

understanding knowledge levels, perceptions, and behaviors related to the HPV vaccination in this target group. Finally, this research could be replicated in other settings with other diverse populations throughout the world.

Research Design

A quantitative, cross-sectional, descriptive, and correlational survey design was used in this study. An existing self-report questionnaire *HPV Study Survey* was adapted with acquired permission from the author (Kahn, et al., 2005; Kahn, et al., 2008; Shikarya, et al., 2009; Wetzel1, et al., 2007) and, also, it was expanded to include items pertained to males and items inquiring about not only genital warts and cervical cancer, but also about other HPV-associated cancers too.

Sample

The population composed of all 18-26 years old college students, enrolled full-time at Yaroslav-the-Wise Novgorod State University (NovSU), Veliky Novgorod, Russia during December 2011 – April 2012. By looking at Polit and Hungler's (1995) table for the sample size identification, the minimum sample size for the present study was established as 200 participants. Sampling was done through simple random sampling method using the STRUCTURED QUARY LANGUAGE (SQL) statement "ORDER BY NEW IDENTIFICATION (NEWID)" propriety of Microsoft algorithm out of the total student population (9,923 students) at NovSU using registrar's office data.

Data Collection

The Human Subjects Committee of Southern Illinois University Carbondale (SIUC) and Scientific Research Provost of NovSU approvals were obtained for this study before data collection began. An electronic questionnaire, administered through *SurveyMonkey*™, was distributed for data collection purposes through e-mails and Internet social networks messages. Subsequent reminders were launched in the morning hours in two, four, six, and eight weeks after the initial posting of the survey.

Face and content validity of the instrument was established through an instrument review by the panel of experts on instrument development, behavior change theories and models, sexuality education, and measurement. The instrument was translated into the Russian language by the researcher with subsequent retranslation back into English language by experts in Russian/English languages. A pilot study was conducted with the random group of 75 Russian college students to test cover letter and data collection procedure, and to establish internal consistency reliability of the adapted and expanded instrument. Internal consistency reliability was established by calculating Cronbach's alpha and Kuder-Richardson tests of the translated survey.

Data Analysis

Parametric statistics and non-parametric chi-square test for dichotomized items were calculated through the Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010), as appropriate. Each individual survey item underwent calculation of frequencies, percentages, measures of central tendency (mean), and measures of dispersion (standard deviation). T-tests were conducted to examine differences in knowledge, perceptions,

behavioral intention, and sexual behaviors based on participants' genders. Chi-square test was used for dichotomized items on sexual behavior scale to investigate differences in those behaviors based on participants' gender. Multiple regression was performed to test how much variance in behavioral intention regarding the HPV vaccination was accounted for by HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge. Probability levels were set at 0.05.

Assumptions

Assumptions for this study included:

1. Knowledge, perceptions, and behaviors about HPV, HPV- associated diseases, and HPV vaccination are measureable concepts.
2. Russian college students were willing to participate in this research.
3. Participants answered survey questions/items honestly.
4. Participants felt a sense of constructive involvement because they were taking part in a project that contributed to the knowledge base about this vaccination to benefit educators and students in recognizing issues associated with HPV vaccination.
5. The data collection instrument was valid and reliable based upon its previous use and results of the pilot study.
6. The HBM constructs are measureable concepts.
7. Participants had equal access to the computers and Internet to be able to take part in the survey posted on *SurveyMonkey*™ web-site.
8. The study sample was a normally distributed.

Limitations

This study was subject to the following limitations:

1. This research was limited by the self-report and data accuracy of participants in this study. The sensitive and personal nature of the survey items, which include items related to sexually transmitted infection and sexual behaviors, could have prevented participants from answering survey questions honestly.
2. There were no incentives for the respondents to complete the survey. Previous research (Dillman, 2000; Duffer et al., 1994) showed that offering incentives facilitated cooperation from sample subjects in data collection.
3. This research was limited by the timeframe for survey distribution and data collection from December, 2011 through April, 2012.
4. Results of this study could not be generalized to the college student population across Russia because the research was conducted at one public university located in the regional city of Northwestern part of Russia.
5. Study results were influenced by the sensitivity of the instrument which meant the degree to which the instrument was able to identify true positive answers (in this study: knowledge, perceptions, and behaviors) correctly by discerning persons who are representatives of chosen responses (Howard, 2008).

Delimitations

This study was characterized by the following delimitations:

1. To assure manageability of the collected data, the survey instrument included only multiple choice, dichotomized-choices items, and Likert scale items and did not include open-ended response items.
2. Only males and females who were 18-26 year old college students at the selected Russian university were asked to complete the survey.
3. The survey instrument was administered electronically.
4. The study was conducted at certain geographical location at NovSU, which is situated in Northwestern part of Russia, in Veliky Novgorod.
5. The study explored subject of interest (HPV, HPV-associated diseases, HPV vaccination) within single theoretical framework (HBM).
6. Participants were asked to complete one instrument measuring knowledge, perceptions, sexual behaviors, and constructs of HBM regarding HPV, HPV-associated diseases, and HPV vaccination.

Operational Definitions

The following definitions were used in this study:

Anal cancer - malignant tumor that forms in the anal canal (passage that connects the rectum to the outside of the body) (American Society of Colon and Rectal Surgeons, 2008).

Behavioral intention – perceived likelihood of performing new behavior (Montano & Kasoprzyk, 2002).

Cervarix® - a bivalent HPV (types 16, 18) recombinant vaccine (GlaxoSmithKline UK, 2009).

Cervical cancer - malignant tumor that forms in the cervix (lowest part of the uterus) (National Cancer Institute, n.d.a).

Cronbach's alpha – statistical method assessing reliability of the instrument which "relates the variance of each item with the variance of total score for all items on the test. This method allows comparison among the items on the test to determine the relative contribution of each item to reliability" (Dignan, 1995, p.56). "Reliability coefficient of 0.70 or higher is considered "acceptable" in most social science research situations" (University of California, Los Angeles, n.d., p.4).

Cues to action – strategies to activate one's "readiness" (Janz, Champion, & Skinner, 2002).

Gardasil® – quadrivalent human papilloma virus (HPV) (types 6, 11, 16, 18) recombinant vaccine (Merck & Co, Inc., 2006).

Genital warts - benign soft, moist, or flesh growths in the genital area (National Institute of Allergy and Infectious Diseases, 2010).

Health Belief Model (HBM) – "model of individual health behavior based on a value-expectancy theory used to understand why people accept preventive health services" (Janz, Champion, & Skinner, 2002).

Human Papilloma Virus (HPV) – viral sexually transmitted infection (CDC, 2011a).

Kuder-Richardson Coefficient - statistical method assessing reliability of the instrument which show if the items within the instruments obtained the same results over a population of testing subjects. A coefficient of 0.70 or more is usually considered to be reliable (Kuder, & Richardson, 1937).

Likert-type scale – a type of attitude scale that "asks participants to respond to a series of statements by indicating whether they strongly agree (SA), agree (A), are undecided (U),

disagree (D), or strongly disagree (SD). Each response is associated with a point value, and an individual's score is determined by summing the point values of each statement" (Gay & Airasian, 2003, p. 131).

Oral and throat cancer - malignant tumor that forms in the lips, gums, tongue, inside lining of the cheeks, or he roof and floor of the mouth and in the throat (pharynx), voice box (larynx), or tonsils (Mayo Foundation for Medical Education and Research, 2010a; Mayo Foundation for Medical Education and Research, 2010b).

Perceived barriers – one's belief about the tangible and psychological costs of the advised action (Janz, Champion, & Skinner, 2002).

Perceived benefits – one's belief in the efficacy of the advised action to reduce risk or seriousness of impact (Janz, Champion, & Skinner, 2002).

Perceived severity – one's belief of how serious a condition and its sequel are (Janz, Champion, & Skinner, 2002).

Perceived susceptibility – one's belief regarding the chance of getting condition (Janz, Champion, & Skinner, 2002).

Self-efficacy – one's confidence in one's ability to take action (Janz, Champion, & Skinner, 2002).

Quality-Adjusted Life-Year (QALY) – method used to measure effectiveness and cost-effectiveness of medical products, interventions, and services by taking into account both the quantity and quality of life caused by medical product, interventions, or service; it is the mathematical output of life expectancy and a measure of the quality of the remaining life-years (Philips, 2009).

Vaccination - medical procedure of implanting live (usually weakened) or dead pathogens into an organism to stimulate production of antibodies specific to the pathogen in the event of a real attack (Biology-Online, 2005).

Vulvo-vaginal cancer - malignant tumor that forms in the vagina (tube-like channel between the bottom of the uterus and the outside of the body) and vulva (outer part of the female genital organs) (CDC, 2010).

Summary

This chapter provided statement of the problem by presenting background information about HPV, HPV-related diseases, and HPV vaccination. The need for the study was explained in detail as well as purpose of the study was outlined. Four research questions pertained to the purpose of the study were stated. The significance of the study was discussed with wide implications for the health education theory and practice, public health, health promotion, and program planning and development. The appropriate research design including sampling, data collection, and data analysis procedures were reported. Lastly, assumptions, limitations, delimitations, and operational definitions for this study were presented in this chapter.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The main purposes of this research included exploring multiple factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students; determining the relationship among HBM constructs regarding the HPV, HPV-associated diseases, and HPV vaccination; and determining which factors were most important when considering who will/will not seek HPV vaccination. This chapter reviews literature regarding the HPV, HPV-attributed diseases, prophylactic benefits, and importance of the HPV vaccination. The major influential factors pertained to the vaccination including barriers and controversial issues associated with HPV vaccination acceptance are discussed. The HBM is explained in detail with particular applicability for the HPV vaccination. Finally, reasons for male and female college students to receive HPV vaccination and recommendations on vaccine administration, vaccine safety status, compliance, and uptake of immunization are discussed.

HPV and HPV-associated Diseases

HPV is a sexually-transmitted infection. Forty specific HPV types infect male and female genital organs (Davies, 2009). Two-thirds of HPV strains present high risk due to their etiological association with cervical, vulvar, vaginal, penile, oral, throat, and anal cancers and one-third of HPV strains are associated with genital warts (Anhang, Goodman, & Goldie, 2004; Bosch, Lorincz, Munoz, Meijer, & Shah, 2002; Bosch & de Sanjose, 2003; Centers for Disease Control and Prevention (CDC), 2006b; Munoz et al., 2003; Shin et al., 2004; The Digene HPV

Test, 2009; Wallboomer et al., 1999; WebMD, 2009). In 85% of cervical cancer cases, HPV DNA for the following four HPV types is detected: type 16 in 50% of cases, type 18 in 20%, and types 31 and 45 in 15% of cases (Bosch et al., 1995; Bosch et al., 2002; Daley, 1998; Hoover, Carfioli, & Moench, 2000). For the rest of 15% of cervical cancer cases, HPV is believed to be responsible but left undetected (Bosch et al., 1995; Bosch et al., 2002; Daley, 1998; Hoover, Carfioli, & Moench, 2000). According to World Health Organization/Institute Català d'Oncologia (WHO/ICO) (2010), HPV 16 and 18 are diagnosed in 74% of invasive cervical cancers in Russian women.

Most people do not know they contracted HPV because HPV infection shows no signs or symptoms (Dunne & Markowitz, 2006; Jones & Cook, 2008; Koutsky, 1997; Vetter & Geller, 2007). It can cause warts, cervical, vaginal, anal, oral, throat, and penile lesions or abnormalities persisting in the genital tract for weeks, month, or years (Abramowitz et al., 2007; Cupp, Malek, Goellner, Smith, & Espy, 1995; Jones & Cook, 2008; Koutsky, 1997; Maloney et al., 2006; Palefsky et al., 1998; Vetter & Geller, 2007; Wiatrak, Wiatrak, Broker, & Lewis, 2004). HPV infection can be contracted through genital/genital, genital/anal, genital/oral, and skin/skin contacts at some point of partners' sexual life. That is why, even though a person being in a monogamous relationship has a chance of contracting HPV from their partner if they were infected from the previous relationships (Dell, Chen, Ahmad, & Stewart, 2000; Holcomb, Bailey, Crawford, & Ruffin, 2004; Lambert, 2001; McPartland, Weaver, Lee, & Koutsky, 2005; Pitts & Clarke, 2002).

Turkish researchers, Dursun, Altuntas, Kuscu, and Ayhan (2009), stated that about 5.5 million people in the world contract HPV infection annually. However, the CDC (2004) contradicted these findings by estimating higher rates of the HPV infection. CDC (2009) stated

presently nearly 20 million people in the U.S. have HPV positive status and about six million new cases of HPV infection are diagnosed annually (Garcia & Saslow, 2007). According to Novikov (2006), in Russia, in 1993, there were 26,231 registered patients (17.8 per 100,000) with HPV infection; six years later, there were already 37,272 patients (25.6 per 100,000) with this sexually transmitted infection. It is estimated that more than 29% of Russian females are infected with HPV (WHO/ICO, 2010). Results of federal screening programs conducted in 2009-2010, showed even higher percentage of the latent HPV infection that was detected in approximately 34% of the patients (Bakaev, Ryumin, Drozdova, & Kucherov, 2010). The majority of new HPV cases occur in sexually active 15-25 years old men and women (Markowitz et al, 2007). Dunne et al. (2007) confirmed that 40% of 14-19 year old females and 50% of 20-24 year old females contracted HPV infection but more recent data from WHO/ICO (2010) demonstrated that about 73% males were infected with HPV. The highest risk of HPV contraction is experienced during first five years after the initiation of sexual activity (Reisinger, et al., 2007; Shin, Franceschi, & Vaccarella, 2004). In the natural course of HPV infection, virus clears by itself through protective immunologic processes within two years of HPV contraction in 90% of cases (Markowitz et al, 2007). However, like majority of the viral infections, HPV infection cannot be cured. Medical treatments for HPV infection, similar to other viral infections, are symptomatic and based on relief of warts' outbreaks and removal of lesions (Eckert & Lentz, 2007; Douglas, 2008; Markowitz et al., 2007; Shoemaker, Jiang, Williamson, & Roland 2007).

Around the world, age-adjusted incidence rates of cervical cancer per 100,000 women per year were estimated in the Globacon 2002 project (Ferlay, Bray, Pisani, & Parkin, 2004). The majority of cervical cancer cases (265,884 cases) occurred in Asia. There were 78,897 cases of this malignant disease in Africa, 71,862 cases in Central and South America, 59,931 cases in

Europe, and 14,670 cases in North America (Ferlay, Bray, Pisani, & Parkin, 2004). Each year, 233,000 women die from cervical cancer around the world and 32,000 women die due to this malignancy in Europe (Dursun, Altuntas, Kuscu, & Ayhan, 2009). According to the CDC Vaccine Information Statement (2006b), in the U.S., the morbidity of cervical cancer is approximately 10,000 cases per year and about 3,700 women die from it. In 2007, there were 11,000 cases of invasive cervical cancer in the U.S. (National Cancer Institute, 2008).

According to WHO/ICO (2010), the female population of Russia (ages 15-years old and older) is 66.22 million. Annually, more than 13,000 women suffer from cervical cancer and more than half of them die due to this malignant disease. Cervical cancer is the fifth most common cancer in Russian females. Especially alarming is that cervical cancer is the second most common cancer in Russian women of reproductive age (15-44 years). In 2002, there were more than 12,200 registered cases of cervical cancer in Russia (Bray, Pisani, & Parkin, 2004). In 2010, there were already 13,000 newly-diagnosed cases of cervical cancer in Russia (Brusina, Magarill, & Kutihin, 2011). Since 1993, this morbidity rate has climbed among Russian women under 29 years old (Anticancer Society of Russia, 2010).

According to WHO/ICO (2010) and WHO/IARC (2008), cervical cancer takes second place as the primary cause of cancer loss among women in the world. It is estimated that 86% of the cervical cancer cases occur in developing countries, representing 13% of female cancers. Additionally, there is a significant health care financial burden associated with HPV and HPV-associated diseases. Ries et al. (2002) and Insinga, Glass, and Rush (2004) showed that, for the period of five years (between 1997 and 2002), the cost of cervical cancer and genital warts was almost $3.5 billion and more than $688 million respectively. HPV immunization offers high

savings for the health care system's expenditures because HPV-associated diseases screening and management cost more than $2.9 billion per year (Basu, Chapman, & Galvani, 2008).

Vaginal and vulvar cancers are rare malignancies. According WHO/ICO (2010), in 2002, there were 13,200 newly-diagnosed cases of vaginal cancer and 26,800 newly-diagnosed cases of vulvar cancer in the world, representing 2% and 3% of all gynecologic cancers respectively. Both malignancies have the same pattern as cervical cancer because 68% of vaginal cancers and 60% of vulvar cancers occur in women from developing countries. Most often, females older than 65 years old suffer from vaginal cancer and those older than 70 years old suffer from vulvar cancer. According to Merabishvili (2006), standardized index of vaginal and vulvar cancer morbidity in Saint Petersburg region of Russia is about 1.3 and 1.4 per 100,000 females.

In the world, penile cancer occurs in 1 of every 100,000 men (in the U.S., 1530 men were diagnosed in 2006); anal cancer has a slightly higher rate: 1.6 per 100,000 men and women (in the U.S., 1900 men were diagnosed in 2007); gay and bisexual men are 17 times more likely to have anal cancer (Howlader et al, 2011; Kim, Andres-Beck, & Goldie, 2007; Lunau, 2009; MedicineNet.com, 2010; Nasca, Innocenzi, & Micali, 2005; National Institute of Allergy and Infectious Diseases, n.d.; Olofinlade et al., 2000; & Palefsky, 2007). According to WHO/ICO (2010), globally, penile cancer has 0.5% burden of all male cancers. In 2002, there were more than 380 registered cases of penile cancer in Russia which corresponds to a morbidity rate of 0.5 per 100,000 males (Anticancer Society of Russia, 2010). According to Kostyuk (2003), anal cancer is a relatively rare malignancy presenting 6% of total cancers of anal and recto-anal region of the human body in Russia. In 2002, there were 99,000 new cases of anal cancer in general Russian population, among those 40% of cases occurred in men and 60% occurred in women. During the last 50 years, the incidence rate of anal cancer has increased in Russia,

especially in HIV-positive and gay populations (WHO/ICO, 2010). According to National Cancer Institute (n.d.b), in the U.S., the age-adjusted incidence rate of anal cancer was 1.7 per 100,000 for both genders per year which was based on cases diagnosed in 2005-2009 from 18 Surveillance Epidemiology and End Results (SEER) geographic areas. Scientific evidence showed the following attributable factors of anal cancer along with HPV: sexual practices such as receptive anal intercourse and having multiple sexual partners, smoking, immunosuppression due to Human Immunodeficiency Virus (HIV), and benign anal lesions (inflammatory bowel disease, hemorrhoids, fistulae or cicatrices) (American Cancer Society, 2012; CDC, 2012a; Esiashvili, Landry, & Matthews 2006; Frisch, & Johansen, 2000; Fred Hutchinson Cancer Research Center, 2004; Lin, Gridley, & Tucker, 1995).

According to WHO/ICO (2010), in 2008, there were 400,000 newly diagnosed cases of the oral and throat cancers and 223,000 people died due to these malignancies. About 67% of oral and throat cancers occur in men and women from developing countries. Scientific evidence indicated that up to 20% of these malignancies could be attributed to HPV infection due to oral sex practices. Other major risk factors include habitual use of tobacco and consumption of alcohol.

HPV types 6 and 11 cause 90% of genital warts (Bosch et al., 2008; CDC, 2006b; Greer et al., 1995; Harper et al., 2006; Lacey, Lowndes, & Shah, 2006; Munoz et al., 2009; Villa et al., 2005; WHO, n.d.). According to Kjaer et al. (2007), the morbidity rate of genital warts in Denmark, Iceland, Norway, and Sweden was assessed at 10% meaning that 1 in 10 females in this population had genital warts in their lifetime with the higher frequency in youth. In Great Britain, genital warts are widespread infection. For example, in 2004, there were more than 79,000 cases of genital warts diagnosed for the first time: 55% of cases were in males and 45%

of cases were in females (Health Protection Agency, 2005). According to O'Mahony (2005), after treatment, recurrence of genital warts was experienced in 40% of cases. Feelings of embarrassment and depression are highly prevalent in patients with genital warts (Maw, Reitano, & Roy, 1998). Key statistics on HPV related diseases in Russia presented in table 1.

Table 1

Key Statistics on HPV-related Diseases in Russia, Adapted from WHO/ICO (2010) Summary Report on Human Papilloma Virus and Related Cancers

Burden of cervical cancer and other HPV related cancers		Cases
Annual number of cervical cancer cases		13,807
Annual number of cervical cancer death		7,161
Projected number of new cervical cancer cases in 2025		13,465
Projected number of new cervical cancer death in 2025		7,397
Crude incidence rates per 100,000 population in year	Rates	
	Males	Females
Cervical cancer	-	18.2
Anal caner	0.3	0.6
Vulvar cancer	-	3.4
Vaginal cancer	-	0.7
Penile cancer	0.8	-
Oral cancer	11.8	3.6
Throat cancer	5.0	0.5
Burden of cervical HPV infection		
HPV prevalence (%) among women with normal cytology		29.1
Prevalence (%) of HPV 16 and/or 18 among women with Normal cytology		9.3
Low-grade cervical lesions		35.1
High-grade cervical lesions		56.0
Cervical cancer		74.0

Prophylactic Attributable Benefits of HPV Vaccination

Throughout the history of immunization, which started with Edward Jenner's use of material from cowpox pustules to provide protection against smallpox, the preventive advantage of vaccination with beneficial impact on human health is significant and well-known (Andre et al., 2008; Jones & Cook, 2008). Immunization can protect entire communities. It decreases the

spread of infectious agents through individual immunization and prevents the development of infection in individual community members (National Vaccine Advisory Committee, 2003).

Many researchers emphasized preventive successes of the major vaccination programs. These programs were able to control highly contagious infectious diseases with high morbidity, disability, and mortality rates, such as poliomyelitis, smallpox, diphtheria, tetanus, yellow fever, pertussis, Haemophilus influenzae, Streptococcus pneumoniae, measles, mumps, typhoid, Hepatitis A and B, rabies, and meningitis (Baker & Katz, 2004; Calandrillo, 2004; CDC, 1999; Dennehy, 2001; McCullers, 2007; WHO, 2011). For the decade between 1967 and 1977, the vaccination movement conducted by WHO resulted in the total elimination of smallpox. Before the start of this immunization campaign, smallpox caused deaths in one of four victims and endangered 60% of the world's population (WHO, 2011). In 1988, WHO with its partners initiated the Global Polio Eradication Initiative, which led to 99% of polio free population. The first half of the 21st century showed the decrease in measles morbidity rate by almost 75% in the world's population. Some countries approached absolute eradication of measles. In 2009, among the 58 tetanus high-risk countries situated primarily in Asia and Africa, this severe infectious disease was eliminated in mothers and newborns in the 16 of them (Hanson, 2010).

New vaccines are in the process of development to prevent other infectious diseases, such as cholera, rotavirus, tuberculosis, anthrax, HIV, malaria, and others (WHO, 2006). One recently developed and introduced vaccine is HPV vaccine. There are two HPV vaccines that prevent HPV infection available now: *Gardasil*® and *Cervarix*® vaccines. *Gardasil*® is a quadrivalent HPV (types 6, 11, 16, 18) recombinant inactivated vaccine produced by the pharmaceutical company Merck & Co Inc. *Gardasil*® underwent meticulous clinical testing for several years. Twenty thousand participants were included in the clinical trials. The overview of these clinical

trials and follow-up information about *Gardasil*® safety, immunogenicity, efficacy, and effectiveness were examined by Einstein et al. (2009), Garland et al. (2007), Hildesheim (2007), Joura et al. (2007), Slade et al. (2009), Sankaranarayanan (2009), The Future II Study Group (2007), Villa et al. (2006a), Villa et al. (2006b), and others in numerous studies published in diverse journals for the 5-year clinical trials phase II and for the 3-year phase III clinical trials.

Cervarix® is a bivalent HPV (types 16, 18) recombinant inactivated vaccine. It is produced by the pharmaceutical company GlaxoSmithKline. Almost 24,000 participants were involved in the pre-licensure clinical development program (GlaxoSmithKline UK, 2011). The overview of the controlled and uncontrolled clinical trials and follow-up information about *Cervarix*® safety, immunogenicity, efficacy, and effectiveness were examined by several studies presented in the different scientific publications by Descamps et al. (2009), Einstein et al. (2009), Keam and Harper (2008), Kohli et al. (2007), Koutsky et al. (2002), Le Tallec et al. (2009), Maggon, (2011), Paavonen et al. (2007), Paavonen et al. (2009), Satyaprakash, Creed, Ravanfar, and Mendoza (2009), and other researchers.

Both HPV vaccines, *Gardasil*® and *Cervarix*®, provide protection from 70% of the cancers of the cervix caused by HPV. Additionally, *Gardasil*® provides protection from 90% of anogenital warts (CDC, 2006b; FDA, 2009a; Medeiros, Rosa, da Rosa, Bozzetti, & Zanini, 2009; Munoz et al., 2003; Shikarya et al., 2009). "[HPV vaccination] is highly effective in helping protect young women from cervical cancer, cervical dysplasia, and genital warts related to … HPV [infection]" (Merck and Co, Inc., 2006, p.1). To achieve primary prevention of cervical cancer, immunization against HPV presents a proficient strategy because the cause-related role of HPV in the development of cervical cancer is well known. Munoz et al. (2004) conducted a large, international epidemiologic study. Their findings showed that the vaccination against

HPV types 16 and 18 could result in 71% increase in cervical cancer prevention in the world. Fife et al. (2004) and Villa et al. (2005) stated that since genital warts are associated with HPV infection, vaccination against HPV types 6 and 11 would make HPV vaccines even more effective because the etiological factor would be intercepted. According to Kahn et al. (2008) and Steinbrook, (2006), worldwide HPV immunization showed the promising perspective in combating racial and socioeconomic health disparities, particularly in morbidity and mortality of cervical cancer because of its 70% effectiveness in decline of cervical cancer cases.

Women around the world have an opportunity to benefit from this new vaccine developed to prevent HPV infection. The emotional stress connected to abnormal Papanicolaou (Pap) test results, diagnosis of cervical cancer, and diagnostic and treatment costs can be decreased by HPV vaccine administration (Vamos, McDermott, & Daley, 2008; Vetter & Geller, 2007). Harris (2006) showed that widespread use of the vaccine

> would save more in health expenses than the cost of buying the vaccine. In the United States, 9,710 women contract cervical cancer each year, and 3,700 die. Millions of women have annual Pap smears to test for cervical cancer, and tens of thousands undergo further expensive testing and procedures after receiving false positive tests (para. 12).

Consequently, HPV vaccine is expected to reduce the morbidity and mortality rates due to cervical cancer. According to Zimet et al. (2000),

> widespread acceptance of HPV vaccines [is] likely to lend enormous health benefits by decreasing morbidity and mortality associated with cervical cancer and by reducing the psychosocial burden of both genital warts and abnormal Papanicolaou (Pap) test results. Savings in health care expenditures, including treatments for genital warts, preinvasive cervical lesions, and cervical cancer would also be considerable (p.49).

Cost-effectiveness of HPV Vaccine

$130 per dose is estimated vendors' price of the HPV vaccines (American Cancer Society, 2010). Though, the actual charges for this immunization series (three shots over the period of six months) could be much higher (more than $500) due to the inclusion of nurses', medical doctors' services, staff time and the vaccination equipment (American Cancer Society, 2010; National Cancer Insitute, n.d.c).

Several studies based on the mathematical models were conducted to assess the monetary costs of HPV immunization against a measure of its relative health benefits incorporating direct and indirect costs (Basu, Chapman, & Galvani, 2008; Dasbach, Elbasha, & Insigna, 2006; Goldhaber-Fiebert et al., 2007; Kim, Andres-Beck, & Goldie 2007; Kim et al., 2007; Van de Velde, Brisson, & Boily, 2007). According to Basu, Chapman, and Galvani (2008),

> if both genders are vaccinated to the same level, approximately 50% of both genders, required vaccination to achieve vaccine-type elimination. However, the cost per quality adjusted life years (QALY) gained from vaccinating 50% of both genders was larger than the cost per QALY gained from vaccinating 68% of females only. Vaccination of both genders accumulated incremental discounted cost of $356.80 versus $248.55 when only females are vaccinated, for a total discounted QALY benefit of 0.01585 years versus 0.01679 years (p. 19019)

Kulasingam, Benard, Barnabas, Largeron, and Myers (2008) confirmed stated above findings:

> vaccination with screening, compared to screening alone, was associated with an incremental cost-effectiveness ratio of £ 21,059 [$34,292] per QALY and £34,687 [$56,484] per life year saved (LYS). More than 400 cases of cervical cancer, 6,700 cases

> of cervical intraepithelial neoplasia and, 4,750 cases of genital warts could be avoided per 100,000 vaccinated girls (p.1).

Overall, the cost effectiveness of HPV vaccination along with routine screening programs was found to be cost effective in majority of studies with the cost per life years gained between $32,000 to $93,000 (Bergeron, Largeron, McAllister, Mathevet, & Remy, 2008; Brisson, Van de Velde, De Wals, & Boily, 2007; Goldie et al., 2004; Kulasingam et al., 2007; Sanders & Taira, 2003).

Major Factors Influencing HPV Vaccination

There are a variety of reasons associated with difficulties in immunizing college students against HPV. Many studies have been conducted in the U.S. about knowledge/awareness, attitudes, and behaviors pertained to HPV and HPV associated diseases among males and females, their parents, and medical professionals. Research has found that, generally, the U.S. population has a lack of knowledge about HPV (Allred, Shaw, Santibanez, Rickert, & Santoli, 2005; Boehner, Howe, Bernstein, & Rosenthal, 2003; McPartland, Weaver, Lee, & Koutsky, 2005; Pitts & Clarke, 2002; Waller et al., 2003; Zimmerman, 2006). Only about 67% of females and 50% of males had some level of awareness about HPV (Gonik, 2006; McPartland, Weaver, Lee, & Koutsky, 2005). Additionally, there is little awareness that HPV is a sexually transmitted disease associated with genital warts and cervical cancer (Allred, Shaw, Santibanez, Rickert, & Santoli, 2005; Boehner, Howe, Bernstein, & Rosenthal, 2003; Lambert, 2001; McPartland, Weaver, Lee & Koutsky, 2005; Pitts & Clarke, 2002; Waller, et al., 2003; Zimmerman, 2006), with oral and throat, penile, and anal cancers (Brewer, Ng, McRee, & Reiter, 2010; Fernandez et al., 2009; Larson, 2011; Reiter, Brewer, McRee, Gilbert, & Smith, 2010). Consequently, existing lack of awareness creates barriers for the acceptance of HPV vaccination.

Several researchers showed that college students often do not seek preventive healthcare and that is why it is more likely that they will not get exposed to the HPV vaccination. For example, Woodwell and Cherry (2004), in their national data survey, reported that when comparing adolescents with other age groups, adolescents seek regular healthcare less frequently. According to Rose and Ayad (2008), college students expressed unfavorable attitudes towards immunization. HPV vaccination takes three appointments within six consecutive months and adolescents habitually do not make necessary visits to their medical services provider (Kantor, 2007). Conroy et al. (2009) confirmed that the majority of study participants (13-26 years old girls and women) reported their barrier to HPV vaccination being failure to return for scheduled medical visits or failure to schedule subsequent visits to their health care provider.

Grace (2006) confirmed that adolescents who were college students were not fully covered by immunization programs. "Childhood vaccination rates are at an all-time high, but immunization falls off dramatically during adolescence (ages 11–19)" (Grace, 2006. p.1). Adams, Newacheck, Park, Brindis, and Irwin (2007) emphasized that, among 23-24 year old young people, lifetime insurance rates fell dramatically, while among 13-14 years old youth, it is at its' highest in the assessment of insurance coverage of the American population. Wei, Sangweni, Butts, and Merlino (2001), also, indicated that "the accessibility of immunization service correlates significantly with ethnicity, immigration status, primary language, years of residence in the USA, accessibility of immunization information, insurance status, employment status, and personal and family income" (p.87). Thus, there is a need to increase adolescent immunization rates within an agenda of adolescent health and the availability of new vaccines (Grace, 2006).

Kimmel (2006) elaborated in his study that adolescents' health perceiving behavior impacted their decisions: “adolescents seldom consider the future consequences of their actions, and it is unlikely that fear of HPV and cervical cancer would change their sexual behavior, especially when cervical cancer may take years to develop” (p.20). Kahn et al. (2007) agreed that sexual behaviors of adolescents were based on their confidence in their personal invulnerability and on peer pressure and societal demands. Furthermore, Turchik and Gidycz (2012) emphasized that, even though, awareness about risky sexual behaviors among college youth is high, this problem continues to be an actual and major issue for college students’ health.

College students, who meet eligibility age for the HPV vaccination, could be influenced in making decisions about health, particularly about vaccinations, by their parents. Rosenthal and Stanberry (2005), Poston (2009), and Vardeman (2008) confirmed that parents influence and guide their children about vaccinations. Specifically, parents provide transportation and insurance coverage, and give their consent for vaccination. However, parents of college students might decline to have their sons and daughters vaccinated. Dempsey, Zimet, Davis, and Koutsky (2006) and Ogilvie et al. (2008) emphasized that the decision-making process of parents considering HPV immunization is based on their beliefs and attitudes toward the HPV vaccine rather than on knowledge about HPV. Particularly, parental concerns are mainly associated with their apprehension about HPV vaccine safety and side effects and that HPV vaccination could promote earlier engagement in sexual activity (Brabin, Roberts, & Kitchener, 2007; Brewer & Fazekas, 2007; Constantine & Jerman, 2007; Davis, Dickman, Ferris, & Dias, 2004; Diekema, 2005; Gonik, 2006; Moraros et al., 2006; Woodhall, et al., 2007).

Healthcare providers also impact accessibility and compliance with recommended vaccinations. According to Robb-Nichloson (2007), “some parents and others contend that the

decision about whether to vaccinate a girl against a sexually transmitted disease is best left to her family, in consultation with her pediatrician or family physician" (p.2). Thus, pediatricians, gynecologists, and family physicians should acknowledge attitudes of patients' parents and their knowledge about HPV and concerns regarding HPV vaccination. Zimet (2005) stated that "… health care providers will need to be prepared to provide patients and parents with information about HPV and HPV immunization and to respond productively to the rare parent who expresses opposition to HPV vaccine or any other vaccine" (p.17). Kahn et al. (2007) conducted a qualitative study to assess pediatricians' attitudes towards HPV immunization. The majority of pediatricians were concerned about HPV susceptibility in youth, which impacts adolescents' health status. When compared to boys, girls were regarded as a higher risk group for HPV and HPV-associated diseases. In a survey of gynecologists, Raley, Followwill, Zimet, and Ault (2004) found that 17 years of age was identified as preferable for the HPV immunization, while there was frank unwillingness to immunize 13-year old teenagers. Thus, college students were a more favorable HPV vaccination target group for gynecologists. Also, professional organizations' (the American College of Obstetrician and Gynecologists) guidelines greatly influenced whether gynecologists recommended HPV vaccination to their patients (Raley, Followwill, Zimet, & Ault, 2004). The same trends in attitudes towards this sexually transmitted infection vaccination were found in the study of nurse practitioners (Mays, Strum, & Zimmet, 2004a). Kimmel (2006) emphasized that family physicians expressed concerns about unavailability of the HPV vaccines for the targeted group at the affordable price, especially for those who do not have health insurance and for those whose medical insurance plan does not include this immunization.

Another difficulty encountered with HPV vaccination is the need for multiple doses of HPV vaccination. The expensive cost of $360 for three doses of *Gardasil*® and $270-360 for three doses of *Cervarix*® with three healthcare visits might also discourage patients from seeking immunization (Pollack, Balkin, Edouard, Cutts, & Broutet, 2007; Sankaranarayanan, 2009; Vetter & Geller, 2007). Agosti and Goldie (2007), Herzog, Huh, Downs, Smith, and Monk (2008), and Mortensen (2010) named cost of the HPV vaccines as the ultimate barrier to wide spread immunization. Eighteen to twenty-two year old males and females reported that they would likely to receive HPV immunization if they did not have to pay for it out of pocket (Mortensen, 2010). HPV vaccination is not covered by all insurance plans. Conroy et al. (2009) emphasized that "insurance coverage for vaccination was associated with more than five times the odds of having received the HPV vaccine" (p.1681). While, vaccination is a cost-effective prevention technique, HPV vaccine is an expensive vaccine and may lead to disparity in prevention access for those who cannot afford it (Pollack et al., 2007; Sankaranarayanan, 2009; Vetter & Geller, 2007).

Religious opposition interferes with and prevents access to vaccination. Among other factors, religious beliefs about sexual life and vaccine administration was shown to be an ultimate barrier for HPV immunization (Brewer & Fazekas, 2007; Dempsey, 2006; Munsell, Gray, Reed, Vasquez, & Vlasak, 2010). Colgrove (2006) stated that "controversy over the product [HPV vaccine] began before it was licensed; when some religious conservatives [and parents] expressed concern that the availability of a vaccine against a sexually transmitted disease would undermine abstinence-based prevention messages" (p. 2390). Brabin, Roberts, Farzaneh, and Kitchener (2006), Davis, Dickman, Ferris, and Dias (2004), Marlow, Waller, and Wardle (2007), Mays, Strum, and Zimmet, G. (2004b), Noakes, Yarwood, and Salisbury (2006) and

Waller, Marlow, and Wardle (2006) confirmed these attitudes in their parental surveys of American population. The Danish Centre for Health Technology Assessment (2007) and Mortensen (2010) contradicted their American colleagues in their studies of Danish parents (males and females) who did not perceive HPV being sexually transmitted disease as a barrier to immunization. Danish parents considered route of HPV transmission to be an incentive to vaccinate girls and boys. Also, sexual abstinence before marriage was not perceived as rational prevention method against HPV infection.

In the Californian statewide study, Constantine and Jerman (2007) found that non-Catholic Christians, born-again or evangelical Christians, and more than once-a-week religious services attendees were less likely to support HPV immunization. There is still on-going discussion in the mass media, among health professionals, political leaders, and in college communities about mandatory vaccine requirements. Some religious groups oppose HPV vaccination because HPV is a sexually transmitted disease (Schiller & Davies, 2004). In their pilot study Moraros, et al. (2006) confirmed that 38% of surveyed women reported that HPV vaccines for 10-14 years old teenage girls would not be endorsed by their church. Charo (2007) and Moraros et al. (2006) elaborated that those who opposed mandatory HPV immunization do so because they feared that this vaccine would have an unrestraining impact on youth and promote onset of the sexual activity among teens who otherwise practice abstinence. Consequently, some religious and conservative groups have argued against proposals to make HPV vaccinations mandatory for children in schools on the basis that vaccinating young girls would lead to promiscuity (Charo, 2007; Gibbs, 2006; Moreno, Berger, & Singer, 2006).

Recommendations for HPV Vaccination

Gardasil® was approved by the U.S. Federal Food and Drug Administration (FDA) in June 2006 for vaccination of 9-26 years old females, and in October, 2009, for vaccination of 9-26 years old males. It was permitted by the European Commission on Drugs Approval in September, 2006 for vaccination of 9-26 years old females and 9-15 years old males (FDA, 2009a; FDA 2009b; & Merck, 2006). It was also approved in Canada, 27 member states of the European Union, Australia, New Zealand, Brazil, and Russia (American Cancer Society, 2009; ASHA, 2007; Armstrong, 2007; Bond, 2009; CDC 2006a). According to Bayas, Costas, and Munoz (2008), Irwin (2008), Madrid-Marina, Torres-Poveda, Lopez-Toledo, and Garcia-Carranca (2009), and Tovar, Bazaldua, Vargas, and Reile (2008), *Gardasil*® did not present major safety concerns and its immunogenicity showed persistence of antibodies through 6.5 years.

Cervarix® was approved by the European Commission in September, 2007 and by the U.S. FDA in October, 2009 for vaccination of 10-25 years old females (GlaxoSmithKline, 2009; Immunization Action Coalition, 2009). Also, it was approved for use in more than 100 countries worldwide including Canada, 27 member states of the European Union, Australia, New Zealand, Brazil, Russia, Singapore, the Philippines, South Korea, and Taiwan (Gillison, Chaturvedi, & Lowy, 2008; Goldhaber-Fiebert et al., 2007; Harris, 2006; Honey, 2006; Jones, & Cook, 2008; Kimmel, 2006; Markowitz, 2007; Marra, Cloutier, Oteng, Marra, & Oglivie, 2009). According to Dessy (2008), Harper, (2008), Irwin (2008), Petaja et al. (2009), and Schwarz and Leo (2008), *Cervarix*® did not present major safety concerns and its immunogenicity showed persistence of antibodies through 5 years.

HPV infection is sexually transmitted and is often acquired soon after the initiation of sexual activity, therefore, these vaccines are most effective for females and males before they become sexually active (Dunne & Markowitz, 2006; Ferris et al., 2009; Garnett, Kim, French, & Goldie 2006; Markowitz et al., 2007; Pollack et al, 2007). The vaccine also recommended to be administered to the sexually active women and men, but it could be less effective if the individual had prior exposure to HPV (Frazer, 2006; Markowitz, 2007; Sawaya & Smith-McCune, 2007; Schmiedeskamp & Kockler, 2006). Armstrong (2007) emphasized that "sexually active females who have not been infected with any of the HPV vaccine types would receive full benefit from vaccination.Vaccination would provide less benefit to females if they have already been infected with one or more of the four vaccine HPV types" (p.1394). The Advisory Committee on Immunization Practices (ACIP) recommended that HPV vaccine be commonly offered to 11-12 years old girls (CDC, 2006a). The ACIP also allows HPV immunization of girls and young women 13-26 years old and girls who are 9 years old at the prudence of their physician (CDC, 2006a; FDA, 2009a; Markowitz, 2007) and 9-26 years old males (FDA, 2009b; Immunization Action Coalition, 2009; The Digene HPV Test, 2009). Austria and Greenland were the first two countries where HPV vaccination was offered for males (WHO, n.d.).

College students would be more likely protected against carcinogenic types of HPV by establishing vaccination as a necessary part of their health care. Colgrove's (2006) study showed that it is more efficient to make vaccination mandatory than voluntary.

> A large body of evidence demonstrates that school-based [regulations] are an effective and efficient way of boosting vaccine-coverage rates. Requiring HPV vaccination by [regulations] will almost certainly achieve more widespread protection against the disease

> than will policies that rely exclusively on persuasion and education. In the view of advocates, this effectiveness provides a clear justification (p.2390).

Consequently, the ultimate goal of disease prevention could be achieved by a mandatory HPV vaccination program as well as promotion and preservation of the health and well-being of adolescents.

HPV Vaccine Safety and Side Effects

Many researchers stated that both HPV vaccines *Gardasil*® and *Cervarix*® did not present major safety concerns during vigorous clinical trials. According to Bayas, Costas, and Munoz (2008), Irwin (2008), Madrid-Marina, Torres-Poveda, Lopez-Toledo, and Garcia-Carranca (2009), and Tovar, Bazaldua, Vargas, and Reile (2008), *Gardasil*® did not present major safety concerns and its immunogenicity showed persistence of antibodies through 6.5 years. According to Dessy (2008), Harper, (2008), Irwin (2008), Petaja et al. (2009), and Schwarz and Leo (2008), *Cervarix*® did not present major safety concerns and its immunogenicity showed persistence of antibodies through 5 years.

There were systemic and non-systemic adverse effects recorded by the HPV vaccines producing pharmaceutical companies Merck & Co., Inc. and GlaxoSmithKline. As for *Gardasil*®, some systemic side-effects in the control group (vaccinated group) showed minor increase compared to the placebo group (not vaccinated group) (Campos-Outcalt, 2009). Table 2 shows 14 systemic adverse effects of *Gardasil*®. According to Campos-Outcalt (2009), non-systemic side-effects (adverse reactions at the injection site) of *Gardasil*® had slightly higher rates in the control group (vaccinated group) than in the placebo (not vaccinated group) too.

Table 2

Systemic Adverse Events of Gardasil® in 9-23 years old Females, Adapted from CDC (2007)

Adverse events occurring 1-5 days post-vaccination	Control group: *Gardasil®* recipients (N=5088)	Placebo group: Placebo recipients (N=3790)
Pyrexia	13.0%	11.2%
Nausea	6.7%	6.6%
Nasopharyngitis	6.4%	6.4%
Dizziness	4.0%	3.7%
Diarrhea	3.6%	3.5%
Vomiting	2.4%	1.9%
Myalgia	2.0%	2.0%
Cough	2.0%	1.5%
Toothache	1.5%	1.4%
Upper respiratory tract infection	1.5%	1.5%
Malaise	1.4%	1.2%
Arthralgia	1.2%	0.9%
Insomnia	1.2%	0.9%
Nasal congestion	1.1%	0.9%

There is the Vaccine Adverse Events Reporting System (VAERS) under auspice of CDC and FDA to track severe and rare side-effects of the HPV vaccine. However, even though drug producing companies are mandated to report any assumed/observed adverse reactions, pharmaceutical and health care providers, and patients (clients/consumers) are allowed to report suspected side-effects to VAERS, it is a passive reporting system, that is why some adverse reactions could be under reported or over reported being concurrent conditions which were not induced by HPV vaccine (Campos-Outcalt, 2009).

Slade et al. (2009) reviewed the VAERS reports that were accumulated for the first two and a half years after *Gardasil*® was licensed and more than 23 million doses of this vaccine were administered. They demonstrated that for the first two and a half years after licensure 12,424 side-effects were reported to VAERS and the following five adverse reactions were most often noted: syncope, dizziness, nausea, headache, and injection site reactions (Slade et al., 2009). Only 6% of the reported side-effects were considered as the serious adverse reactions; there were 32 deaths reported within 47 days of receiving HPV immunization: 43 mortality cases were caused by concurrent conditions of different nature and in other four mortality cases the causes were not clearly identified (Slade et al., 2009). Currently, there are studies that continue to monitor potential rare and adverse reactions of the HPV vaccine, therefore, safety of the HPV immunization is under unremitting surveillance (Campos-Outcalt, 2009).

Compliance with the HPV Immunization and Current Status of the HPV Vaccination

Studies regarding HPV vaccine acceptance have been conducted, taking into account acceptability of previous vaccines, by distributing questionnaires to girls and boys, young men and women, parents of the girls and boys, and health care providers. Kahn, Rosenthal, Hamann, and Bernstein (2003) reported that most of the young women who received questionnaires about the HPV vaccination expressed positive attitudes about it and they were interested in getting the vaccination themselves and in immunizing their daughters. In a study of 256 college students, Boehner, Howe, Bernstein, and Rosenthal (2003), found that "74% endorsed HPV vaccination" (p.776). Similarly, Hoover, Carfioli, and Moench (2000) assessed HPV awareness and attitudes toward HPV vaccination among 60 female adolescents and young adults and found that "almost all of the participants expressed interest in receiving a vaccine that would prevent cervical cancer and genital warts" (p. 379). Many researchers found that parents had positive attitudes towards HPV vaccination; 70-90% of parents indicated that they would endorse this immunization for their children (Boehner, Howe, Bernstein, & Rosenthal, 2003; Brabin, Roberts, Farzaneh, & Kitchener, 2006; Danish Centre for Health Technology Assessment, 2007; Davis, Dickman, Ferris, & Dias, 2004; Kahn, Rosenthal, Hamann, & Bernstein, 2003; Marlow, Waller, & Wardle, 2007; Slomovitz, et al. 2006; Zimet et al., 2000). Olshen, Woods, Austin, Luskin, and Baucher, (2005) stated that "parents will support the use of vaccine to prevent sexually transmitted diseases, including HPV, especially after receiving and understanding the potential outcomes of the disease" (p. 249). However, HPV vaccination in the U.S., Russia, Korea and other countries is still underutilized.

Up-to-date status of the HPV immunization varies around the world. In the U.S., for the first 2.5 years after *Gardasil*® was licensed more than 23 million doses of this vaccine were administered (Slade et al., 2009) and about 32 million doses of HPV vaccines were injected by September 2010 (WebMD, 2011). In 2007, immunization surveillance conducted in six states showed that HPV vaccination uptake among 11-18 years old girls varies from 6% to 25% (Barlett, Williams, & Curtis, 2008; CDC, 2008). Rosenthal et al. (2008) stated that only 26% of American health care providers reported that their female patients initiated or finished HPV vaccination. Khan et al. (2008) showed a lower rate of vaccination by reporting that only 5% of the surveyed females began to receive HPV vaccine, even though 66% of them indicated their intention to get it. Data from the National Immunization Survey – Adult showed that only 10% of females 18-26 years old started HPV immunization series (Jain et al., 2009). The intention to comply with the HPV immunization increased among American males because of its genital warts prevention feature (Jones & Cook, 2008). However, the number of men who actually received HPV vaccine was not reported in their study.

Among Canadian parents, 70% showed affirmative intentions to have their daughters immunized against HPV (Ogilvie et al., 2007). Uptake of the HPV vaccination ranged across Canadian provinces: 50% for Ontario and up to 85% for Newfoundland and Labrador (Irwin, 2008). In Australia, 80% of 11-12 years old girls received all three doses of HPV vaccine by the middle of 2008 (Irwin, 2008). In Great Britain, about 71% of school girls received first dose of HPV vaccine and about 69% of them received second dose (Brabin et al., 2008). According to National Board of Health News Centre (2009), by the beginning of 2009 in Denmark, where HPV immunization was included into childhood vaccination program for the 12-year old girls and free of charge for 13-15 year old girls, about 71% of girls born 1993-1995 received the HPV

vaccine. In Moscow region of Russia, during the first year of HPV vaccination project HPV immunzation up-take among 12-13 years old girls in was 30% during fist six months, 42% during nine months, and 68% during 11 months initial launching (Krasnopolsky, Zarochentseva, Serova, Bulychyova, & Belaya, 2010). However, overall HPV vaccination rates in Russia are low because there are no federally funded HPV immunization programs, HPV vaccine is not included into children's vaccination calendar and to the federally funded universal health insurance coverage, and only few regions sponsor HPV vaccination projects for youth (WHO, 2008).

Theoretical Framework

The Health Belief Model (HBM) is one of the most frequently applied theoretical frameworks in health education (Painter, Borba, Hynes, Mays, & Glanz, 2008). The HBM, as a value-expectancy theory, addresses behavioral change or adoption of the new health-related product at the individual level. Research based on the HBM addresses four major aspects: constructs of the model, relationship among them, understanding of health-related behaviors, and ways of changing unhealthy behaviors with positive public health impact (Janz, Champion, & Skinner, 2002).

According to Hochbaum (1959), this model was created to explain health behaviors of people and their unwillingness to participate in health oriented programs. HBM was developed by social psychologists, Godfrey Hochbaum and Irvin Rosenstock, working on request from the U.S. Public Health Service to explain why the project that provided free tuberculosis X-ray screening at the convenient locations for people was generally underutilized. Hochbaum and colleagues (1959) surveyed about 1,200 adults to investigate this problem and found that out of total number of participants who received X-ray screening, majority (82%) underwent this

preventive measure because they believed that they were susceptible to tuberculosis and they early perceived early detection as an option for the better health outcomes. A minority of participants (21%) who received X-ray screening did not indicate the same sets of beliefs. Thus, the model, which evolved based on Hochbaum (1958) findings, suggested that perceived threat of disease, which was comprised of perceived susceptibility (risk of acquiring tuberculosis) and perceived severity (consequences of undiagnosed or belatedly diagnosed tuberculosis) played a major role in performance of the health-oriented behaviors or adoption of the new health products. Also, it was inferred that people would be more likely to accept preventive health services if they believed that perceived benefits (confirmation of tuberculosis free status, or early diagnosis of the disease) offset its perceived barriers (such as thinking that one will be mistreated by his/her family members/friends if tuberculosis was confirmed; feeling scared to find out his/her tuberculosis status; absence or lack of health insurance to have a treatment if tuberculosis status turned out to be positive; feeling scared of treatment for tuberculosis; and feeling scared of the radiation during X-ray screening).

Two more HBM model constructs were added later as modifying factors (cues to action and self-efficacy) by Becker, Drachman, and Krischt (1974) and Rosenstock, Strecher, and Backer (1988). These authors showed that cues to action for people to come and receive preventive services and self-efficacy of participants could play significant roles in the adoption of health oriented behaviors and new health products. Cues to action include mass media announcements/publications about the service; health care workers' (nurses, doctors) recommendations to their patients; cards-reminders about availability and business hours of the services; suggestions from family members, significant others, and friends; personal experiences of family members, significant others, friends, or co-workers with particular disease, health

behavior, or health-oriented product. Self-efficacy is characterized by level of confidence of the targeted population to be able to use or action in behavioral change offered preventive services.

Thus, to achieve an effective and sustainable behavior change or acceptance of the new service or product, all six constructs (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) are needed to be taken into account (Harrison, Mullen, & Green, 1992). The model has been used and tested across various areas of researches and studies. Janz, Champion, and Skinner (2002) stated that

> in general, it is now believed that people will take action to prevent, to screen for, or to control ill-health conditions if they regard themselves as susceptible to condition, if they believe it would have potentially serious consequences, 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 (pp. 47-48)

Figure #1 provides a comprehensive overview of constructs and mediating factors that lead to health behavior. This figure was adapted from Becker, Drachman, and Krischt (1974) and from Janz, Champion, and Skinner (2002) and restructured and tailored to better meet purpose of this study, answer reseach questions, and fully explore the topic of interest of the study.

HBM has been used to assess immunization uptake (Blue & Valley, 2002; Brewer et al., 2007; Brewer & Fazekas, 2007; Chapman & Coups, 1999). Furthermore, HBM has been recently used in HPV and HPV vaccine studies (Brewer & Fazekas, 2007; Kahn et al., 2008; Reiter, Brewer, Gottlieb, McRee, & Smith, 2009). Specifically, the following variables were examined: 1) perceived risk (or susceptibility), which is the belief that HPV infection and HPV-associated diseases are likely to occur; 2) perceived severity, which is how severe the negative effects of

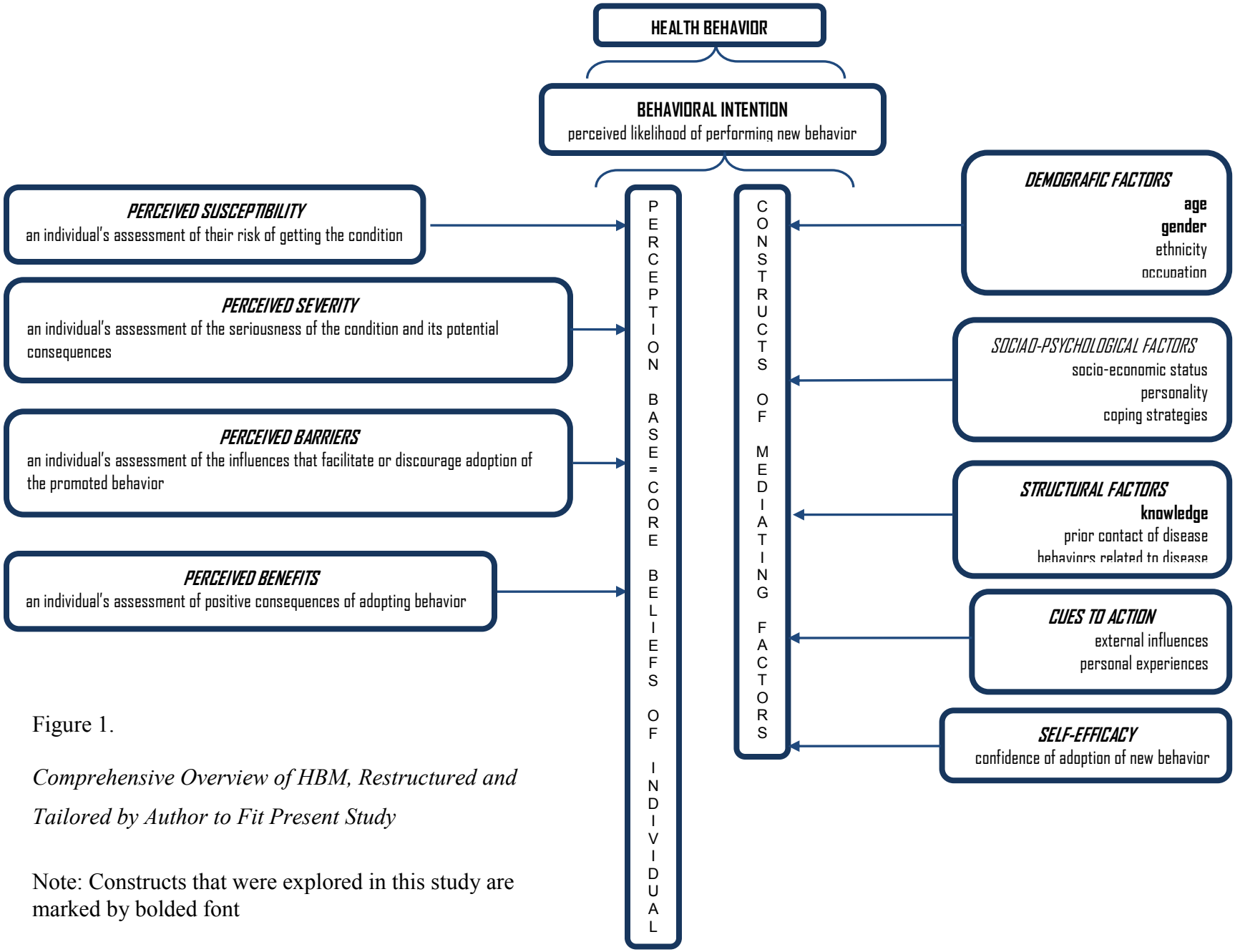

Figure 1.

Comprehensive Overview of HBM, Restructured and Tailored by Author to Fit Present Study

Note: Constructs that were explored in this study are marked by bolded font

HPV infection and HPV-associated diseases are believed to be; 3) perceived effectiveness (or benefit), which is the belief that HPV vaccine will diminish the risk or severity of HPV infection and HPV-associated diseases; 4) perceived barriers, which are any perceived obstacles preventing HPV vaccination; 5) cues to action, which are situational factors prompting HPV vaccination, such as a doctor's recommendations and family members' advices; and 6) self-efficacy, which is a confidence level of taking recommended preventive health measures, in this case, HPV vaccination.

According to Kahn (2008), the following constructs of HBM were independently attributed to the intention of participants to receive HPV vaccination: cues to actions (belief that influential people would approve HPV immunization), perceived severity (higher perceived severity of cervical cancer and genital warts), and perceived barriers (safety of HPV vaccine). In the theory-informed systematic review, Brewer and Fazekas (2007) reported that the following HBM constructs were investigated in various studies. Perceived likelihood (susceptibility to HPV infection) was studied by Ramirez, Ramos, Clayton, Kanowitz, and Moscicki (1997) and Yacobi, Tennant, Ferrante, Pal, and Roetzheim, (1999) who reported that only 21% to 46% of youth perceived themselves as being susceptible to HPV. Perceived susceptibility to cervical cancer was studied by Anhang, Wright, Smock, and Goldie (2004), Kahn, Rosenthal, Hamann, and Bernstein (2003), and Kahn et al. (2005) who showed that adult women perceive themselves as highly susceptible to cervical cancer. High perceived susceptibility to HPV (Boehner, Howe, Bernstein, & Rosenthal, 2003; Fazekas, Brewer, & Smith, 2008; Friedman & Shepeard, 2006; Giuseppe, Abbate, Liguori, Albano, & Angelillo 2008; Olshen et al., 2005) and cervical cancer (Basu, Chapman, & Galvani, 2008; Fazekas, Brewer, & Smith, 2008; Gerend, Lee, & Shepherd, 2006) was shown to be associated with higher self-efficacy and acceptance of getting HPV

vaccination. Perceived susceptibility of cervical cancer and genital warts was significantly lower in the participants who received HPV vaccine (Basu, Chapman, & Galvani, 2008).

Perceived severity of HPV was examined by Boehner, Howe, Bernstein, and Rosenthal (2003), Dempsey, Zimet, Davis, and Koutsky (2006), and Kahn, Rosenthal, Hamann, and Bernstein (2003) who reported that higher perceived severity of HPV did not show an association with higher acceptance and intention of getting HPV vaccination. Perceived severity of cervical cancer was studied by Anhang, Wright, Smock, and Goldie (2004), Hoover, Carfioli, and Moench (2000), Kahn, Rosenthal, Hamann, and Bernstein (2003), Kahn et al. (2005), Mays et al. (2000), and Mays, Sturm, and Zimet (2004b) who reported high perceived severity of this malignant disease in women.

Perceived benefits of HPV vaccination were investigated by Davis, Dickman, Ferris, and Dias (2004), Dempsey, Zimet, Davis, and Koutsky (2006), Zimet et al. (2005), and Zimet et al. (2000) who showed that higher perceived benefits (effectiveness of HPV immunization) were associated with higher acceptance and intention of getting HPV vaccination. Fazekas, Brewer, and Smith (2008), Leader, Weiner, Kelly, Hornik, and Cappella (2009), Mortensen (2010), and Giuseppe et al. (2008) reported that the primary perceived benefits were prevention of cervical cancer and HPV infection (Moraros et al., 2006). Moraros et al. (2006) also reported the following HPV immunization benefits perceived by the women: women could feel less worried and would live longer and healthier lives after vaccination. Interestingly, “cervical cancer survivors, in particular, express the wish that vaccinations might prevent infertility and unwanted childlessness” (Korfage, Essink-Bot, Daamen, Mols, & Van Ballegooijen, 2008, p.1188).

Perceived barriers to HPV vaccination were examined by numerous researchers. The following perceived constrains were associated with lower acceptance, intention, and self-

efficacy, in getting HPV vaccination: concern that HPV immunization could promote promiscuity among youth (Basu, Chapman, & Galvani, 2008; Constantine & Jerman, 2007; Davis, Dickman, Ferris, & Dias, 2004; Moraros et al., 2006; Woodhall et al., 2007); cost of the vaccine (Boehner, Howe, Bernstein, & Rosenthal, 2003; Hoover, Carfioli, & Moench, 2000; Mortensen, 2010; Vetter & Geller, 2007); low perceived vaccine safety (Boehner, Howe, Bernstein, & Rosenthal, 2003; Binham, Drake, and LaMontagne, 2009; Brabin et al., 2008; Gerend, Lee, & Shepherd, 2006; Slomovitz et al., 2006; Woodhall et al., 2007); anticipated side effects (Binham, Drake, & LaMontagne, 2009; Korfage et al., 2008); quality of delivery of the vaccine (Binham, Drake, & LaMontagne, 2009), effect on fertility (Binham, Drake, & LaMontagne, 2009); church's disapproval and religious objections (Constantine & Jerman, 2007; Slomovitz et al., 2006); and lack of information about the benefits of vaccination (Mortensen, 2010; Dempsey, Zimet, Davis, & Koutsky, 2006; Gerend, Lee, & Shepherd, 2006).

Cues to action for the HPV immunization were investigated in several studies. The following cues to action were associated with higher acceptance, intention, and self-efficacy in getting HPV vaccination: physicians' and or other health care professionals' recommendations to receive HPV vaccine (Boehner, Howe, Bernstein, & Rosenthal, 2003; Gerend, Lee, & Shepherd, 2006; Giuseppe et al., 2008; Mortensen, 2010; Zimet et al., 2000); immunization school requirements (Dempsey, Zimet, Davis, & Koutsky, 2006); parental encouragement (Giuseppe et al., 2008; Mortensen, 2010; Zimet et al., 2000); parental financial support (Mortensen, 2010); and personal experience of someone with cancer (Giuseppe et al., 2008; Kahn, Rosenthal, Hamann, & Bernstein, 2003; Mortensen, 2010). Interestingly, Giuseppe et al. (2008) reported that having at least one parent who is a health care professional was associated with intent to get HPV immunization.

Summary

Comprehensive literature review pertained to the topic of interest was presented in this chapter. HPV and HPV-associated diseases were descried along with information about the disease preventive benefits of HPV vaccination and its' cost-effectiveness. The multiple factors influencing HPV immunization including barriers and controversial issues associated with HPV vaccination acceptance were discussed including patients' and their parents' attitudes; health care providers influence; religious objections to the HPV vaccination; financial difficulties that might discourage patients from receiving vaccination; and concerns about safety and side-effects of HPV vaccine. Recommendations on vaccine administration as well as vaccination compliance and uptake were covered in this chapter. Finally, grounds for the theoretical framework were described in a comprehensive depth with introduction of new HBM outlook that was restructured and tailored to present study by the author.

CHAPTER III

METHODS

Introduction

The purpose of this research was to explore multiple factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students. A secondary purpose of this study was to determine the relationships among HBM constructs and mediating factors regarding the HPV, HPV-associated diseases, and HPV vaccination. A tertiary purpose of this research was to determine which factors were most important when considering who will/will not seek HPV vaccination. This chapter presents procedures of this research project, including, research questions, research design, sample selection, survey instrument, pilot study, data collection, and data analysis.

Research Questions

In this study, the following research questions were answered:

1. What are the levels of knowledge and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination among selected Russian college students?
2. What are the levels of HBM constructs (perceived susceptibility, perceived severity, perceived barriers and perceived benefits) and HBM mediating factors (cues to action, and self-efficacy) regarding to the HPV, HPV-related diseases, and HPV vaccination among Russian college students?
3. Do differences exist in knowledge, perceptions, and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination based on gender?

4. How much variance in behavioral intention regarding the HPV vaccination can be accounted for by other HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge?

Research Design

A quantitative, cross-sectional, descriptive, and correlational survey design was used in this study. Quantitative research is based on deductive reasoning and attains data represented by numbers (Neuman, 2003). It provided the benefits of capability to measure quantities and magnitudes with the mathematical or statistical manipulations for the interpretation of the findings (Alreck & Settle, 2004). In this study, cross-sectional research allowed snapshotting insights of the problems of interest (HPV, HPV-associated diseases, HPV vaccination) presenting the information about the frequencies and characteristics of the particular health issues at a certain point in time. Also, it provided evidence for making relevant health decisions and creating effective programs for the population under study (Creswell, 1994; Sarvela & McDermott, 1993). Descriptive research allowed systematical, factual, and accurate description of the facts, conditions, characteristics, and attributes of a given population or areas of interest, based on measurement of a sample (Alreck & Settle, 2004; Isaac & Michael, 1995). Correlational research allowed to determine "the extent to which variations in one factor corresponds with variations in one or more other factors based on correlation coefficient" (Isaac & Michael, 1995, p. 53). In this study, it allowed to determine the relationships among HBM constructs and mediating factors regarding the HPV, HPV-associated diseases, and HPV vaccination. The survey research method provided multiple advantages because the purpose of the investigation was specified, a population was determined, a sample was selected and

systematically questioned (Alreck & Settle, 2004). The findings were analyzed, generalized to the relevant population, and reported to answer research questions and met purpose of the study (Alreck & Settle, 2004). Therefore, the chosen research design was appropriate for the purpose of the conducted study.

The following independent variables were studied: gender, age, marital status, educational level, sexual behavioral experiences, knowledge regarding the HPV, HPV-attributed diseases, and HPV vaccination and HBM constructs that include perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action regarding HPV, HPV-attributed diseases, and HPV vaccination. A new HBM construct added by the author, behavioral intention regarding HPV vaccination, served as a dependent variable.

Sample

The population included all 18-26 years old college students, enrolled full-time at Yaroslav-the-Wise Novgorod State University (NovSU), Veliky Novgorod, Russia from December 2011 through April 2012. The following general standards of sample size determination for the health sciences were used to identify the sample size for this study:

1. Alpha-level of significance (probability level) was set at 0.05 which means the confidence level is set at 95% (5% chance of making type I error or false positive result);
2. Power of statistical test (1-β) is set at 0.80 which means 20% chance of making type II error or false negative result;
3. Effect size range is set between 0.20 to 0.40 (measure of the strength of the relationship between two variables)

By looking at Polit and Hungler's (1995) table for the sample size identification, the minimum sample size for the present study was established as 200 participants. To ensure receiving 200 fully-completed surveys, large oversampling was recommended by dissertation committee to be applied by inviting a sample of 1,200 students for participation. Sampling was done through simple random sampling method using the SQL statement "ORDER BY NEWID ()" propriety of Microsoft algorithm out of the total student population (N=9.923) at Yaroslav-the-Wise Novgorod State university using registrar's office data.

Survey Instrument

An existing self-report questionnaire, *HPV Study Survey,* was adapted with permission from the author (Kahn, et al., 2005; Kahn, et al., 2008; Shikarya, et al., 2009; Wetzel1, et al., 2007). The following psychometric characteristics of the original survey were reported by the author: "knowledge about HPV and HPV vaccines was measured using a 12-item scale that we developed in a previous study (Wetzel1, et al., 2007); the exploratory factor analysis using the 32 items measuring beliefs and attitudes identified 10 factors, or subscales, that were used in subsequent analyses" (Kahn, et al., 2008, p.1106). Other psychometric characteristics of the original survey (Kahn, et al., 2008) are presented in Table 3.

To meet the purposes of the study, the existing instrument had to be adapted and modified. Also, it was expanded to include items pertained to males and items inquiring about not only about genital warts and cervical cancer but about other HPV-associated cancers too.

Table 3

Cronbach Alpha of the Original Instrument

Construct	Number of items	Cronbach alpha
Beliefs that influential people in one's life would approve of vaccination	4	.82
Barriers to vaccination related to safety	4	.82
Practical barriers related to vaccination	5	.66
Barriers related to insufficient knowledge of HPV	2	.79
Benefits of vaccination related to health and safety	4	.82
Benefits of vaccination related to protection of oneself and one's partner from HPV	2	.65
Severity of HPV-related disease	3	.75
Severity of HPV infection	2	76
Susceptibility to HPV	2	.77
Fear of shots in general	4	.79
HPV-related stigma	21	.96
Belief in one's ability to receive the vaccine	3	.82

Face and content validity of the instrument was established through a panel of experts on instrument development, behavior change models, sexuality education, and measurement. Modifications of the questionnaire were conducted after receiving the instrument reviews from the experts and feedback from dissertation committee chair. If all content experts agreed to retain an item, it was kept without any modifications. If at least two of the content experts recommended to delete an item, it was eliminated. If at least two of the content experts proposed that the item needed revisions, it was revised according to the experts' comments pertaining to

the item. The existing survey needed to be edited to include items relevant for males, eliminate questions that would not be applicable to Russian population, and exclude items that had no informational value for the present study. The original instrument was comprised of 139 items. Items about religious preferences, participation in previous HPV studies, cigarette smoking perceptions and behaviors, Pap tests, pregnancy, childbirth, division on main and other sexual partners were excluded as not applicable to males in general or the Russian population, and having no informational value for proposed study. The items about HPV-associated cancers, such as oral and throat, anal, and penile cancers were added taking into account previous research findings on HPV-associated diseases. According to the evaluation feedback from the content experts, items about cervical cancer and penile cancer were asked only specifically to relevant genders.

The revised survey instrument (107 items) used multiple choice, dichotomized items and forced-choice items, and Likert-type scale items. Appendix A contains the English version and Appendix B contains the Russian version of the revised instrument. Appendix C provides a list of knowledge, behavior, and demographic items in the survey instrument. Appendix D provides a list of items measuring HBM constructs in the survey instrument.

To ensure the accuracy of the Russian version of the survey instrument and cover letter for the participants, a translation-back-translation procedure was implemented. The revised survey instrument and cover letter were translated into Russian by the researcher and a Russian medical interpreter with subsequent retranslation back into English by another interpreter who specialized in Russian/English languages. English retranslations of the instrument and cover letter were compared with original English versions. Russian translations were discussed and all

discrepancies were resolved by reaching an agreement about the best fitting options in the Russian language.

The format of the actual survey was created by *SurveyMonkey*™ survey software where the option to separate participants on the bases of gender was used by creating internal links in the main body of the survey; however, the items and ranking system, as well as the instructions were the same as presented in Appendices A and E for the English version and Appendix B and F for the Russian version. The cover letter included brief information about the purpose of the survey, guidelines for survey completion, and voluntary and anonymous basis of participation. In *SurveyMonkey*™, by reading the cover letter and pressing the continue button, participants provided informed consent for participation. The cover letter with instruction and the consent for the participants are attached as Appendices E and F.

Pilot Study

Human Subjects Committee of Southern Illinois University Carbondale (SIUC) and Scientific Research Provost of Yaroslav-the-Wise Novgorod State University (NovSU) approvals were obtained for the pilot study before data collection began (Appendices G and H). The main purposes of the pilot study were to test the cover letter, data collection procedure, and internal consistency reliability of the adapted and expanded instrument. Seventy-five participants were contacted by NovSU registrar's office through e-mails using simple random sampling method using the SQL statement "ORDER BY NEWID" propriety of Microsoft algorithm out of the total student population (9,923 students). The survey was distributed through *SurveyMonkey*™ survey software that was activated first two weeks of October 2011. After the first week of the initial launching of the survey only 10 participants completed it. E-mail-

reminders were sent to increase response rate. By the end of the second week of the data collection, 61 students replied to the survey (81.33% response rate) and 56 participants (74.67%) fully completed it. The completed surveys were transferred from *SurveyMonkey*™ software to Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010).

Internal consistency reliability was established by calculating Cronbach's alpha for the HBM constructs subscales and knowledge subscale (Table 4). Kuder-Richardson test for the knowledge subscale was KR21 score of 0.77 and KR20 score of 0.83.

Table 4

Cronbach Alpha of the Adapted Instrument

Construct	Number of items	Cronbach alpha
Perceived susceptibility	10	.70
Perceived severity	31	.92
Perceived barriers	13	.79
Perceived benefits	7	.85
Self-efficacy	5	.87
Cues to action	11	.93
Knowledge	12	.83

The instrument and data collection procedure appeared to be sound for the purpose of this study. A cover letter for the proposed study was modified directing those students who participated in the pilot study not to proceed taking survey for the second time.

Data Collection

Human Subjects Committee of Southern Illinois University Carbondale and Scientific Research Provost of Yaroslav-the-Wise Novgorod State University approvals were obtained for the main study before data collection began. An electronic questionnaire, administered through Survey *SurveyMonkey*™, was posted for the data collection purposes soliciting subjects pool through initially through e-mails. Dillman, Smyth, & Christian (2009), in their book *Internet, Mail, and Mixed-mode Surveys': The Tailored Design Method* serving as golden standard for web-based surveys, emphasized that e-mailing invitations and reminders for the survey purposes is well established method of data collection because e-mailing is cheap and can be delivered to the whole sample at once. Subsequent reminders were launched in the early morning hours in two, four, six, and eight weeks after the initial posting. According to Cook, Heath, and Thompson (2000), numerous reminders sent to the web-survey subjects pool is considered to be the ultimate approach in busting rates of responses to electronic questionnaire. Dillman, Smyth, & Christian (2009), stated that there is evidence showing that e-mail invitations and reminders delivered to the potential subjects pool in the early mornings have been most effective to elicit responses.

One thousand two hundred participants were contacted by the Yaroslav-the-Wise Novgorod State University (NovSU) registrar's office through e-mails using simple random sampling method with SQL statement "ORDER BY NEWID" propriety of Microsoft algorithm out of the total student population (N=9,923). The survey was distributed through SurveyMonkey™ survey software that was activated in December 2011. After six weeks of the initial launching of the survey, in spite of two reminders sent by e-mails in two and four weeks after the initial contact, only 38 participants answered the survey. Based on, recommendations

from Dillman, Smyth, & Christian (2009), to contact subjects pool using another method, as appropriate, the author proposed to contact the same population of participants through two Internet-based social networks (i.e., Facebook © and VKontakte ©) to increase response rate. This additional venue of data collection was approved by the dissertation committee and by SIUC Human Subjects Committee as well as an extension of time. Invitations to participate in this study were sent through the messaging system of two social network sites with subsequent reminders two, four, six, and eight weeks after the initial contact. Interestingly, that in this study, data collection through adding Internet-based social networks (Facebook © and VKontakte ©) messaging invitations increased initial response rate in 4.4 times compared to e-mailing invitations at the initial launching of the survey. It helped to reach the targeted population at their most popular hangout and communication/socializing place. By the end of the data collection period, 270 students replied to the survey (22.5% response rate). Data were electronically gathered and organized. Data were stored in the data set, using a Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010) spreadsheet and reported in aggregate form. Upon investigation completion, surveys and an electronic version of data will be stored in a locked file cabinet at SIUC and destroyed three years after data collection.

Data Analysis

Parametric statistics were used because the assumption was made that sample was normally distributed. Additionally, non-parametric chi-square test for dichotomized items was used. Descriptive and inferential statistics were calculated through the Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010). Each individual survey item underwent calculation of frequencies, percentages, measure of central tendency (mean), and

measures of dispersion (standard deviation). T-tests were conducted to examine differences in knowledge, perceptions, and behavioral intention, and sexual behaviors based on participants' genders. Gender was chosen as grouping variable because previous research recommended studying both genders and their differences on test variables. Since HPV vaccine was approved for males 3 years later than for females, males' knowledge, perceptions, and behaviors were assumed to be different from females. Chi-square test was used for dichotomized items on sexual behavior scale to investigate differences in those behaviors based on respondents' gender. Multiple regression was performed to test how much variance in behavioral intention regarding the HPV vaccination could be accounted for by HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge. The probability levels were set at 0.05. According to Peat, Mellis, Williams, and Xuan (2002), 0.05 probability level is recommended and used in a majority of health science research.

The following coding procedures were applied for data analysis. For the descriptive statistic analysis responses on the Likert-type scales were coded as follows: *strongly agree* = 4, *somewhat agree* = 3, *somewhat disagree* = 2, and *strongly disagree* = 1. Coding was reversed for some items. For multiple regression, item responses on the Likert-type scales was summed to create total scores. This procedure was verified at statistical laboratory at SIUC. Items within HBM constructs' each subscale and knowledge subscale were summed to create total scores. Table 5 presents the summary of the data analysis procedures congruent with research questions.

Table 5

Data Analysis Summary

Research Questions	Items	Analysis Methods
1. What are the levels of knowledge and behaviors regarding the HPV, HPV- related diseases, and HPV vaccination among selected Russian college students?	54-65; 97-107	Measure of central tendency (mean), measure of dispersion (standard deviation), and frequencies as appropriate
2. What are the perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action, and self-efficacy regarding to the HPV, HPV-related diseases, and HPV vaccination among Russian college students?	2-53; 66-85; 87-91;	Measure of central tendency (mean); measures of dispersion (standard deviation), and frequencies
3. Do differences exist in knowledge, perceptions, and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination based on gender?	54-65; 97-107	T-tests and Chi-square test for dichotomized items
4. How much variance in behavioral intention regarding the HPV vaccination can be accounted for by other HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy, and cues to action) and knowledge?	2-53; 66-85; 87-91	Multiple regression Dependent variable – behavioral intention Independent variables -- perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy, cues to action, and knowledge
Demographic items	1, 86, 92-96	Frequencies

Summary

This chapter presented procedures of this research. Four research questions pertained to the purpose of the study were stated. The appropriate research design including sampling, data collection, and data analysis procedures was described in details. Findings of the pilot study that tested cover letter and data collection procedure, and established internal consistency reliability of the adopted and expanded instrument were reported. The instrument and data collection procedure appeared to be sound for the purpose of the conducted study.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to explore multiple factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students. A secondary purpose of this study was to determine the relationships among HBM constructs and mediating factors regarding the HPV, HPV-associated diseases, and HPV vaccination. A tertiary purpose of this research was to determine which factors were most important when considering who will/will not seek HPV vaccination. This chapter presents results of this study, including the description of the study sample and findings organized by the research questions.

Description of Study Sample

The study sample consisted of 1,200 university students, 270 students replied to the survey (22.5% response rate) and 117 participants fully completed it (43.33% completion rate). There were several causes of missing data: some of the targeted sample chose not to participate in this study and some of the participants chose not to provide answers to several or more items. Demographic information of the participants is presented in Table 6. The participants' average age was 19.1 years (*SD*=1.6). The participants were represented by 54.7% of females and by 45.3% of males. Most participants (70.1%) were not married, 12.8% of participants were married (officially not registered), 11.1% of participants were married (officially registered), and 6.0% of participants were divorced, separated, or widowed. Minority of the participants (27.4%) were living with partner. All participants (100%) completed a high school or higher education. Almost equal percentages of participants were not sure that they had health insurance coverage (44.4%) or, indeed, had health insurance coverage (40.2%). Only 13 participants (11.1%) indicated that

Table 6
Demographics of the participants (N=117)

Variable	*n* (%)
Gender	
Female	64 (54.7)
Male	53 (45.3)
Mean age (SD)	19.1 (1.6)
Marital Status	
Never married	82 (70.1)
Divorced, separated, or widowed	7 (6.0)
Married (officially registered)	13 (11.1)
Married (officially not registered)	15 (12.8)
Currently living with partner	
Yes	32 (27.4)
No	85 (72.6)
Highest level of education	
9th grade	0 (0.0)
High school graduate	101 (86.3)
Community college	6 (5.1)
College/University degree	10 (8.5)
Graduate degree	0 (0.0)
Health insurance coverage	
Yes	47 (40.2)
No	18 (15.4)
Not sure	52 (44.4)
Ever received all three doses of HPV vaccine	
Yes	13 (11.1)
No	88 (75.2)
Not sure	16 (13.7)

they received all three doses of the HPV vaccine, while 16 participants (13.7%) were not sure if they received this immunization, and the majority of participants 88 (75.2%) did not receive all three doses of the HPV vaccine.

Results by Research Questions

1. What are the levels of knowledge and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination among selected Russian college students?

The participants' levels of knowledge on individual items regarding the HPV, HPV-related diseases, and HPV vaccination are presented in Table 7. Overall, average knowledge levels were moderate (6.63 correct answers out of maximum 12.00). Both males (6.33) and females (6.77) have shown moderate knowledge scores. Looking at individual knowledge items, most participants answered correctly to the three following items: a person may be infected with HPV and not know it (40.2%); HPV can be spread from person to person just by skin to skin genital contact (sexual contact without penetration) (44.4%); and women with HPV may need to get Pap tests more often than those without HPV (53.0%). Forty one percent of participants answered incorrectly to: Genital warts always go away permanently if you get the right treatment. Seven out of 12 items elicited "not sure" answers from participants: if a woman's male sexual partners use condoms, she is protected against HPV (39.3%); if a woman's male sexual partners use condoms, he is protected against HPV (39.3%); if a man's male sexual partner uses condoms, both are completely protected against HPV (39.3%); most women with HPV have problems with their menstrual periods (47.9%); HPV infection is often found or detected by a Pap test (48.7%); and HPV infection can cause problems getting pregnant (45.3%). One item elicited equal percentage of incorrect and "not sure" responses from participants: HPV can sometimes be cured with antibiotics (39.3% respectively).

Table 7

Participants' levels of knowledge regarding the HPV, HPV-related diseases, and HPV vaccination (N=117)

Item	Correct answer n (%)	Incorrect answer n (%)	Not sure n (%)
If a woman's male sexual partners use condoms, **she** is protected against HPV	27 (23.1)	44 (37.6)	46(39.3)
If a woman's male sexual partners use condoms, **he** is protected against HPV	33 (28.2)	38 (32.5)	46(39.3)
If a man's male sexual partner uses condoms, **both** are completely protected against HPV	28 (23.9)	43 (36.8)	46(39.3)
A person may be infected with HPV and not know it	47 (40.2)	26 (22.2)	44(37.6)
Most women with HPV have problems with their menstrual periods	22 (18.8)	39 (33.3)	56(47.9)
HPV can be spread from person to person just by skin to skin genital contact (sexual contact without penetration)	52 (44.4)	16 (13.7)	49(41.9)
HPV infection is often found or detected by a Pap test	49 (41.9)	11 (9.4)	57(48.7)
HPV infection can cause problems getting pregnant	18 (15.4)	46 (39.3)	53(45.3)
Genital warts always go away permanently if you get the right treatment	24 (20.5)	48 (41.0)	45(38.5)
HPV can sometimes be cured with antibiotics	25 (21.4)	46 (39.3)	46(39.3)
Women with HPV may need to get Pap tests more often than those without HPV	62 (53.0)	14 (12.0)	41(35.0)
Girls and women who have received an HPV vaccine don't need Pap tests anymore	33 (28.2)	48 (41.0)	36(30.8)

Participants' behaviors on individual items regarding their sexual practices are presented in Tables 8a-8d. The majority of participants were sexually active: 76.1% had **sexual contact** (sexual contact was defined as genital, skin-to-skin contact only) and 65.8% had **sex** (sex was defined as oral, vaginal, or anal sex) (see Table 8a). For all participants, the mean age of initiation of **sexual contact** and **sex** were 16.69 years old (*SD*=1.63) and 17.05 years old (*SD*=1.44) respectively (see Table 8b). Most participants initiated **sexual contact** when they were 17 years old (38.2%). The earliest initiation of **sexual contact** was at the age of 10 and latest was at the age of 24. Most participants initiated **sex** when they were 18 years old (41.6%).The earliest initiation of **sex** was at the age of 13 and latest was at the age of 24. Among the 77 participants who had sex (by sex meant oral, vaginal, or anal sex), the mean number of sexual partners during their lifetime was 2.60 (*SD*=3.30) and in past three months was 1.05 (*SD*=1.00) (see Table 8c). The majority of participants (70.1%) had sex only with one partner during their lifetime and most participants (50.6%) had sex only with one partner in the past three months. The highest numbers of sexual partners during their lifetime were reported by two participants: 20 and 22. The lowest number of sexual partners in the past three months was zero and the highest number of sexual partners in the past three months was 10. Items asking participants' sexual practices showed that, in the past three months, the majority of participants (76.3%) did not have anal sex; more than half (55.9%) had oral sex; and the majority (64.4%) had vaginal sex (see Table 8a). Items inquiring about safer sex practices among sexually active participants, demonstrated that less than one third of them (30.5%) always used condoms with their sexual partner and 18.6% never used them (see Table 8d). More than half of participants (57.6%), however, used a condom last time they had sex with their sexual partner (see Table 8a).

Table 8a

Participants' sexual behaviors

Items	Yes n (%)	No n (%)
Have you ever had sexual contact? (*by sexual contact we mean genital, skin-to-skin contact only)* (N=117)	89 (76.1)	28 (23.9)
Have you ever had sex? (*by sex we mean oral, vaginal, or anal sex*) (N=117)	77 (65.8)	40 (34.2)
In the past 3 months, have you had ***anal*** sex? (N=59)	14 (23.7)	45 (76.3)
In the past 3 months, have you had ***oral*** sex? (N=59)	33 (55.9)	26 (44.1)
In the past 3 months, have you had ***vaginal*** sex? (N=59)	38 (64.4)	21 (35.6)
The last time you had sex with your sexual partner; did you use a condom? (N=59)	34 (57.6)	25 (42.4)

Table 8b

Participants' sexual behaviors

Items	n (%)	Mean Score	Standard Deviation
How old were you when you had sexual contact for the first time? (N=89)		16.69	1.63
10	1(1.1)		
13	2(2.2)		
14	1(1.1)		
15	1(1.1)		
16	25(28.1)		
17	34(38.2)		
18	21(23.6)		
19	3(3.4)		
24	1(1.1)		

Table 8b (continues)

Participants' sexual behaviors

Items	n (%)	Mean Score	Standard Deviation
How old were you when you had sex for the first time *(by sex we mean oral, vaginal, or anal sex)*? (N=77)		17.05	1.44
13	1(1.3)		
14	1(1.3)		
15	3(4.0)		
16	15(19.5)		
17	21(27.3)		
18	32(41.6)		
19	1(1.3)		
20	2(2.6)		
24	1(1.3)		

Table 8c

Participants' sexual behaviors

Items	n (%)	Mean Score	Standard Deviation
During your life, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex)*? (N=77)		2.60	3.30
1	54 (70.1)		
2	7 (9.1)		
3	2 (2.6)		
4	2 (2.6)		
5	1 (1.3)		
6	1 (1.3)		
8	2 (2.6)		
9	1 (1.3)		
10	2 (2.6)		
11	1 (1.3)		
15	2 (2.6)		
20	1 (1.3)		
22	1 (1.3)		

Table 8c (continues)

Participants' sexual behaviors

Items	n (%)	Mean Score	Standard Deviation
In the past 3 months, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex)*? (N=77)		1.05	1.00
0	18 (23.4)		
1	39 (50.6)		
2	13 (16.9)		
3	6 (7.8)		
10	1 (1.3)		

Table 8d

Participants' sexual behaviors

Items	Never n (%)	Rarely n (%)	Sometimes n (%)	Most of the time n (%)	Always n (%)	Mean Score	Standard Deviation
In the past 3 months, how often did you use condoms with your sexual partner? (N=59)	11 (18.6)	7 (11.9)	10(16.9)	13 (22.0)	18 (30.5)	3.49	1.50

2. What are the levels of HBM constructs (perceived susceptibility, perceived severity, perceived barriers and perceived benefits) and HBM mediating factors (cues to action, and self-efficacy) regarding to the HPV, HPV-related diseases, and HPV vaccination among Russian college students?

Participants' levels of perceived susceptibility on individual items regarding the HPV, HPV-related diseases are presented in Table 9. Participants' average level of perceived susceptibility regarding to the HPV, HPV-related diseases is low (24.08 out of 40.00). Related to the possibility of getting infected with HPV, one-third of participants strongly disagreed (35.9%) and one-fourth (26.5%) somewhat disagreed. However, one-fourth of participants (25.4%) strongly disagreed that they do not worry about the possibility of getting infected with HPV and one-fourth (24.8%) somewhat disagreed. Also, almost one-third of participants (32.5%) strongly disagreed that the possibility of getting genital warts concerned them and one-fourth (24.8%) somewhat disagreed. Only 35% of participants strongly agreed that the possibility of getting cervical (penile) cancer concerned them and one-fifth (21.4%) somewhat agreed. However, one-fourth of participants (25.4%) strongly disagreed that the possibility of getting cervical (penile) cancer concerned them. The same percentages of participants strongly agreed and strongly disagreed (29.1% and 29.9% respectively) that the possibility of getting anal cancer concerned them. Thirty two percent of participants strongly disagreed that the possibility of getting oral and/or throat cancer concerned them and one-fifth (21.4%) somewhat disagreed. Only one-fourth of participants (26.4%) strongly agreed that the possibility of getting oral and/or throat cancer concerned them.

Table 9

Participants' perceived susceptibility regarding the HPV and HPV-related diseases (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
Unprotected sex practices increase risk of getting HPV and other sexually transmitted diseases.	31 (26.5)	20 (17.1)	23 (19.7)	43 (36.8)	2.75	1.25
The possibility of getting cervical (penile) cancer concerns me	30 (25.4)	21 (17.9)	25 (21.4)	41 (35.0)	2.66	1.21
If I received three doses of HPV vaccine I am protected against HPV and HPV-associated diseases	33 (28.2)	21 (17.9)	28(23.9)	35 (29.9)	2.58	1.22
I don't worry about the possibility of getting infected with HPV*	30 (25.4)	29 (24.8)	26 (22.2)	32 (27.4)	2.51	1.15
The possibility of getting anal cancer concerns me	35 (29.9)	20 (17.1)	28 (23.9)	34 (29.1)	2.51	1.18
The possibility of getting oral and/or throat cancer concerns me	37 (31.6)	25 (21.4)	24 (20.5)	31 (26.5)	2.42	1.20
The possibility of getting genital warts concerns me	38 (32.5)	29 (24.8)	21(17.9)	29 (24.8)	2.38	1.17
The possibility of getting infected with HPV concerns me	42 (35.9)	31 (26.5)	21 (17.9)	23(19.7)	2.25	1.12
If I received one dose of HPV vaccine I am protected against HPV and HPV-associated diseases	46 (39.3)	30 (25.4)	24 (20.5)	17 (14.5)	2.00	1.05
If I received two doses of HPV vaccine I am protected against HPV and HPV-associated diseases	44 (37.6)	31 (26.5)	25 (21.4)	17 (14.5)	2.00	1.03

Note: * item with reverse coding; items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree = 1

The perceived susceptibility items regarding HPV and HPV-attributable disease after receiving HPV vaccination showed the following results: only 39.3% of participants strongly disagreed that they would be protected against HPV and HPV-related diseases after receiving one dose of the vaccine; approximately the same percentage of participants (37.6%) strongly disagreed that they would be protected against HPV and HPV-related diseases after receiving two doses of the vaccine; and, surprisingly, approximately almost the same percentages of participants strongly agreed and strongly disagreed (29.9% and 28.2% respectively) that they would be protected against HPV and HPV-related diseases after receiving three doses of the vaccine. Only 36.8% of participants strongly agreed that unprotected sex practices increased risk of getting HPV and other sexually transmitted diseases; but one-fourth (26.5%) strongly disagreed with that statement.

The levels of participants' perceived severity on individual items regarding the HPV, HPV-related diseases are presented in Table 10. Participants' average level of perceived severity regarding HPV, HPV-related diseases was high (76.59 out of 116.00). Only approximately one-third of participants strongly agreed that HPV increases their risk of the HPV-attributed diseases, such as genital warts (27.4%), cervical (penile) cancer (31.6%), and one-fourth of the participants strongly agreed that HPV increases their risk of anal cancer (25.6%), and oral and/or throat cancer (24.8%). Thirty five percent of participants strongly disagreed that people die from being infected with HPV and 27.4% somewhat disagreed. Only 26.5% of participants strongly disagreed and 27.4% somewhat disagreed that people can get very sick from infection with HPV. However, 35.9% of participants strongly agreed and 23.1% somewhat agreed that people who are infected with HPV do not have to worry about their health. At the same time, most of the participants strongly agreed that

Table 10

Participants' perceived severity regarding the HPV and HPV-related diseases (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
Anal cancer would be a serious health problem for me	25 (21.4)	14 (12.0)	15 (12.8)	63 (53.8)	3.14	1.22
Genital warts would be a serious health problem for me	19 (16.2)	18 (15.4)	27 (23.1)	53 (45.3)	3.11	1.09
Cervical (penile) cancer would be a serious health problem for me	24 (20.5)	23 (19.7)	21 (17.9)	49 (41.9)	2.90	1.19
People who are infected with HPV don't have to worry about their health*	21 (17.9)	27 (23.1)	27 (23.1)	42 (35.9)	2.85	1.12
Oral and throat cancer would be a serious health problem for me	38 (32.5)	17 (14.5)	13 (11.1)	49 (41.9)	2.65	1.40
If I were to have an HPV infection, I would not feel I could be open with others about my HPV infection	28 (23.9)	30 (25.6)	21(17.9)	38 (32.5)	2.64	1.18
HPV will increase my risk of cervical (penile) cancer	29 (24.8)	25 (21.4)	26 (22.2)	37 (31.6)	2.62	1.18
If I were to have an HPV infection, I would feel others think I am to blame for my HPV infection	30 (25.6)	30 (25.6)	23 (19.7)	34 (29.1)	2.52	1.19
HPV will increase my risk of genital warts	31 (26.5)	26 (22.2)	28 (23.9)	32 (27.4)	2.50	1.20
HPV will increase my risk of anal cancer	30 (25.6)	30 (25.6)	27 (23.1)	30 (25.6)	2.48	1.14
If I were to have HPV infection I feel others would avoid me because of my HPV infection	30 (25.6)	33 (28.2)	26 (22.2)	28 (23.9)	2.46	1.12

Table 10 (continued)

Participants' perceived severity regarding the HPV and HPV-related diseases (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
If I were to have HPV infection I feel others would be concerned they could catch HPV through contact like a handshake or eating food I prepare	30 (25.6)	30 (25.6)	28 (23.9)	29 (24.8)	2.45	1.13
If I were to have an HPV infection, I would fear someone telling others about my HPV infection without my permission	35 (29.9)	27 (23.1)	21 (17.9)	34 (29.1)	2.45	1.24
If I were to have an HPV infection, I would feel that I need to keep my HPV infection a secret	36 (30.8)	25 (21.4)	23 (19.7)	33 (28.2)	2.42	1.22
HPV will increase my risk of oral and/or throat cancer	34 (29.1)	28 (23.9)	26 (22.2)	29 (24.8)	2.41	1.17
People can get very sick from infection with HPV	31 (26.5)	32 (27.4)	27 (23.1)	27 (23.1)	2.40	1.11
If I were to have an HPV infection, I would have a greater need than usual for reassurance that others care about me	37 (31.6)	26 (22.2)	28 (23.9)	26 (22.2)	2.35	1.17
If I were to have an HPV infection, changes in my appearance would affect my social relationships*	38 (32.5)	23 (19.7)	29 (24.9)	27 (23.1)	2.32	1.18
If I were to have an HPV infection, because of the HPV infection, I would have a sense of being unequal in my relationships with others	32 (27.4)	29 (24.9)	38 (32.5)	18 (15.4)	2.30	1.01
If I were to have an HPV infection, I would feel lonely more often than usual	36 (30.8)	31 (26.5)	25 (21.4)	25 (21.4)	2.27	1.12
If I were to have an HPV infection, others would feel awkward and tense when they are around me	32 (27.4)	38 (32.5)	22 (18.8)	25 (21.4)	2.26	1.08

Table 10(continued)

Participants' perceived severity regarding the HPV and HPV-related diseases (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
If I were to have HPV infection, some family members would reject me because of my HPV infection	43 (36.8)	28 (23.9)	19 (16.2)	27 (23.1)	2.16	1.19
People die from being infected with HPV	41 (35.0)	32 (27.4)	21(17.9)	23 (19.7)	2.12	1.12
If I were to have HPV infection, I would be treated with less respect than usual by others	42 (35.9)	28 (23.9)	27 (23.1)	20 (17.1)	2.08	1.08
If I were to have an HPV infection, I would feel I am at least partially to blame for my HPV infection.	46 (39.3)	24 (20.5)	29 (24.9)	18 (15.4)	2.06	1.08
If I were to have an HPV infection, I would feel set apart from others who are well	45 (38.5)	22 (18.8)	30 (25.6)	20 (17.1)	2.06	1.05
If I were to have HPV infection some people would act as though I am less competent (capable) than usual	46 (39.3)	24 (20.5)	24 (20.5)	23 (19.7)	2.02	1.14
Due to the HPV infection, I would sometimes feel useless	47 (40.2)	26 (22.2)	27 (23.7)	17 (14.5)	2.00	1.05
If I were to have an HPV infection, some friends would reject me because of my HPV infection	48 (41.0)	27 (23.1)	21 (17.9)	21 (17.9)	1.97	1.10
If I were to have an HPV infection, I would feel less competent (capable) than I did before my HPV infection	55 (47.0)	21 (17.9)	24 (20.5)	17 (14.5)	1.92	1.12
If I were to have HPV infection I feel others would discriminate against me	54 (46.2)	23 (19.7)	23 (19.7)	17 (14.5)	1.87	1.09

Note: * items with reverse coding; items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree = 1

HPV-associated diseases would be serious health problems for them: 45.3% in the case of genital warts, 41.9% in the cases of cervical (penile) and oral/throat cancers, and 53.8% in the case of anal cancer. However, some participants strongly disagreed that genital warts (16.2%), cervical (penile) cancer (20.5%), anal cancer (21.4%), and oral/throat cancer (32.5%) would be serious health problems for them.

Also, some participants strongly disagreed that certain perceived social consequences related to being infected with HPV would have impact on them. Nearly half of participants (46.2%) strongly disagreed that if they were to have HPV infection others would discriminate against them and more than one-third (35.9%) strongly disagreed that if they were to have HPV infection others would treat them with less respect than usual. Interestingly, almost equal percentages of participants strongly disagreed (25.6%), somewhat disagreed (25.6%), somewhat agreed (23.9%) and strongly agreed (24.8%) that if they were to have HPV infection they felt others would be concerned they could catch HPV through contact, like a handshake or eating food they prepared. Almost the same pattern of answers was noticed when the participants approximately equally split their opinions about if they were to have HPV infection, they felt others would avoid them: 25.6% strongly disagreed, 28.2% somewhat disagreed, 22.2% somewhat agreed, and 23.9% strongly agreed. However, more than one-third of participants strongly disagreed that if they were to have HPV infection, some family members and some friends would reject them (36.8% and 41.0% respectively). At the same time, over one-fourth of participants (27.4%) strongly disagreed and third of participants (32.5%) somewhat disagreed. that if they were to have HPV infection, others would feel awkward and tense around them

Less than one-third of participants (29.1%) strongly agreed and 19.7% somewhat agreed that if they were to have HPV infection, they would be blamed by others for getting it; however,

the same percentages (25.6%) each strongly disagreed and somewhat disagreed. Interestingly, most of participants (39.3%) strongly disagreed and one-fifth (20.5%) somewhat disagreed that if they were to have HPV infection, they would at least partially blame themselves. One- third of participants (32.5%) strongly agreed that if they were to have HPV infection, they could not be open with others about it; however, one-fourth (25.6%) somewhat disagreed. Interestingly, the same percentages of participants (29.9%) strongly agreed and strongly disagreed that if they were to have HPV infection, they would fear that someone would tell others about their HPV infection without their permission. Almost the same percentages of participants disagreed and strongly agreed (strongly 30.8% and 28.2% respectively) that if they were to have HPV infection, they would need to keep their HPV infection a secret.

Nearly four of ten participants (38.5%) strongly disagreed that if they were to have HPV infection, they would feel set apart from others who were well; however, one-fourth (25.6%) somewhat agreed. Nearly one-third of participants (31.6%) strongly disagreed and 22.2% somewhat disagreed that if they were to have HPV infection, they would have a greater need than usual for reassurance that others cared about them; but the same percentage strongly agreed with that statement. Less than one-third of participants (30.8%) strongly disagreed and one-fourth (26.5%) somewhat disagreed that if they were to have HPV infection, they would feel lonely more often than usual. At the same time, one-third of participants (32.5%) somewhat agreed that if they were to have HPV infection, they would feel unequal in their relationships with others, but 27.4% strongly disagreed. Most respondents (39.3%) strongly disagreed that if they were to have HPV infection, some people would act as though they are less competent (capable) than usual and 47.0% strongly disagreed that they themselves would feel less competent (capable) than before they got infected with HPV. Forty percent of participants

strongly disagreed that if they were to have HPV infection, they would sometimes feel useless. One-third participants (32.5%) strongly disagreed that if they were to have HPV infection, changes in their appearance would affect their social relationships, but almost one-fourth (23.1%) strongly agreed with that statement.

Levels of participants' perceived barriers on individual items regarding the HPV vaccination are presented in Table 11. Participants' average level of perceived barriers regarding to the HPV vaccine was moderate (33.13 out of 52). One-fifth of participants (21.4%) strongly disagreed that shots were very painful and 36.0% somewhat disagreed. However, only less than one-third of participants (30.9%) strongly disagreed that needles do not bother them and 22.2% somewhat disagreed, but one-fourth (25.6%) strongly agreed. Furthermore, one-third of participants (33.3%) strongly disagreed and 22.2% somewhat disagreed that they were not afraid of shots, but 28.2% strongly agreed.

A little over one-fourth of participants (28.2%) strongly agreed and 39.3% somewhat agreed that HPV vaccine shots could lead to serious side effects. One-third of participants (34.2%) strongly agreed and 45.3% somewhat agreed that HPV vaccine can make people very sick. Furthermore, half of participants (49.6%) strongly agreed and one-fourth (25.6%) somewhat agreed that one could be infected with HPV from the HPV vaccine shots.

Less than one third of participants (30.8%) strongly agreed and one-fourth (25.6%) somewhat agreed that it would be hard for them to find time to get vaccinated for HPV. In addition, 38.5% of participants strongly agreed and one-fourth (24.8%) somewhat agreed that it would be hard for them to get transportation for three appointments to get vaccinated for HPV.

Table 11

Participants' perceived barriers regarding the HPV vaccination (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
One can get infected with HPV from the HPV vaccine shots	15 (12.8)	14 (12.0)	30 (25.6)	58 (49.6)	3.14	1.05
The HPV vaccine can make people very sick	11 (9.4)	13 (11.1)	53 (45.3)	40 (34.2)	3.08	.88
Asking for the HPV vaccine would be embarrassing	24 (20.5)	23 (19.7)	18 (15.4)	52 (44.4)	2.88	1.21
HPV vaccine shots can lead to serious side effects	17 (14.5)	21 (17.9)	46 (39.3)	33 (28.2)	2.85	.98
It will be hard for me to get transportation for 3 appointments to get vaccinated for HPV	25 (21.4)	18 (15.4)	29 (24.8)	45 (38.5)	2.82	1.17
It will be hard for me to find time to get vaccinated for HPV	25 (21.4)	26 (22.2)	30 (25.6)	36 (30.8)	2.66	1.12
It will be easy for me to get to a clinic for the 3 shots of HPV vaccine*	34 (29.1)	23 (19.7)	23 (19.7)	37 (31.6)	2.53	1.22
Needles don't bother me at all *	36 (30.8)	26 (22.2)	25 (21.4)	30 (25.6)	2.42	1.17
I am not afraid of shots *	39 (33.3)	25 (21.4)	20 (17.1)	33 (28.2)	2.41	1.22
Shots are very painful	25 (21.4)	42 (36.0)	28 (23.9)	22 (18.8)	2.40	1.02
The HPV vaccine is too expensive for me	45 (38.5)	30 (25.6)	25 (21.4)	17 (14.5)	2.08	1.07
Deciding whether I should get vaccine would be difficult without knowing more about HPV	54 (46.1)	27 (23.1)	19 (16.2)	17 (14.5)	1.95	1.12
Deciding whether I should get the vaccine would be difficult without knowing more about the vaccine	63 (53.8)	17 (14.5)	21 (17.9)	16 (13.7)	1.86	1.10

Note: * items with reverse coding; items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree = 1

Interestingly, nearly one-third of participants (31.6%) strongly agreed that it would be easy for them to get to a clinic for the three shots of HPV vaccine, but 29.1% strongly disagreed with that statement. Surprisingly, 38.5% of participants strongly disagreed that the HPV vaccine was too expensive for them and one-fourth (25.6%) somewhat disagreed. Forty four percent of participants strongly agreed that asking for the HPV vaccine would be embarrassing. Interestingly, 46.1% of participant strongly disagreed and 23.1% somewhat disagreed that deciding whether they should get vaccine would be difficult without knowing more about HPV. Furthermore, more than half of participants (53.8%) strongly disagreed that deciding whether they should get the vaccine would be difficult without knowing more about the vaccine.

Levels of participants' perceived benefits on individual items regarding the HPV vaccination are presented in Table 12. Participants' average level of perceived benefits regarding to the HPV vaccine was low (17.68 out of 28). Less than one-third of participants (29.1%) strongly disagreed and one-fourth (24.8%) somewhat disagreed that getting vaccine shots against HPV would be a good way to protect their health; however, one-fourth (25.6%) strongly agreed with that statement. Similarly, less than one-third of participants (29.1%) strongly disagreed and one-fifth (20.5%) somewhat disagreed that that one way for them to stay healthy would be to get the vaccine shots to prevent infection with HPV; however, one-fourth (26.5%) strongly agreed with that statement. Only one-third of participants (33.3%) strongly agreed that HPV vaccine would protect them against cervical (penile) cancer and, interestingly, equal percentage (22.2%) somewhat agreed, somewhat disagreed, and strongly disagreed with that statement.

Table 12

Participants' perceived benefits regarding the HPV vaccination (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
The HPV vaccine will protect me against cervical (penile) cancer	26 (22.2)	26 (22.2)	26 (22.2)	39 (33.3)	2.69	1.16
The HPV vaccine will protect me against anal cancer	27 (23.1)	29 (24.8)	29 (24.8)	32 (27.4)	2.59	1.13
The HPV vaccine will protect me against genital warts	30 (25.6)	26 (22.2)	24 (20.5)	37 (31.6)	2.58	1.19
The HPV vaccine will protect me against oral and throat cancer	32 (27.4)	27 (23.1)	29 (24.8)	29 (24.8)	2.49	1.15
One way for me to stay healthy would be to get the vaccine shots to prevent infection with HPV	35 (29.9)	24 (20.5)	27 (23.1)	31 (26.5)	2.48	1.18
Getting vaccine shots against HPV would be a good way to protect my health	34 (29.1)	29 (24.8)	24 (20.5)	30 (25.6)	2.45	1.16
Getting the HPV vaccine would protect my sexual partner(s) against HPV infection	31 (26.5)	28 (23.9)	31 (26.5)	27 (23.1)	2.44	1.12

Note: items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree = 1

Less than one-third of participants (27.4%) strongly agreed that the HPV vaccine would protect them against anal cancer and, interestingly, almost equal percentages somewhat agreed, somewhat disagreed, and strongly disagreed (24.8%, 24.8%, and 23.1% respectively) with that statement. Furthermore, less than one-third of participants (27.4%) strongly disagreed that HPV vaccine would protect them against oral and throat cancer and, interestingly again, almost equal percentages somewhat disagreed, somewhat agreed, and strongly agreed (23.1%, 24.8%, and 24.8% respectively). Less than one-third of participants (31.6%) strongly agreed that HPV vaccine would protect them against genital warts; however, one-fourth (25.6%) strongly disagreed with that statement. Interestingly, equal percentage of participants (26.5%) strongly disagreed and somewhat agreed that getting the HPV vaccine would protect their sexual partner(s) against HPV infection and almost equal percentages somewhat disagreed and strongly agreed (23.9% and 23.1% respectively) with that statement.

Levels of participants' self-efficacy on individual items regarding the HPV vaccination are presented in Table 13. The participants' average level of self-efficacy regarding to the HPV vaccine was high (7.63 out of 12). Less than one-third of participants (29.9%) strongly agreed and 23.1% somewhat agreed that that they were confident that getting HPV vaccine could help them to stay healthy; however, one-fourth (25.6%) strongly disagreed. Interestingly, equal percentage of the participants (25.6%) strongly agreed, somewhat agreed, and strongly disagreed that they could find the time to go to their health care provider for three visits to get vaccinated against HPV. Nearly three of ten participants (28.2%) strongly agreed and one-fifth (20.5%) somewhat agreed that that they were confident that they could afford to get vaccinated against HPV (be able to pay for the three vaccine shots).

Table 13

Participants' self-efficacy regarding the HPV vaccination (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
I am confident that getting HPV vaccine could help to stay healthy	30 (25.6)	25 (21.4)	27 (23.1)	35 (29.9)	2.61	1.18
I am confident that I could afford to get vaccinated against HPV (be able to pay for the three vaccine shots)	30 (25.6)	30 (25.6)	24 (20.5)	33 (28.2)	2.54	1.17
I am confident that I could find the time to go to your health care provider for three visits to get vaccinated against HPV	30 (25.6)	27 (23.1)	30 (25.6)	30 (25.6)	2.49	1.14

Note: items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree = 1

Levels of participants' cues to action on individual items regarding the HPV vaccination are presented in Table 14. The participants' average level of cues to action regarding the HPV vaccination was moderate (28.31 out of 44). One-third of participants (35.9%) strongly agreed and one-fifth (20.5%) somewhat agreed that they would get HPV vaccine if their doctor suggested them getting it. Furthermore, nearly one-third of participants (31.6%) strongly agreed and 23.1% somewhat agreed that they would get HPV vaccine if their parents wished them getting it; however, one-fourth (25.6%) strongly disagreed. On the other hand, almost one-third of participants (31.6%) strongly disagreed and one-fourth (26.5%) somewhat disagreed that they would get HPV vaccine if their partner (or future partner if they do not have one now) would suggest they get it. Twenty eight percent of participants somewhat agreed and one-fifth (21.4%) strongly agreed that that they would get HPV vaccine if their friends suggested them getting it; however, almost equal percentages of other participants strongly disagreed and somewhat disagreed (25.6% and 24.8% respectively) with that statement. Twenty eight percent of participants somewhat agreed and 26.5% strongly agreed that most people they know thought that HPV vaccine was good for one's health.

Interestingly, about one-third of participants strongly disagreed and strongly agreed (35% and 31.6% respectively) that if someone in their family had cervical (penile) cancer, they would get HPV vaccine. Almost equal percentages of participants strongly disagreed, somewhat disagreed, somewhat agreed, and strongly agreed (24.8%, 27.4%, 25.6, and 22.2% respectively) that if someone in their family had anal cancer, they would get HPV vaccine. Almost the same pattern of answers were reported on the item stating that if someone in the participants' family had oral/throat cancer, they would get HPV vaccine: 26.5% strongly disagreed, 28.2% somewhat disagreed, 23.9% somewhat agreed and 21.4% strongly disagreed.

Table 14

Participants' cues to action regarding the HPV vaccination (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
I will get HPV vaccine if my doctor suggests me to get it	28 (23.9)	23 (19.7)	24 (20.5)	42 (35.9)	2.72	1.20
I will get HPV vaccine if my parents wish me to get it	30 (25.6)	23 (19.7)	27 (23.1)	37 (31.6)	2.63	1.20
Most people I know think that HPV vaccine is good for your health	27 (23.1)	26 (22.2)	33 (28.2)	31 (26.5)	2.61	1.11
I will get HPV vaccine if my friends suggest me to get it	30 (25.6)	29 (24.8)	33 (28.2)	25 (21.4)	2.45	1.09
If someone among my friends had anal cancer, I will get HPV vaccine	29(24.8)	32 (27.4)	30 (25.6)	26 (22.2)	2.45	1.08
If someone in my family had cervical (penile) cancer, I will get HPV vaccine	41 (35.0)	21 (17.9)	18 (15.4)	37 (31.6)	2.41	1.31
If someone among my friends had oral and/or throat cancer, I will get HPV vaccine	31 (26.5)	33 (28.2)	28 (23.9)	25 (21.4)	2.37	1.09
If someone in my family had oral and/or throat cancer, I will get HPV vaccine	44 (37.6)	21 (17.9)	19 (16.2)	33 (28.2)	2.32	1.28
If someone in my family had anal cancer, I will get HPV vaccine	42 (35.9)	25 (21.4)	23(19.7)	27 (23.1)	2.29	1.27
I will get HPV vaccine if my partner (or a future partner if I don't have on now) suggests me to get it	37 (31.6)	31 (26.5)	28(23.9)	21 (17.9)	2.28	1.10
If someone among my friends had cervical (penile) cancer, I will get HPV vaccine	44 (37.6)	24 (20.5)	22 (18.8)	27 (23.1)	2.22	1.20

Levels of participants' behavioral intention on individual items regarding the HPV vaccination are presented in Table 15. The average level of participants' behavioral intention regarding the HPV vaccination was low (4.74 out of 8). Almost equal percentages of participants somewhat agreed and strongly disagreed (29.1% and 28.2% respectively) that they will be vaccinated against HPV next year. Furthermore, almost equal percentages of participants strongly disagreed and somewhat agreed (29.1% and 26.5% respectively) that they will get vaccinated completely against HPV (that is, get all three vaccine shots).

3. Do differences exist in knowledge, perceptions, mediating factors, behavioral intention, and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination based on gender?

T-tests of knowledge, perceptions, mediating factors, behavioral intention, and behaviors subscales regarding the HPV, HPV-attributable diseases, and HPV vaccination based on gender are presented in Table 16 and Chi-square tests of dichotomized behavioral items based on gender are presented in Table 17. There were no statistically significant differences between males and females in total knowledge, perceived severity, perceived benefits, self-efficacy, cues to action, and majority of behavioral items. There were statistically significant differences between males and females in perceived susceptibility, perceived barriers, behavioral intention, and in two behavioral items. Males showed higher levels (25.37; p= .01) to HPV and HPV-associated diseases and compared to females (22.93). Males showed higher perceived levels of barriers (34.21; p=.02) towards HPV vaccination compared to females (32.28). Females showed higher levels of behavioral intention (5.08; p=.02) towards getting HPV vaccine and compared to males (4.41).

Table 15

Participants' behavioral intention regarding the HPV vaccination (N=117)

Items	Strongly Disagree n(%)	Somewhat Disagree n(%)	Somewhat Agree n(%)	Strongly Agree n(%)	Mean Score	Standard Deviation
I am confident that I will get vaccinated completely against HPV (that is, get all three vaccine shots)	34 (29.1)	25 (21.4)	31 (26.5)	27 (23.1)	2.42	1.14
I am confident that I will get vaccinated against HPV next year	33 (28.2)	28 (23.9)	34 (29.1)	22 (18.8)	2.34	1.07

Note: * items with reverse coding; items were coded strongly agree = 4, somewhat agree = 3, somewhat disagree = 2, and strongly disagree =1

Table 16

T-test of Knowledge, Perceptions, Mediating Factors, Behavioral Intention, and Behaviors Subscales Regarding the HPV, HPV-attributable Diseases, and HPV Vaccination Based on Gender

	n (%)	Mean	Standard Deviation	t	df	95% confidence interval of the difference	
			Knowledge				
Females	64 (45.3)	6.77	2.97	-.47	115	-2.34	1.46
Males	53 (54.7)	6.33	3.04				
			Perceived susceptibility				
Females	64 (45.3)	22.93	5.67	2.63*	115	.61	4.27
Males	53 (54.7)	25.37	7.00				
			Perceived severity				
Females	64 (45.3)	77.83	16.81	-.94	115	-7.85	2.78
Males	53 (54.7)	75.29	14.79				
			Perceived barriers				
Females	64 (45.3)	32.28	6.07	2.35*	115	.31	3.54
Males	53 (54.7)	34.21	6.20				
			Perceived benefits				
Females	64 (45.3)	17.14	5.82	1.60	115	-.28	2.67
Males	53 (54.7)	18.34	5.62				

Table 16 (continued)

T-test of Knowledge, Perceptions, Mediating Factors, Behavioral Intention, and Behaviors Subscales Regarding the HPV, HPV-attributable Diseases, and HPV Vaccination Based on Gender

	n (%)	Mean	Standard Deviation	t	df	95% confidence interval of the difference	
Self-efficacy							
Females	64 (45.3)	7.98	2.38	-2.00	115	-1.36	-.01
Males	53 (54.7)	7.29	2.43				
Cues to action							
Females	64 (45.3)	28.22	8.10	.12	115	-2.66	3.00
Males	53 (54.7)	28.39	9.77				
Behavioral intention							
Females	64 (45.3)	5.08	1.85	-2.49*	115	-1.20	.14
Males	53 (54.7)	4.41	1.91				
Behaviors							
How old were you when you had sexual contact for the first time?							
Females	40 (44.9)	17.2	1.62	-3.26**	87	-1.44	-.35
Males	49 (55.1)	16.3	1.54				
How old were you when you had sex for the first time (by sex we mean oral, vaginal, or anal sex)?							
Females	31 (40.3)	17.4	1.62	-2.74*	75	-1.17	.19
Males	46 (59.7)	16.8	1.21				
During your life, with how many partners have you had sex (by sex we mean oral, vaginal, or anal sex)?							
Females	31 (40.3)	2.17	2.19	1.44	75	-.30	1.88
Males	46 (59.7)	3.00	4.00				
In the past 3 months, with how many partners have you had sex (by sex we mean oral, vaginal, or anal sex)?							
Females	31 (40.3)	.89	.59	1.70	75	-.05	.61
Males	46 (59.7)	1.17	1.22				
In the past 3 months, how often did you use condoms with your sexual partner?							
Females	22 (37.3)	3.41	1.49	.56	57	-.35	.64
Males	37 (62.7)	3.56	1.52				

Note: *p<.05; **p<.01.

Table 17

Chi-square test of Dichotomized Items on Behaviors Subscale Based on Gender

	n %		χ^2	df
	Yes	No		
Have you ever had sexual contact? (by sexual contact we mean genital, skin-to-skin contact only) (N=117)				
Females	33 (28.2)	23 (19.7)	7.11*	1
Males	56 (47.9)	5 (4.3)		
Have you ever had sex? (by sex we mean oral, vaginal, or anal sex) (N=117)				
Females	32 (27.4)	23 (19.7)	1.53	1
Males	45 (38.5)	17 (14.5)		
In the past 3 months, have you had anal sex? (N=59)				
Females	4 (6.8)	17 (28.8)	.14	1
Males	10 (16.9)	28 (47.5)		
In the past 3 months, have you had oral sex? (N=59)				
Females	25(42.4)	16 (27.1)	3.05	1
Males	8 (13.6)	10 (16.9)		
In the past 3 months, have you had vaginal sex? (N=59)				
Females	8 (13.6)	12 (20.3)	1.70	1
Males	30 (50.8)	9 (15.3)		
The last time you had sex with your sexual partner; did you use a condom? (N=59)				
Females	9 (15.3)	13 (22.0)	.1.16	1
Males	25 (42.4)	12 (20.3)		

Note: *p<.05

More males (47.9%; p=.01) than females (28.25) had sexual contact (by sexual contact was meant genital, skin-to-skin contact only). Males had sexual contact for the first time earlier being 16.3 years old (p<.01) than females being 17.2. Males had sex for the first time earlier being 16.8 years old (p=.01) than females being 17.4.

4. How much variance in behavioral intention regarding the HPV vaccination can be accounted for by HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and cues to action) and knowledge?

Pearson correlation analysis among behavioral intention regarding the HPV vaccination and HBM constructs is presented in Table 18. Statistically significant correlations were found between behavioral intention and perceived barriers, perceived benefits, cues to action, and self-efficacy; between perceived susceptibility and perceived severity, perceived benefits, and cues to action; between perceived severity and perceived barriers; between perceived barriers and perceived benefits, cues to action, and knowledge; between perceived benefits and cues to action; between self-efficacy and cues to action. Behavioral intention was statistically significant and moderately positively correlated to perceived barriers (r=.43, p=.01), perceived benefits (r=.37, p=.03), and cues to action (r=.51, p<.01). Behavioral intention was statistically significant and strongly positively correlated to self-efficacy (r=.80, p<.001). Perceived susceptibility was statistically significant and moderately positively correlated to perceived severity (r=.39, p=.02), perceived benefits (r=.33, p=.04), and cues to action (r=.53, p<.01). Perceived severity was statistically significant and moderately negatively correlated to perceived barriers (r=-.47, p=.01). Perceived barriers were statistically significant and moderately strong positively correlated to perceived benefits (r=.56, p<.01), cues to action (r=.52, p<.01), and knowledge (r=.42; p=.01). Perceived benefits were statistically significant and strongly positively correlated

to cues to action (r=.80, p<.001). Self-efficacy was significantly and moderately positively correlated to cues to action (r=.35, p=.04).

Table 18

Pearson Correlation Analysis Between Behavioral Intention Regarding the HPV Vaccination and Other HBM Constructs and Knowledge (N-117)

	Susceptibility	Severity	Barriers	Benefits	Self-efficacy	Cues to action	Knowledge
Behavioral intention	*-.14*	*-.12*	*.43**	*.37**	*.80****	*.51***	*-.02*
Susceptibility		*.39**	*.03*	*.33**	*-.17*	*.53***	*.18*
Severity			*-.47***	*.15*	*-.05*	*.08*	*-.17*
Barriers				*.56***	*.23*	*.52***	*.42**
Benefits					*.16*	*.80****	*.18*
Self-efficacy						*.35**	*-.15*
Cues to action							*.19*

Note: *p<.05; **p<.01; ***p<.001

Multiple regression analysis of variance in behavioral intention regarding the HPV vaccination accounted for by HBM constructs is presented in Table 19. Seventy-five percent (r^2=.75) of the variance in behavioral intention getting HPV vaccination could be explained by perceived susceptibility, severity, barriers, benefits, self-efficacy, cues to action, and knowledge. Self-efficacy was the only HBM construct which significantly predicted (p=. p<.01) behavioral intention to get HPV vaccination.

Table 19

Multiple Regression Analysis of Variance in Behavioral Intention Regarding the HPV Vaccination Accounted for by Other HBM Constructs and Knowledge (N=117)

Model	B	Beta	T
R^2		.75	
Perceived susceptibility	-.11	-.24	-1.38
Perceived severity	.01	.04	.25
Perceived barriers	.04	.14	.69
Perceived benefits	-.01	-.02	-.08
Self-efficacy	.49	.61	4.12*
Cues to action	.08	.34	1.34
Knowledge	.00	.00	.02

Note: a. Dependent variable behavioral intention; b. * $p<.01$.

Summary

This chapter presented the results of the study, including a description of the study sample, demographic information of the participants, and results by research questions using outputs of the statistical analysis such as the measure of central tendency (mean), measure of dispersion (standard deviation), frequencies, t-tests, chi-square test, Pearson's correlation test, and linear multiple regression of variance.

CHAPTER V

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Introduction

The purpose of this research was to explore multiple factors related to HPV, HPV-associated diseases, and HPV vaccine among Russian college students. A secondary purpose of this study was to determine the relationships among HBM constructs and mediating factors regarding the HPV, HPV-associated diseases, and HPV vaccination. A tertiary purpose of this research was to determine which factors were most important when considering who will/will not seek HPV vaccination.

In spite of the availability of HPV vaccination on the market for females for past six years and for males for past three years, the rate of HPV vaccination among Russian population remains low. Lack of awareness and affordability of the HPV vaccination contribute to scarcity of implementation of this particular vaccine among Russian women and men (WHO, 2008). Due to the importance of this vaccine for prevention of HPV-associated diseases, such as cervical, penile, anal, vulvo-vaginal, oral and throat cancers, and genital warts (Anhang, Goodman, & Goldie, 2004; Bosch & de Sanjose, 2003; CDC, 2006b; Shin et al., 2004; The Digene HPV Test, 2009; WebMD, 2009), all female and male students should have evidence-based and solid knowledge about the HPV vaccination, should have unproblematic access to HPV vaccination, and should be able to get vaccinated appropriately.

The following research questions were answered in this study:

1. What are the levels of knowledge and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination among selected Russian college students?

2. What are the levels of HBM constructs (perceived susceptibility, perceived severity, perceived barriers and perceived benefits) and HBM mediating factors (cues to action, and self-efficacy) regarding to the HPV, HPV-related diseases, and HPV vaccination among Russian college students?
3. Do differences exist in knowledge, perceptions, and behaviors regarding the HPV, HPV-related diseases, and HPV vaccination based on gender?
4. How much variance in behavioral intention regarding the HPV vaccination can be accounted for by other HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge?

A quantitative, cross-sectional, descriptive, and correlational survey design was used in this study. An existing self-report questionnaire *HPV Study Survey* was adapted with acquired permission from the author (Kahn, et al., 2005; Kahn, et al., 2008; Shikarya, et al., 2009; Wetzel1, et al., 2007) and, also, it was expanded to include items pertained to males and items inquiring about not only genital warts and cervical cancer, but also about other HPV-associated cancers too.

To achieve the research purposes and to answer research questions, Russian female and male college students at Yarslav-the-Wise Novgorod State University (NOVSU), Veliky Novgorod, Russia presented a suitable population. The population was all 18-26 years old college students, enrolled full-time at Yaroslav-the-Wise Novgorod State University (NovSU), Veliky Novgorod, Russia during December 2011 – April 2012 (N=9,923). Sampling (n=1200) was done through simple random sampling method using the SQL statement “ORDER BY NEWID” propriety of Microsoft algorithm out of the total student population at NovSU using registrar’s office data.

The Human Subjects Committee of SIUC and Scientific Research Provost of NovSU approvals were obtained for this study before data collection began. An electronic questionnaire, administered through *SurveyMonkey™,* was distributed for data collection purposes through e-mails and internet social networks messages. Subsequent reminders were launched in the morning hours in two, four, six, and eight weeks after the initial e-mailing and messaging invitations to participate in the survey.

Parametric statistics and non-parametric chi-square test for dichotomized items were calculated through the Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010), as appropriate. Each individual survey item underwent calculation of frequencies, percentages, measures of central tendency (mean), and measures of dispersion (standard deviation). T-tests were conducted to examine differences in knowledge, perceptions, behavioral intention, and sexual behaviors based on participants' genders. Chi-square test was used for dichotomized items on sexual behavior scale to investigate differences in those behaviors based on participants' gender. Multiple regression was performed to test how much variance in behavioral intention regarding the HPV vaccination was accounted for by HBM constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy and cues to action) and knowledge. Probability levels were set at 0.05.

Conclusions

This research provided findings about knowledge, perceptions, and behaviors of Russian college students regarding HPV, HPV-attributed diseases, and HPV vaccination through exploration of multiple factors related to HPV, HPV-associated diseases, and HPV vaccine. Also, this study determined the relationship among HBM constructs regarding the HPV, HPV-

associated diseases, and HPV vaccination. Finally, this research identified factors which were most important when considering who will/will not seek HPV vaccination.

1. Data collection through internet-based social networks messaging seemed to be more effective than e-mailing invitations. This finding suggested that this modern data collection venue has a promising potential for research and potentially health intervention purposes in youth population.
2. The HPV vaccination rate among Russian college students was low.
3. Overall knowledge levels among Russian college students were low and were consistent with previous research investigating knowledge/awareness about HPV, HPV-related diseases, and HPV vaccination among American college youth, and male and female adults.
4. Most Russian college students were sexually active; age of initiation of sexual contacts and sex was similar to American college students. The majority of Russian college students had only one sexual partner during their lifetime. Also, sexual practices of Russian college students were reported as being more "classical" engaging primarily in vaginal and oral sex compared to various sexual activities practiced by other population. The majority of Russian college students habitually practice sex without condom, even though more than half of them reported that the last time they had sex with their sexual partner they used a condom.
5. Levels of perceptions, such as susceptibility, barriers, and benefits among Russian college students regarding HPV, HPV-associated diseases, and HPV vaccination were low; only perceived severity of HPV and HPV-related diseases was higher.
6. Levels of mediating factors, such as self-efficacy and cues to action regarding HPV vaccintion among Russian college students were moderate.

7. Level of behavioral intention of Russian college regarding the HPV vaccination was statistically significantly low.
8. There were no statistically significant differences between Russian males and females in total knowledge, perceived severity, perceived benefits, self-efficacy, cues to action, and majority of behavioral items. There were statistically significant differences between Russian males and females in perceived susceptibility, perceived barriers, behavioral intention, and in two behavioral items. Russian males showed statistically significant higher perceived susceptibility to HPV and HPV-associated diseases and higher perceived barriers HPV vaccination compared to females. Russian females showed statistically significant higher behavioral intention towards getting HPV vaccine.
9. Sexual behaviors of Russian college students showed some differences bases on gender. For example, statistically significantly more Russian males indicated that they have had sexual contact (by sexual contact was meant genital, skin-to-skin contact only) and had first sexual contact and sex earlier compared to Russian females. These findings showed both genders similar to the sexual activity patterns of college students from the U.S.
10. Relationships among HBM constructs regarding HPV, HPV-associated diseases, and HPV vaccination revealed the following associations that were consistent with previous research that used HMB in HPV, HPV-attributable diseases, and HPV vaccination studies. Statistically significant correlations were found between behavioral intention and perceived barriers, perceived benefits, cues to action, and self-efficacy; between perceived susceptibility and perceived severity, perceived benefits, and cues to action; between perceived severity and perceived barriers; between perceived barriers and perceived benefits, cues to action, and knowledge; between perceived benefits and cues to action; between self-efficacy and cues to action.

11. HBM constructs (perceived susceptibility, severity, barriers, benefits, self-efficacy, and cues to action) and knowledge played a major role in explaining the variance in behavioral intention getting HPV vaccination among Russian college students. Self-efficacy was the only HBM construct which statistically significantly predicted behavioral intention to get HPV vaccination among Russian college students.
12. These research findings provided useful information for understanding what Russian students at a typical average size public university know about HPV, HPV-associated disease, and HPV vaccination, their levels of perceptions regarding this topic of exploration, and their sexual behaviors. These findings could be generalized to the NOVSU population of students from whom study sample was drawn.
13. This study presents a foundation for the development and implementation of national and regional HPV vaccination programs.

Discussion

HPV vaccination is one of the great achievements of the 21st century in women's and men's health. One more public health victory could be achieved by creating awareness and accessibility of the HPV vaccination among college students. Cervical cancer screening programs (regular gynecological exams with Pap smear test), the HPV vaccination, early detection, and treatment of HPV infection and cervical cancer will have an ultimately positive influence on the female population individually and overall public health. Other HPV-related cancers (oral/throat, anal, and penile) could be prevented through HPV immunization providing health enhancing benefits for both genders. This is the first time in history of medicine and public health when cancer could be prevented through vaccination of individuals.

Data Collection

In this study, the response rate to the on-line survey was acceptable but low (22.5%) when compared to typical average response rate of 33% indicated by Nulty (2008) with variation from 20% to 47% in nine studies that this author reviewed. Limitation in the data collection by e-mailing the sample to achieve adequate response rate lead to the application of a supplementary data collection method. Interestingly, data collection improved significantly adding message invitations through Internet-based social networks (Facebook © and VKontakte ©). The initial response rate increased 4.4 times compared to e-mailing invitations at the initial launching of the survey. It helped to reach the targeted sample at their most popular hangout and communication/socializing place. This finding suggested a new modern effective data collection venue for reaching college youth for research and potentially for health intervention purposes, including educational efforts and skill building training using existing social networks applications.

Demographics of Russian College Students

The demographic data reflected the population from which the subjects were randomly selected: males and females 18-26 years old, single, and graduates from high school or higher education. There were 9,923 full-time students enrolled at NOVSU during the Fall 2011 and Spring 2012 semesters. Among them 3,473 (35%) were males and 6,450 (65%) were females (Educational Student Department, 2012). The respondents who fully completed survey were represented by 64 (54.7%) of females and by 53 (45.3%) of males. Participants' average age was 19.1 years which corresponds to the third-year college students in five-year bachelors programs. Most participants (70.1%) were never married; the typical marriage age of Russian population was reported by Alih (2009) being 26.1 years for males and 23.3 years for females. The minority

of the participants (27.4%) were living with partner, typically Russian college students continue to live with their parents due to the unaffordability of independent housing or living in the university dormitories for singles. All respondents (100%) completed a high school or higher education which is also requirement to be admitted to the university. Health insurance coverage is typically provided by university for all full-time enrolled students for free. However, this study showed that more than half of the respondents (55.6%) were not aware about this benefit. However, HPV vaccination is not included as a routine childhood immunization or covered by federally-provided universal insurance in Russia. The HPV vaccination rate among participants reflected the overall pattern of the HPV vaccination in Russia as being low. There were only 13 participants (11.1%) who indicated that they received all three doses of the HPV vaccine. Only regionally-funded programs showed high HPV immunization up-take, such as the HPV vaccination project in Moscow region that showed, in 11 months of its implementation HPV immunization, up-take among 12-13 years old girls was 68% (Krasnopolsky, Zarochentseva, Serova, Bulychyova, & Belaya, 2010). However, these regionally-funded programs do not target college youth; priority populations for such programs is teenagers.

Knowledge of Russian College Students Regarding HPV, HPV-Related Diseases, and HPV Vaccination

Accepting the need for protection against HPV requires relevant knowledge, high perceptions of threat (susceptibility and severity), benefits outweighing barriers, influential cues to action, and strong self-efficacy regarding to HPV, HPV-attributed diseases, and HPV vaccine. Overall, the average knowledge levels among Russian college students were moderately low (6.63 out of maximum 12.00). Both males (6.33) and females (6.77) showed moderate knowledge scores. Looking at individual knowledge items, most of the respondents answered

only to three items correctly (a person may be infected with HPV and not know it; HPV can be spread from person to person just by skin to skin genital contact (sexual contact without penetration); and women with HPV may need to get Pap tests more often than those without HPV). Lack of factual knowledge on this topic among Russian college students included the following items: To what extent sexual partners are protected against HPV if they use condoms; Whether HPV causes problems with menstrual periods or with getting pregnant in women who acquired this sexually transmitted infection; How HPV infection can be often detected and treated; and Whether females who have received the HPV vaccine will not need Pap tests anymore. These findings were consistent with previous research about knowledge levels of the HPV vaccination targeted populations, including college students (Allred, Shaw, Santibanez, Rickert, & Santoli, 2005; Boehner, Howe, Bernstein, & Rosenthal, 2003; McPartland, Weaver, Lee, & Koutsky, 2005; Pitts & Clarke, 2002; Waller et al., 2003; Zimmerman, 2006). Breaking myths and reinforcing evidence-based facts about HPV, HPV-related diseases, and HPV vaccination could increase anticancer awareness among females and males and motivate them to receive the HPV vaccine.

Sexual Behaviors of Russian College Students

Participants' behaviors regarding their sexual activity showed that the majority of participants were sexually active: 76.1% have had sexual contact (sexual contact was defined as genital, skin-to-skin contact only) and 65.8% have had sex (sex was defined as oral, vaginal, or anal sex). Specifically, the average age to initiate sexual contact and sex among participants was 16.7 years old and 17.1 years old respectively. Often participants initiated sexual contact when they were 17 years old (38.2%) and initiated sex when they were 18 years old (41.6%). These findings were similar to American, Canadian, and European youth sexual activity patterns who

on average, had sex for the first time when they were17 years old (Chandra, Martinez, Mosher, Abma, & Jones, 2005; Martinez, Chandra, Abma, Jones, Mosher, 2006; Reissing, Andruff, & Wentland, 2012; Tsui & Nicholadis, 2004; Wellings et al., 2001). Recent data from 2011 Youth Risk Behavior Survey showed that less than half (47.4%) of 15-17 years old American youth have had sexual intercourse, and only 6.2% had sex for the first time before age 13 (CDC, 2012b). Thus, findings of this study suggest that the HPV vaccination programs targeting Russian youth at the high-school and college levels could be very promising in creating high immunity in these groups because young people could receive HPV vaccine before becoming sexually active (age of high-school graduates are 16-17 years old, which is the same age when the majority of Russian youth enter universities and colleges). HPV vaccination could provide full benefit and protection from carcinogenic (types 16, 18) and warts-causing (types 6, 11) types of HPV for those who had never engaged in sexual contacts or intercourse. Furthermore, majority of participants reported having one sexual partner during their life and for the past three months (70.1% and 50.6% respectively). Items asking participants about their sexual practices showed that Russian college students practiced mostly oral (55.9%) and vaginal sex (64.4%) in the past three months. These are routes of typical transmission of the HPV infection if persons are engaging in unsafe sex practices (not using dental dams and condoms). Thus, Russian college students could be exposed to warts and cancer-causing types of the HPV as well as other sexually transmitted infections. Taking this fact into account, it was alarming to find that less than one-third of participants (30.5%) always used condoms with their sexual partners and 18.6% never used them. More than half of participants (57.6%), however, reported that they used a condom the last time they had sex with their sexual partner. A minority of Russian college students regularly use condoms compared to American college students. The 2005 National

College Health Assessment showed that 54% of American college students regularly use condoms during vaginal intercourse, 29 % during anal intercourse, and only 4 % during oral sex (American College Health Association, 2006). The 2011 Morbidity and Mortality Weekly Report showed even higher condom use among sexually active American high-school students: 65.5% reported that they used a condom the last time they had sex with their sexual partner (CDC, 2011c). However, inconsistency of condom use for vaginal and anal sex was reported my many researchers (CDC, 2003; De Visser, 2007; Flannery, Ellingson, Votaw, & Schaefer, 2003; Grello, Welsh, & Harper, 2006; Gullette & Lyons, 2006; Laska, Pasch, Lust, Story, & Ehlinger, 2009). No items inquired about dental dam use or specification for use of condoms for vaginal, oral, or anal sex in the present study, but these investigations can be incorporated in future research.

Perceived Susceptibility of Russian College Students Regarding HPV and HPV-attributed Diseases

Levels of participants' perceived susceptibility regarding the HPV and HPV-related diseases was low (24.08 out of 40.00). This finding is consistent with previous research that showed youth as perceiving themselves not vulnerable to sexually transmitted diseases, including HPV and HPV-associated diseases. It appears they do not consider long-term consequences of their behaviors (American Psychological Association (APA), 2012; Kahn et al., 2007; Kimmel, 2006; United Nations Population Fund (UNFPA), n.d.;). Only a little more than one-third of participants (36.8%) strongly agreed that unprotected sex practices increased risk of getting HPV and other sexually transmitted diseases and, furthermore, one-fourth participants (26.5%) strongly disagreed with that statement. Only one-fifth of participants (19.7%) strongly agreed that the possibility of getting infected with HPV concerned them. These results are even lower

than those reported by Mullins et al. (2010), Ramirez, Ramos, Clayton, Kanowitz, and Moscicki (1997), Yacobi, Tennant, Ferrante, Pal, and Roetzheim, (1999) who reported that only 21% to 46% of youth perceived themselves as being susceptible to HPV. Only one-fourth of participants (24.8%) strongly agreed that the possibility of getting genital warts concerned them; only one-third participants (35%) strongly agreed that getting cervical (penile) cancer concerned them; less than one-third of participants (29.1%) strongly agreed that getting anal cancer concerned them; and only one-fourth of participants (26.4%) strongly agreed that getting oral and/or throat cancer concerned them.

Perceived susceptibility after receiving HPV vaccination showed that after receiving three doses of the vaccine only less than one-third of participants (29.9%) strongly agreed that they would be protected against HPV and HPV-related diseases. This finding contradicts the previous study done by Basu, Chapman, and Galvani (2008) who stated that perceived susceptibility of cervical cancer and genital warts was significantly lower in the participants who received HPV vaccine. According to Kahn et al. (2007), pediatricians were concerned about HPV susceptibility in youth and when compared to boys, girls were regarded as a higher risk group for HPV and HPV-associated diseases. Russian pediatricians have youth, including college students, as their patients until the age 18 in Russian healthcare system and general practitioners provide health care to the youth 18 years of age and older.

Perceived Severity of Russian College Students Regarding HPV and HPV-associated Diseases

Participants' average level of perceived severity regarding to HPV, HPV-related diseases was high (76.59 out of 116.00). However, only a little more than one-fourth of participants (27.4%) strongly agreed that HPV increases their risk of HPV-attributed diseases, such as genital

warts (27.4%), cervical (penile) cancer (31.6%), and one-fourth of participants strongly agreed that HPV increases their risk of anal cancer (25.6%), and oral and/or throat cancer (24.8%). This finding supports previous research that showed that youth are not concerned by long-term consequences, which could be detrimental to their health status (Kahn et al., 2007; Kimmel, 2006). Only one-fifth of participants (19.7%) strongly agreed that people die from being infected with HPV and only 23.1% of participants strongly agreed that people can get very sick from infection with HPV. This finding showed that very few college students perceive HPV as an illness that could lead to serious health-altering consequences. Furthermore, a little more than one-third of the respondents (35.9%) strongly agreed that people who are infected with HPV did not have to worry about their health.

However, most participants (45.7%) strongly agreed that HPV-associated diseases would be serious health problems for them: 45.3% in the case of genital warts, 41.9% in the cases of cervical (penile) and oral/throat cancers, and 53.8% in the case of anal cancer. Findings related to higher severity in the case of cervical (penile) cancer supported previous studies about perceived severity of cervical cancer by Anhang, Wright, Smock, and Goldie (2004), Hoover, Carfioli, and Moench (2000), Kahn, Rosenthal, Hamann, and Bernstein (2003), Kahn et al. (2005), Mays et al. (2000), and Mays, Sturm, and Zimet (2004b) that reported high perceived severity of this malignant disease in women. On the other hand, some participants strongly disagreed that HPV-attributed diseases would be a serious health problems for them: 16.2% in the case of genital warts, 20.5% in the case of cervical (penile) cancer, 21.4% in the case of anal cancer, and 32.5% in the case of oral/throat cancer. This finding could be explained by the fact that these college students did not comprehend the seriousness of HPV-related cancers or they did not have relatives or friends suffering from any type of cancer.

Many respondents agreed that certain perceived social consequences related to being infected with HPV would impact them. The following social negative attributes were not perceived as social severity problems by slightly more than one-third of the college students (35.3%): others would discriminate against them (46.2%), others would treat them with less respect than usual (35.9%), others would feel awkward around them (27.4%), or some family members (36.8%) and some friends (41.0%) would reject them because of this disease, they would have a greater need than usual for reassurance that others care about them, and they would feel lonely more often than usual (30.8%). These findings showed that the majority of Russian college students in this study would need increased social support in the case of being infected with HPV. Interestingly, participants almost equally split their choices (on average 25.0% per each choice) from strongly disagree, somewhat disagree, somewhat agree, to strongly agree in answering the following items: that if they were to have HPV infection they felt others would be concerned they could catch HPV through contact like a handshake or eating food they prepare and they felt others would avoid them. These findings indicated misperceptions among college students related to HPV transmission routes.

Interestingly, only 39.3% of participants strongly disagreed that if they were to have HPV infection, they would at least partially blame themselves and another one-fourth (25.6%) strongly disagreed that if they were to have HPV infection, they would be blamed by others for acquiring it. However, almost one-third of participants (29.1%) strongly agreed that if they were to have HPV infection, they would be blamed by others for acquiring it. These findings showed lack self-responsibility for acquiring HPV and also indicated the probability of partner-blaming attitude in college participants. Whether or not participants blamed their partners was not explored in this study. Less than one-third of college students (30.1%) strongly agreed that, in

the case of acquired HPV infection, keeping it as a secret, inability to be open with others about it, and fear that someone would tell others about it without permission of the infected person concerned them. These findings indicated that the majority of college students seemed to rely on loyalty and integrity of their social circles in the case of being infected with HPV. However, for some of them, it would not be safe to disclose their HPV status to others.

One third of participants (32.3%) disagreed that if they were to have HPV infection, they felt they would feel set apart from others who were well, or if changes in their appearance would affect their social relationships. About 30% of participants agreed that if they were to have HPV infection, they would feel unequal in their relationships with others. Thus, for majority of the college student, a certain level of social isolation presented a problem in the case of an acquired HPV infection, in spite of not feeling any inequality in the relationships with other people. On average, 42.1% of participants strongly disagreed that, in the case of the acquired HPV infection, some people would act as though they were less competent (capable) than usual, they themselves felt less competent (capable) than before they got infected with HPV, and they would sometimes feel useless. These findings suggest that for majority of the participants these personal and social consequences will be more or less problematic. Overall social severity consequences regarding HPV infection presented a problem for a majority of the college students.

Perceived Barriers of Russian Colleges Students Regarding HPV Vaccination

Participants' average level of perceived barriers regarding to the HPV vaccine was moderate (33.13 out of 52). Items inquiring about shots revealed that on average only one-fifth of participants (21.45%) somewhat and strongly agreed that shots were very painful; about one-fourth (26.5%) agreed that needles bothered them; and about another one-fourth (27.8%) agreed

that they are afraid of shots. These findings showed that generally perceptions about shots are not considered a barrier for the majority of Russian college students. Items inquiring specifically about HPV vaccination shots indicated that on average more than one-third of participants (37.1%) somewhat and strongly agreed that HPV vaccine shots could lead to serious side effects (28.8%), that HPV vaccine could make people very sick (39.8%), and that one can get infected with HPV from the HPV vaccine shots (37.6%). These findings suggest that some Russian college students recognize safety of HPV vaccination as an important consideration for receiving this immunization, which confirms previous research (Boehner, Howe, Bernstein, & Rosenthal, 2003; Binham, Drake, and LaMontagne, 2009; Brabin et al., 2008; Gerend, Lee, & Shepherd, 2006; Slomovitz et al., 2006; Woodhall et al., 2007). Misperceptions about adverse effects and safety aspects could reinforce negative perceptions and be a barrier for getting HPV vaccine shots.

On average less than one-third of participants (29.8%) strongly and somewhat agreed that it would be hard for them to find time to get vaccinated for HPV (28.2%), that it would be hard for them to get transportation for three appointments to get vaccinated for HPV (31.7%), that it will not be easy for them to get to a clinic for the three shots of HPV vaccine (24.4%). These findings showed that time, transportation, and necessity to come to clinic three times to receive HPV vaccination did not present barriers for this immunization for majority of Russian college students. Thus, these results are contradictory to previous studies that showed these factors as barriers for the HPV vaccination (Conroy et al., 2009; Kantor, 2007; Pollack, Balkin, Edouard, Cutts, & Broutet, 2007; Sankaranarayanan, 2009; Vetter & Geller, 2007). Even though this study showed that, for majority of Russian college students, cost of the HPV vaccine was a barrier to receive HPV immunization and it is consistent with previous studies stating the cost of the HPV

vaccines was the ultimate barrier to widespread immunization (Agosti and Goldie, 2007; Herzog, Huh, Downs, Smith, & Monk, 2008; Mortensen, 2010). Surprisingly, on average one-third of participants (32.1%) strongly and somewhat disagreed that the HPV vaccine was too expensive for them. These results indicated that there is a need to ensure and include health care insurance coverage for the HPV vaccination or expand free regional immunization programs.

Nearly half of participants (44.4%) strongly agreed that asking for the HPV vaccine would be embarrassing. This finding suggests that HPV vaccination could be perceived as a moral concern or personal/intimate matter. Factors which could contribute to feeling of embarrassment when asking about HPV immunization were not explored in this study. Surprisingly, only less than one-fifth of participants (15.6%) agreed that deciding whether they should get vaccine would be difficult without knowing more about HPV and without knowing more about the vaccine. These findings contradict previous research, which indicated that lack of awareness about HPV and HPV-attributed diseases created barriers for the acceptance of HPV immunization (Brewer, Ng, McRee, & Reiter, 2010; Fernandez et al., 2009; Larson, 2011; Reiter, Brewer, McRee, Gilbert, & Smith, 2010; Zimmerman, 2006).

Perceived Benefits of Russian College Students Regarding HPV Vaccination

Participants' average level of perceived benefits regarding to the HPV vaccine was low (17.68 out of 28). On average, less than one-fourth of participants (23.9%) strongly and somewhat agreed that getting vaccine shots against HPV would be a good way to protect their health and that one way for them to stay healthy would be to get the vaccine shots to prevent infection with HPV. These findings showed that perceived benefits of the HPV immunization for an overall health is very low in Russian college students. Only one-fourth of participants (26.2%)

agreed that the HPV vaccine would protect them against cervical (penile) (33.3%), anal (27.4%), and oral/throat (24.8%) cancers. These findings suggest that perceived benefits of the anticancer prevention of the HPV vaccination are very low in Russian college students. Furthermore, on average, less than one-third of participants (31.6%) strongly and somewhat agreed that the HPV vaccine would protect them against genital warts. This finding could be viewed in two aspects: first, perceived benefits of the anti-warts prevention of the HPV vaccination is very low in Russian college students or, second, this study did not clarify if by HPV vaccine was meant "Gardasil" (covers carcinogenic and warts-causing types of HPV) or "Cervarix" (covers only carcinogenic types of HPV). Previous studies showed lack of information about the benefits of the HPV vaccination (Mortensen, 2010; Dempsey, Zimet, Davis, & Koutsky, 2006; Gerend, Lee, & Shepherd, 2006). Interestingly, equal percentages of the participants (26.5%) strongly disagreed and somewhat agreed that getting the HPV vaccine would protect their sexual partner(s) against HPV infection and almost equal percentage of the participants somewhat disagreed and strongly agreed (23.9% and 23.1% respectively) with that statement. This finding indicated that perceived benefits of getting HPV immunization were not clear for Russian college students regarding benefits for their partner(s).

Self-efficacy of Russian College Students Regarding HPV Vaccination

Participants' average level of self-efficacy regarding to the HPV vaccine was moderate (7.63 out of 12). Consistent answer to the inquiry about the same topic items on self-efficacy subscale indicating that on average, only one-fourth of participants (26.5%) strongly and somewhat agreed that they were confident that getting HPV vaccine could help them to stay healthy. This finding suggested that there is a lack of confidence in Russian college students in

acceptance/adaptation of the HPV immunization as a mean to benefit their overall health. Interestingly, equal percentages of participants (25.6%) strongly agreed, somewhat agreed, and strongly disagreed that they could find time to go to their health care provider for three visits to get vaccinated against HPV, and 23.1% somewhat disagreed with that statement. This finding showed that Russian college students varied in their confidence level to undergo full HPV immunization due to inability to find time and come back to their health care providers for three vaccination appointments. This result confirmed previous studies that showed youth's failure to return for scheduled medical visits or failure to schedule subsequent visits to their health care provider for HPV vaccination (Conroy et al., 2009; Kantor, 2007). Only one-fourth of participants (24.4%) were confident that they could afford to get vaccinated against HPV (be able to pay for the three vaccine shots). This finding suggested that high cost of the HPV vaccine induces low confidence in Russian college students to be able to receive this immunization. This result was consistent with Mortensen's study (2010) that revealed that 18- to 22- year old males and females would be likely to receive HPV immunization if they did not have to pay for it out of their pocket.

Cues to Action of Russian College Students Regarding HPV Vaccination

Participants' average level of cues to action regarding the HPV vaccination was moderate (28.31 out of 44). Only one-fourth of participants (25.3%) agreed that they would get HPV vaccine if their doctor suggested them it, if their parents wanted them to get it, if their partner (or future partner if they do not have one now) suggested it, and if their friends suggested it. Among these important people in one's life, the highest regards were given to the doctor: more than one third of the participants (35.9%) strongly agreed that they would get HPV vaccine if their doctor

suggested it. A little more than one-fourth of the participants (27.4%) agreed that most people they know think that HPV vaccine is good for one's health. These findings suggest that external social influences as cues to action do not impact Russian college students in their decisions regarding getting HPV immunization. Thus, these findings contradict previous studies stating that parents influence and guide their children about vaccinations (Rosenthal & Stanberry, 2005; Poston, 2009; Vardeman, 2008). Since doctors had a higher regard for recommendations of the HPV immunization, they need to be ready to offer evidence-based information about HPV, HPV-associated diseases, and HPV vaccine to their patients which was also confirmed by Zimet (2005).

Personal experiences, such as having someone in the family or among friends who had HPV-related cancers as cues to action to get HPV immunization, showed unclear results. About two-thirds of participants strongly disagreed and strongly agreed (35% and 31.6% respectively) that if someone in their family had cervical (penile) cancer, they would get HPV vaccine. Almost equal percentages of participants strongly disagreed, somewhat disagreed, somewhat agreed, and strongly agreed (24.8%, 27.4%, 25.6, and 22.2% respectively) that if someone in their family had anal cancer, they would get HPV vaccine. Almost the same pattern of answers were reported on an item stating that if someone in participants' family had oral/throat cancer, they would get HPV vaccine: 26.5% strongly disagreed, 28.2% somewhat disagreed, 23.9% somewhat agreed and 21.4% strongly disagreed with that statement. These findings suggest that Russian college students did not relate family history or someone's personal experiences with HPV-attributed cancers (except cervical/penile cancers) as direct cues to action to get them immunized against HPV infection.

Behavioral Intention of Russian College Students Regarding HPV Vaccination

Participants' average level of behavioral intention regarding the HPV vaccination was low (4.74 out of 8). Only one-fourth of participants expressed behavioral intention (24.4%) to get vaccinated against HPV next year (24.0%) and to get vaccinated completely against HPV (that is, get all three vaccine shots) (24.8%). These findings suggest low levels of behavioral intention to receive HPV vaccination by Russian college students. These results confirmed previous research, which showed that college students often do not seek preventive healthcare and that is why it is more likely that they will not get HPV vaccination (Rose & Ayad, 2008; Woodwell & Cherry, 2004).

Differences in Knowledge, Perceptions, Mediating Factors, Behavioral Intention, and Behaviors Regarding the HPV, HPV-related Diseases, and HPV Vaccination Based on Gender

There were no statistically significant differences between males and females in total knowledge, perceived severity, and perceived benefits. Surprisingly, males showed statistically significantly higher perceived susceptibility levels to HPV and HPV-associated compared to females (p=.01). This finding was contradictory to three studies (*College Study, MSM study,* and *Minority Study)* reviewed by Daley et al. (2012) who stated that males showed low perceived susceptibility levels to HPV and HPV-related diseases. General medical opinion about the susceptibility to sexually transmitted infections considers females as being more susceptible compared to males due to the differences in anatomical structures of genitals. Russian female college students, however, did not perceive themselves susceptible to HPV. Males showed statistically significant higher levels of perceived barriers towards HPV vaccination compared to

females (p=.02). Since HPV vaccine was approved to immunize males more recently (2.5 years ago) compared to females, this finding suggested further exploration of barriers that could be more typical to the male population.

There were no statistically significant differences based on gender in mediating factors (i.e. self-efficacy and cues to action). Females showed statistically significant higher behavioral intention levels towards getting HPV vaccine compared to males (p=.02). This finding confirmed a previous study conducted by Kahn, Rosenthal, Hamann, and Bernstein (2003) that showed that most of young women who received questionnaires about the HPV vaccination expressed positive attitudes about it; that is, they were interested in getting the vaccination themselves and in immunizing their daughters.

Statistically significant more males indicated that they had sexual contact (by sexual contact was meant genital, skin-to-skin contact only) compared to females (47.9% and 28.25%; p=.01). Males' average age of having had sexual contact for the first time was statistically significantly younger compared females (16.3 and 17.2 respectively; p<.001). Also, males' average age of having had sex for the first time (by sex was meant vaginal, oral, or anal sex) was statistically significantly younger compared to females (16.8 and 17.4 respectively; p=.01). These findings suggest that males started to be sexually active earlier than females and could be more experienced in sexual contacts than females. Also, these findings showed the same sexual activity pattern as that of American college students (CDC, 2012b; Chandra, Martinez, Mosher, Abma, & Jones, 2005; Martinez, Chandra, Abma, Jones, Mosher, 2006). Other behavioral items did not reveal any statistically significant differences based on gender.

Relationships among HBM Constructs Regarding HPV, HPV-associated Diseases, and HPV Vaccination

Behavioral intention was statistically significantly and moderately positively correlated to perceived barriers (r=.43, p=.01), perceived benefits (r=.37, p=.03), cues to action (r=.51, p=.00), and self-efficacy (r=.80, p=.00). These findings were consistent with previous research that showed higher perceived benefits being associated with higher acceptance and intention of getting HPV vaccination (Davis, Dickman, Ferris, & Dias, 2004; Dempsey, Zimet, Davis, & Koutsky, 2006; Zimet et al., 2000; Zimet et al., 2005). In contrast, perceived barriers were associated with lower acceptance and intention of getting HPV vaccination (Boehner, Howe, Bernstein, & Rosenthal, 2003; Hoover, Carfioli, & Moench, 2000; Mortensen, 2010; Vetter & Geller, 2007). Other authors found that cues to action were associated with higher acceptance and intention of getting HPV vaccination (Boehner, Howe, Bernstein, & Rosenthal, 2003; Gerend, Lee, & Shepherd, 2006; Giuseppe et al., 2008; Kahn, Rosenthal, Hamann, & Bernstein, 2003; Mortensen, 2010; Zimet et al., 2000).

Perceived susceptibility was statistically significantly and moderately positively correlated to perceived severity (r=.39, p=.02), benefits (r=.33, p=.04), and cues to action (r=.53, p=.00). Perceived severity was significantly and moderately negatively correlated to perceived barriers (r=-.47, p=.01). These associations corresponded to the core mechanism of the HBM, because, according to Janz, Champion, and Skinner (2002), in general, people will adopt a new healthy behavior or product (in this case, HPV vaccine) 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 believed that the estimated barriers to (or cost of) taking the action are prevailed over by its benefits.

Perceived barriers were statistically significantly and moderately strong positively correlated to perceived benefits (r=.56, p=.00), cues to action (r=.52, p=.00), and knowledge (r=.42; p=.01). According to Janz, Champion, and Skinner (2002), perceived barriers to take action needed to be counterbalanced by perceived benefits of taking that action, which confirms the positive correlation between perceived benefits and barriers revealed in the present study. Additionally, Mortensen (2010), Dempsey, Zimet, Davis, and Koutsky (2006), and Gerend, Lee, and Shepherd (2006) showed that lack of awareness about the benefits of HPV vaccination is one of the barriers for targeted populations to receive this immunization. Perceived benefits were statistically significantly and strongly positively correlated to cues to action (r=.80, p=.00). Self-efficacy was statistically significantly and moderately positively correlated to cues to action (r=.35, p=.04). These findings confirmed previous research conducted by Boehner, Howe, Bernstein, and Rosenthal (2003), Davis, Dickman, Ferris, and Dias (2004), Dempsey, Zimet, Davis, and Koutsky (2006), Gerend, Lee, and Shepherd (2006), Giuseppe et al. (2008), Mortensen (2010), Zimet et al. (2005), and Zimet et al. (2000).

These findings suggest that behavioral intention could be increased by removing barriers, enhancing benefits, enforcing cues to action, and boosting self-efficacy of the HPV vaccine targeted populations. Perceived susceptibility could be heightened by increasing perceived severity of HPV and HPV-related diseases. It could advance benefits and cues to action of taking action and getting HPV vaccine. Perceived severity could diminish meaningfulness of perceived barriers for HPV immunization. Removal of perceived barriers could facilitate growth in meaningfulness of perceived benefits and cues to action for HPV vaccination. Also, increase in factual and evidence-based knowledge about HPV, HPV-related diseases, and HPV vaccination could facilitate reduction in meaningfulness of perceived barriers. Perceived

benefits of HPV immunization could be increased by strengthening cues to action in getting HPV vaccine.

Variance in Behavioral Intention Regarding the HPV Vaccination Accounted for by HBM Constructs and Knowledge

Seventy-five percent of the variance in behavioral intention getting HPV vaccination could be explained by perceived susceptibility, severity, barriers, benefits, self-efficacy, cues to action, and knowledge. These findings suggest that HBM proved to be effective model in exploring adaptation of new product (HPV vaccine) because constructs, modifying factors, and knowledge explained most of the behavioral intention. It could be inferred that HBM could serve as a useful and successful model for the development of HPV vaccination intervention programs.

Self-efficacy was the only HBM construct which statistically significantly predicted (r^2=.75; $p<.001$) behavioral intention to get HPV vaccination. These findings were somewhat different from Kahn's study (2008), which demonstrated that the following constructs of HBM independently contributed to the intention of participants to receive HPV vaccination: cues to actions, perceived severity, and perceived barriers. These findings suggest the need to explore other factors contributing to 24.8% of the variance in behavioral intention to get HPV vaccination, which still remained unknown. Furthermore, self-efficacy of Russian college students should be regarded as an ultimate factor for receiving HPV vaccination and should be boosted by intervention programs promoting HPV immunization.

Limitations of the Study

This research was limited by the self-report and data accuracy of participants in this study. The sensitive and personal nature of the survey items, which include items related to sexually transmitted infection and sexual behaviors, could have prevented participants from

answering survey questions honestly. There were no incentives for the respondents to complete the survey. Previous research (Dillman, 2000; Duffer et al., 1994) showed that offering incentives facilitated cooperation from sample subjects in data collection. This research was limited by the timeframe for survey distribution and data collection from December, 2011 through April, 2012. Results of this study could not be generalized to the college student population across Russia because the research was conducted at one public university located in the regional city of Northwestern part of Russia. Study results were influenced by the sensitivity of the instrument which meant the degree to which the instrument was able to identify true positive answers (in this study: knowledge, perceptions, and behaviors) correctly by discerning persons who are representatives of chosen responses (Howard, 2008). Even though oversampling was conducted and 270 participants responded to the survey that was larger than estimated sample size for this study. However, only 117 records were suitable for the data analysis due to the fact that 153 participants omitted to answer many items. This limitation suggests larger oversampling, prolonged timeframe of the study, and usage of incentives to elicit better response rate and survey completion rate.

Recommendations for Health Education Practice

In consideration of findings of this research, the following recommendations were made. This study holds wide implications for the health education practice and professional development because it was conducted through the theoretical framework of behavior change and barrier elimination, which are essential goals of health education. Study findings could allow for the development of health education intervention programs targeting areas of knowledge, perceptions and behaviors, particularly targeting self-efficacy as a moderating factor of HBM, and classical HBM perceptions: increasing perceived susceptibility and perceived benefits and

decreasing perceived barriers in Russian youth regarding HPV, HPV-attributable diseases, and HPV vaccine. .

Although sources of the information about HPV, HPV-attributed disease, and HPV vaccination were not explored in this study, health education might definitely facilitate conscious decision making for the HPV vaccination. The content of health education efforts should be prioritized by providing evidence-based information about myths and facts about HPV, HPV-attributed disease, and HPV vaccination, including HPV routs of transmission and HPV vaccine safety. To encourage college students to receive full benefits from the HPV vaccination, it is necessary to incorporate information about the HPV vaccination within curricula of health-related classes taken by students, especially for first and second year college students.

There is a need to promote youth immunization up-take within a framework of overall health and the affordability of the HPV vaccine. Thus, another recommendation is to provide information about immunization programs, including HPV vaccination, that are available on campus during new student orientations. It could be beneficial to create an immunization-counseling program through student health services to address individual concerns about the HPV vaccination. Education about HPV vaccination should be provided to students at high schools and their parents before students become sexually active and exposed to HPV. Consequently, they will be able to receive full benefit from HPV vaccination. Peers Reaching Out education programs could be effective in targeting the high-school and college levels. Since doctors are considered most respected recommenders regarding HPV immunization, health educators need to strengthen collaborative efforts with medical professionals.

Health educators could serve as a public health advocates changing health care insurance policies to include HPV immunization as a part of the regular childhood and adulthood

vaccination calendars with full health insurance coverage. College students would be more likely protected against carcinogenic and wart-causing types of HPV by establishing HPV immunization as a beneficial and required part of their health care.

Since there is no formal sex education in Russia, health educators, could serve as a sex education promoters and deliverers. It is scientifically proven that sex education provided before the initiation of sexual activities is ultimately effective in decreasing sexual activities, postponing sexual debuts, diminishing promiscuity, and boosting use of condoms and other contraceptive methods (Bankole, Ahmed, Neema, Ouedraogo, & Konyani, 2007; Howard & McCabe, 1990; Nobelius, et al., 2012)

Recommendations for Future Research

The findings of this study suggest that there is a need to collect data from a sample with more ethnic and religious diversity in other geographical parts of Russia. Future studies should sample similarly aged individuals who are not enrolled in college, adolescents, and older populations. There could be different findings concerning awareness, accessibility, and application of HPV vaccine obtained from more a diverse sample compared to Russian sample studied in this research. Also, there should be study of homosexual populations regarding HPV, HPV-related diseases, and HPV vaccine.

There is also need for further investigation of other barriers that could prevent college students from getting the HPV vaccinations, such as attitudes about preventive healthcare, concerns about side effects, and attitudes about mandatory vaccination programs. Also, taking into account findings of the present study, future research could explore why college students or even other relevant populations are embarrassed to ask their health care provider about HPV vaccination. Recognition of the need for protection against HPV infection and exploration of

family history and social network history regarding HPV-attributed cancers as a potential motivator or cue to action to receive HPV immunization are other recommendations for further research.

Also, there is a need to investigate parents of youth and health care providers (doctors and nurses, particularly pediatricians, gynecologists, venerologists, urologists, infectionists, and general practitioners) who serve HPV vaccination targeted population about their awareness, perceptions, and willingness to recommend HPV vaccination. There is a need to study the resources for obtaining information by youth about the HPV, HPV-related disease, and HPV vaccination.

HBM proved to be suitable for this study and future research could be done using HBM framework investigating acceptance/adoption of other medical products including other vaccines. Enhancing theory based research, knowledge, attitudes, and behaviors regarding HPV, HPV-related disease, and HPV vaccination need to be explored through other theoretical frameworks, such as Theory of Reasoned Action, Theory of Panned Behavior, Precaution – Adaptation Model, Value Expectancy Theory, Attribution Theory, Socio-cognitive Theory, and Diffusion of Innovation Theory, which could provide deep insights on variance in behavioral intention to receive HPV vaccination and on other contributing factors regarding this topic.

Sexual health behaviors among college youth could be explored in a greater depth. Taking into account routs of HPV transmission, it will be important to examining not only usage of condoms for vaginal, oral, and anal sex but, also, other barrier devices, such as dental dams. Also, multiple factors influencing condoms and dental dams use among college students should be investigated by future research, particularly, taking into consideration that, according to Turchik and Gidycz (2012), usually, males have a greater control over the condoms use and

females have a greater control of the other contraceptives use. Furthermore, Thomson, Stalker, and Toroitich-Ruto (2004) reported 50 reasons stated primarily by Kenyan males, in order to evade use of condoms; their findings could be a call for the future investigations of this important issue in other populations around the world including Russian males and females within Russian cultural context.

Also, historical longitudinal studies could provide better prospective, comparing samples who received HPV immunization as a child or young adult with those who did not receive it from the same population pool. Comparing experiences of HPV-positive samples with HPV-free samples regarding their knowledge, attitudes, and behaviors could provide in-depth understanding of HPV vaccine targeted populations.

The ultimate goal of disease prevention as well as promotion and preservation of the health and well-being of college students could be achieved by creating a positive perception of the vaccine as a safe and effective measure. This study investigated only one sample of college students at a Northwestern public university in Russia. HPV-attributed diseases, including cervical, penile, oral/throat, and anal cancers and their prevention, are worldwide problems. There is great potential for further investigation about the HPV vaccination acceptance in other countries, including developed and developing nations where the HPV vaccination has been approved for administration.

REFERENCES

Abramowitz, L., Benabderrahmane, D., Ravaud, P., Walker, F., Rioux, C., Jestin, C. … Duval, X. (2007). Anal squamous intraepithelial lesions and condyloma in HIV-infected heterosexual men, homosexual men and women: Prevalence and associated factors, *AIDS, 21,* 14-65.

Adams, S., Newacheck, P., Park, M., Brindis, C., & Irwin, C. (2007). Health insurance across vulnerable ages: Patterns and disparities from adolescence to the early 30s. *Pediatrics, 199,* 1033-1039.

Agosti, J. & Goldie, S. (2007). Introducing HPV vaccine in developing countries – key challenges and issues. *The New England Journal of Medicine, 356,* 1908-1910.

Alih, D. (2009). Fatherhood in Russia between 1970 and 2004: The male perspective of family and fertility behavior in a changing society. *Dissertation.* Rostock University, Rostock: Germany, 307.

Alreck, P. & Settle, R. (2004). *The Survey Research Handbook* (3rd ed.). New York, NY: McGraw-Hill/Irwin.

Allred, N., Shaw, K., Santibanez, T., Rickert, D., & Santoli, J. (2005). Parental vaccine safety concerns: Results from the National Immunization Survey, 2001-2002. *American Journal of Preventive Medicine, 28,* 221-224.

American Cancer Society. (2009). *Human papilloma virus (HPV), cancer, and HPV vaccines – Frequently asked questions.* Retrieved from http://www. cancer. org/docroot/CRI/ content/ CRI_2_6x_FAQ_ HPV_Vaccines.asp? sitearea=

American Cancer Society. (2010). *Human papilloma virus (HPV), cancer, and HPV vaccines—frequently asked questions: How much does the HPV vaccine cost? Is it*

covered by health insurance plans? Retrieved from http://www.cancer.org/Cancer/CancerCauses/OtherCarcinogens/InfectiousAgents/HPV/HumanPapillomaVirusandHPVVaccinesFAQ/hpv-faq-vaccine-cost

American Cancer Society. (2012). *Anal cancer: Causes, risk factors, and prevention topics.* Retrieved from http://www.cancer.org/Cancer/AnalCancer/DetailedGuide/anal-cancer-risk-factors

American College Health Association. (2006). American College Health Association National College Health Assessment (ACHA-NCHA) Spring 2005 reference group data report (abridged). *Journal of American College Health, 55* (1), 5-16.

American Social Health Association (ASHA). (2007). *Discover the vaccine used for females within the recommended age range.* Retrieved from http:// www. ashastd.org/pdfs/HPV_FAQ_032007.pdf

American Society of Colon and Rectal Surgeons. (2008). *Anal cancer*. Retrieved from http:// www.fascrs.org/patients/conditions/anal_cancer/

American Psychological Association (APA). (2012). Staying connected: A guide for parents on raising an adolescent daughter. *Brochure*, 1-37.

Andre, F., Booy, R. Bock, H., Clemens, J., Datta, S., John, T. … Schmitt, H. (2008). Vaccination greatly reduces disease, disability, death and inequity worldwide. *Bulletin of the World Health Organization, 86*(2), 81-160.

Anhang, R., Goodman A., & Goldie, S. (2004). HPV communication: Review of existing research and recommendations for patient education. *A Cancer Journal for Clinicians, 54,* 248-259.

Anhang, R., Wright, T., Smock, L, & Goldie, S. (2004). Women's desired information about human papillomavirus. *Cancer, 100,* 315-320.

Anticancer Society of Russia. (2010). *Cervical cancer.* Retrieved from http://www. pror.ru/ forms_big_cervix.shtml

Armstrong, C. (2007). ACIP releases recommendations on quadrivalent human papillomavirus vaccine. *American Family Physician, 75,* 1391-1394.

Aylamazyan, E., Rogovskaya, S., Bosch, X., Tarasova, M., Ashrafyan, L., Urmancheva, A. … Bahridze, E. (2008). *Gardasil – vaccine against human papilloma virus.* Retrieved from http://med122.com/about/structure/detail/295/page/1690/

Bankole, A., Ahmed, F., Neema, S., Ouedraogo, C. & Konyani, S. (2007). Knowledge of correct condom-use and consistency of use among adolescents in four countries in Sub-Saharan Africa, *African Journal of Reproductive Health, 11,* 197-220.

Baker, J. & Katz, S. (2004). Childhood vaccine development: An overview. *Pediatric Research, 55,* 347-356.

Barlett, D., Williams, L., & Curtis, R. (2008). Uptake of HPV vaccine: Immunization information systems sentinel sites. *National STD Prevention Conference.* Chicago, IL.

Basu, S., Chapman, G., & Galvani, A. (2008). Integrating epidemiology, psychology, and economics to achieve HPV vaccination targets. *Proceedings of National Academy of Science, 105*(48), 19018-19023.

Batkaev, E., Ryumin, D., Drozdova, I., & Kucherov. V. (2010). Differential approach to complex treatment of genital papilloma virus infection. *Herald of Postgraduate Medical Education, 1,* 77-79.

Bayas, J., Costas, L., & Munoz, A. (2008). Cervical cancer vaccination indications, efficacy, and side effects. *Gynecologic Oncology, 110*(3), S11-14.

Becker, M., Drachman, R., & Krischt, J. (1974). A new approach to explaining sick-role behavior in low-income populations. *American Journal of Public Health, 64,* 205-216.

Bergeron, C., Largeron, N., McAllister, R., Mathevet, P., & Remy, V. (2008). Cost-effectiveness analysis of the introduction of a quadrivalent human papilloma vaccine in France. *International Journal of Technology Assessment in Health Care*, *24*(1), 10-19.

Binham, A., Drake, J., & LaMontagne, S. (2009). Sociocultural issues in the introduction of human papillomavirus vaccine in low-resource settings. *Archives of Pediatrics and Adolescent Medicine, 163*(5), 455-461.

Biology-Online. (2005). *Vaccine.* Retrieved from http://www.biology-online.org/dictionary/vaccine

Black, L., Zimet, G., Short, M., Sturm, L., & Rosenthal, S. (2009). Literature review of human papilloma virus vaccine acceptability among women over 26 years. *Vaccine,27,* 1668-1673.

Blue, C. & Valley, J. (2002). Predictors of influenza vaccine. Acceptance among healthy adult workers. *American Association of Occupational Health Nurses Journal, 50*(5), 227–233.

Boehner, C., Howe, S., Bernstein, D., & Rosenthal, S. (2003). Viral sexually transmitted disease vaccine acceptability among college students. *Sexually Transmitted Diseases*, *30,* 774–778.

Bond, S. (2009). Preventing cervical cancer: Challenges to implementing HPV vaccine strategies among medically underserved populations. *Dissertation.* Medical University of South Carolina, South Carolina, 131.

Bosch, F. & de Sanjose S. (2003). Chapter 1: Human papillomavirus and cervical cancer-burden and assessment of causality. *Journal of the National Cancer Institute Monographs, 31,* 3-13.

Bosch, F., Lorincz A., Munoz N., Meijer L., & Shah K. (2002). The causal relationship between papillomavirus and cervical cancer. *Journal of Clinical Pathology, 55,* 244-265.

Bosch, F., Manos, M., Munoz N., Sherman, M., Jansen, A, Petro, A. … Shah, K. (1995). Prevalence of human papillomavirus in cervical cancer: A worldwide perspective. *Journal of National Cancer Institute, 87,* 796-802.

Bosch, F., Stanley, M., Write, T., Franco E., Herrero, R., Munoz, N. … Garland, S. (2008). A scientific response to prevent cervical cancer in the world. *Vaccine, 26*(10), v-vi.

Brabin, L., Roberts, S., Farzaneh, F., & Kitchener, H. (2006). Future acceptance of adolescents' human papillomavirus vaccination: A survey of parental attitudes. *Vaccine, 24,* 3087-3094.

Brabin, L., Roberts, S., & Kitchener, H. (2007). A semi-qualitative study of attitudes to vaccinating adolescents against human papillomavirus without parental consent. *Public Health, 7*(20), 1-7.

Brabin, L., Roberts, S., Stretch, R., Baxter, D., Chambers, G., Kitchener, H., & McCann, R. (2008). Uptake of first two doses of human papillomavirus vaccine by adolescent schoolgirls in Manchester: Perspective cohort study. *British Medical Journal, 336,* 1136.

Bray F., Pisani, P., & Parkin, D. (2004). Globocan 2002: Cancer incidence, mortality and prevalence worldwide. *International Agency for Research on Cancer (IARC cancer database, 5*(2), IARC Press, Lyon.

Brewer, N., Chapman, G., Gibbons, F., Gerrard, M., McCaul, K., & Weinstein, N. (2007). Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination. *Health Psychology, 26*(2), 136–145.

Brewer, N. & Fazekas, K. (2007). Predictors of HPV vaccine acceptability: A theory-informed systematic review. *Preventive Medicine, 45,* 107-114.

Brewer, N., Ng, T., McRee, A., & Reiter, P. (2010). Men's beliefs about HPV-related disease. *Journal of Behavioral Medicine, 33,* 274-281.

Brisson, M., Van de Velde, N., De Wals, P., & Boily, M. (2007). The potential cost-effectiveness of prophylactic human papillomavirus vaccines in Canada. *Vaccine, 25,* 5399-5408.

Brusina, E., Magarill, A., & Kutihin, A. (2011). *Epidemiology of cancer.* KemGMA: Kemerovo, Russia.

Calandrillo, S. (2004).Vanishing vaccination: Why are so many Americans opting out of vaccinating their children. *University of Michigan Journal of Law Reform, 37,* 1-82.

Campos-Outcalt, D. (2009). The case for HPV immunization. *The Journal of Family Practice, 58*(12), 660-664.

Castilaw, D. & Wittet, S. (2007). Preventing cervical cancer: Unprecedented opportunities for improving women's health. *Outlook, 23*(1), 1-12.

Centers for Disease Control and Prevention (CDC). (1999). Achievements in public health, 1900-1999: Impact of vaccines universally recommended for children—United States, 1990-1998. *Morbidity and Mortality Weekly Report, 48*, 243-48.

Centers for Disease Control and Prevention (CDC). (2003). *Youth online comprehensive results. Youth Behavior Surveillance System.* Retrieved from http://apps.nccd.cdc.gov/yrbss/QuestYearTable.asp?ByVar=CI&cat=4&quest=Q60&loc=XX&year=2003

Centers for Disease Control and Prevention (CDC). (2004). *General HPV infection — CDC fact sheet.* Retrieved from http://www.cdc. gov/std/HPV/STDFact-HPV.htm

Centers for Disease Control and Prevention (CDC). (2006a). *CDC's advisory committee recommends human papillomavirus vaccination [press release]*. Retrieved from http.//www.cdc.gov/od/oc/media/ pressrel/r060629.htm

Centers for Disease Control and Prevention (CDC). (2006b). HPV (Human Papilloma Virus) Vaccine: What you need to know [vaccine information statement], 1-2.

Centers for Disease Control and Prevention (CDC). (2007). *Quadrivalent human papilloma virus vaccine. Recommendations for the Advisory Committee on Immunization Practices.* Retrieved from http://www.cdc.gov/mmwr/pdf/rr/rr5602.pdf

Centers for Disease Control and Prevention (CDC). (2008). Vaccination coverage among adolescents aged 13-17 years – United States, 2007. *Morbidity and Mortality Weekly Report, 57,* 1103-1110.

Centers for Disease Control and Prevention (CDC). (2009). Genital HPV infection – CDC fact sheet. Retrieved from http://www.cdc.gov/STD/HPV/STDFact-HPV.htm

Centers for Disease Control and Prevention (CDC). (2010). *Vaginal and vulvar cancers.* Retrieved from http://www.cdc.gov/cancer/vagvulv/

Centers for Disease Control and Prevention (CDC). (2011a). *Human papilloma virus: What is HPV?* Retrieved from http://www.cdc.gov/hpv/W hatIsHPV.html

Centers for Disease Control and Prevention (CDC). (2011b). *Sexually transmitted diseases (STDs): HPV and men – fact sheet.* Retrieved from http://www.cdc.gov/ vaccines/vpd-vac/hpv/vac-faqs.htm

Centers for Disease Control and Prevention (CDC). (2011c). Sexual identity, sex of sexual contacts, and health-risk behaviors among students in grades 9–12 — Youth Risk Behavior Surveillance, selected sites, united States, 2001–2009. *Morbidity and Mortality Weekly Report, 60,* 1-135.

Centers for Disease Control and Prevention (CDC). (2012a). *Vaccines and preventable diseases: HPV vaccine - questions & answers.* Retrieved from http://www.cdc.gov/vaccines/vpd-vac/hpv/vac-faqs.htm

Centers for Disease Control and Prevention (CDC). (2012b). *Trends in the prevalence of sexual behaviors and HIV testing National YRBS: 1991–2011* Retrieved from http://www.cdc.gov/healthyyouth/yrbs/pdf/us_sexual_trend_yrbs.pdf

Chandra, A., Martinez, G., Mosher, W., Abma, J., & Jones J. (2005). Fertility, family planning, and reproductive health of U.S. women: Data from the 2002 National Survey of Family Growth. *National Center for Health Statistics. Vital and Health Statistics 23(25)*, 1-156.

Chapman, G. & Coups, E. (1999). Predictors of influenza vaccine acceptance among healthy adults. *Preventive Medicine, 29*(4), 249–262.

Charo, R. (2007). Politics, parents, and prophylaxis – mandating HPV vaccination in the United States. *The New England Journal of Medicine, 356,* 1905-1908.

Chong, E., Hallman, K., & Brady, M. (2006). Investing when it counts: Generating the evidence base for policies and programmes for very young adolescents: Guide and tool kit. *United Nations Population Fund, Populations Council.* New York, NY: United Nations Population Fund, Population Council.

Colgrove, J. (2006). The ethics and politics of compulsory HPV vaccination. *New England Journal of Medicine, 355,* 2389-2391.

Conroy, K., Rosenthal, S., Zimet, G., Jin, Y., Bernstein, D., Glynn, S., & Kahn, J. (2009). Human papillomavirus vaccine uptake, predictors of vaccination, and self-reported barriers to vaccination. *Journal of Women's Health, 18*(10), 1679-1686.

Constantine, N. & Jerman, P. (2007). Acceptance of human papillomavirus vaccination among Californian parents of daughters: A representative statewide analysis. *Journal of Adolescents Health, 40,* 108-115.

Cook, C., Heath, F., & Thompson, R. (2000). A meta-analysis of response rates in web- and internet-based surveys. *Educational and Psychological Measurement, 60,* 821-836.

Creswell, J. (1994). *Research Design: Qualitative and Quantitative.* Thousand Oaks, CA: SAGE.

Cuardo, M., Edwards, C., Shin, H, Storm, H., Ferlay, J., Heanue, M., & Boyle, P. (2007). Cancer incidence in five continents. *IARC Scientific Publication, IX*(160), 1-897.

Cupp, M., Malek, R., Goellner, J., Smith, T., & Espy, M. (1995). The detection of human papillomavirus deoxyribonucleic acid in intraepithelial, in situ, verrucousus and invasive carcinoma of the penis. *Journal of Urology, 154,* 1024-1029.

Daley, E. (1998). Clinical update on the role of HPV and cervical cancer. *Cancer Nursing, 21,* 31-35.

Daley, E., Buhni, E., Vamos, C., Kolar, S., Hernandez, N., Marhefka, S., … Giuliano, A. (2012). Deconstructing the feminization of HPV: Why HPV should matter to men. *Prevention and Wellness Across the Lifespan: APHA 140th Annual Meeting and Expo,* San-Francisco, CA. Retrieved from https://apha.confex.com/apha/140am/webprogram/Paper264101.html

Danish Centre for Health Technology Assessment. (2007). Reduction in the risk of cervical cancer by vaccination against human papillomavirus (HPV). *A Health Technology Assessment Copenhagen, National Board of Health.*

Dasbach, E., Elbasha, E., & Insigna, R. (2006). Mathematical models for predicting the epidemiologic and economic impact of vaccination against human papilloma virus infection and disease. *Epidemiologic Reviews, 28,* 88-100.

Davies, P. (2009). HPV vaccination across Europe. *European Cervical Cancer Association (ECCA),* 1-13.

Davis, K., Dickman, E., Ferris, D., & Dias, J. (2004). Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents. *Journal of Lower Genital Tract Disease*, 8, 188–194.

Dell, D., Chen, H., Ahmad, F., & Stewart, E. (2000). Knowledge about human papillomavirus among adolescents. *Obstetrics and Gynecology, 96,* 653–656.

Dempsey (2006). Overcoming barriers of adherence to HPV vaccination recommendations. *The American Journal of Managed Care, 12,* 484-491.

Dempsey, A., Zimet, G., Davis, R., & Koutsky, L. (2006). Factors that are associated with parental acceptance of human papillomavirus vaccines: A randomized intervention study of written information about HPV, *Pediatrics, 117,* 1486-1493.

Dennehy, P. (2001). Active immunization in the United States: Developments over the past decade. *Clinical Microbiology Reviews, 14,* 872-908.

Descamps, D., Hardt, K., Spiessens, B., Izurieta, P., Verstraeten, T., Breuer, T., & Dubin, G. (2009). Safety of human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine for

cervical cancer prevention: a pooled analysis of 11 clinical trials. *Human Vaccines, 5*(5), 332-40.

Dessy, F., Giannini, S., Bougelet, C., Kemp, T., David, M., Poncelet, S. … Wettendorff, M. (2008). Correlation between direct ELISA, single epitope-based inhibition ELISA and pseudovirion-based neutralization assay for measuring anti-HPV-16 and anti-HPV-18 antibody response after vaccination with the AS04-adjuvanted HPV-16/18 cervical cancer vaccine. *Human Vaccines, 4*(6), 425-434.

De Visser, R. (2007). Why do heterosexual young adults who use reliable contraception also use condoms? Results from a diary-based prospective longitudinal study. *British Journal of Health Psychology, 12,* 305-313.

Diekema, D. (2005). Responding to parental refusals of immunization of children. *Pediatrics*, *115,* 1428–1431.

Dignan, M. (1995). *Measurement and Evaluation of Health Education* (3ed.) Springfield, IL: Charles C. Thomas Publisher.

Dillman, D. (2000). *Mail and Internet Surveys.* New York, NY: John Wiley & Sons, Inc.

Dillman, D., Smyth, J., & Christian, L. (2009). *Internet, Mail, and Mixed-mode Surveys': The Tailored Design Method* (3rd ed.). Hoboken, NJ: John Wiley & Sons.

Douglas, J. (2008). Papillomavirus. In L. Goldman & D. Ausiello (Eds.), *Cecil's Medicine*, (23rd ed.). Philadelphia, PA: Saunders Elsevier.

Duffer, A., Lessler, J., Weeks, M., & Mosher, M. (1994). Effects of incentive payments on response rates and field costs in a pretest of a national CAPI Survey. *The Annual Meeting of the American Statistical Association,* Toronto, Canada.

Dunne, E. & Markowitz, L. (2006). Genital human papilloma virus infection. *Emerging Infections, 43,* 624-629.

Dunne, E., Unger, E., Sternberg, M., McQuillan, G., Swan, D., Patel, S., & Markowitz, L. (2007). Prevalence of HPV infection among females in the United States. *Journal of the American Medical Association*, *297*(8), 813-819.

Dursun, P., Altuntas, B., Kuscu, E., & Ayhan, A. (2009). Women's knowledge about human papillomavirus and their acceptance of HPV vaccine. *Australian and New Zealand Journal of Obstetrics and Gynecology, 49,* 202-206.

Eckert, L. & Lentz, G. (2007). Infections of the lower genital tract: vulva, vagina, cervix, toxic shock syndrome, HIV infections. In V. Katz, G. Lentz, R. Lobo, & D. Gershenson, (Eds.). *Comprehensive Gynecology* (5th ed.). Philadelphia, PA: Mosby.

Educational Student Department. (2012). Data on full-time enrolled students. *Personal Communication.* Yaroslav-the-Wise Novgorod State University (NOVSU).

Einstein, M., Baron, M., Levin, M., Chatterjee, A., Edwards, R., Zepp, F. … Dubin, G. (2009).Comparison of the immunogenicity and safety of Cervarix() and Gardasil((R)) human papillomavirus (HPV) cervical cancer vaccines in healthy women aged 18-45 years. *Human Vaccines, 5*(10), 705-19.

Esiashvili, N., Landry, J., & Matthews, R. (2006).Carcinoma of the anus: Strategies in management. *Armenia Medical Network.* Retrieved from http://www.health.am/cr/carcinoma-of-the-anus-management/

Fazekas, K., Brewer, N., & Smith, J. (2008). HPV vaccine acceptability in a rural southern area. *Journal of Women's Health, 17*(4), 539-548.

Federal Food and Drug Administration (FDA). (2009a). *Gardasil. Approval Letter.* Retrieved from http://www.fda.gov/BiologicsBloodVaccines/ ApprovedProducts/USM094042

Federal Food and Drug Administration (FDA). (2009b). *FDA approves new indication for Gardasil to prevent genital warts in men and boys. FDA news release.* Retrieved from http://www.fda.gov/NewsEvents/Newsroom/Press Announcements/ucm187003.htm

Ferlay, J., Bray, F., Pisani, P, & Parkin, D. (2004). GLOBACON 2002: Cancer incidence, mortality, and prevalence worldwide. *IARC Cancer Base, 5*(2). Lyon: IARCPress.

Fernandez, M., McCurdy, S., Arvey, S., Tyson, S., Morales-Campos, D., Flores, B. … Sanderson, M. (2009). HPV knowledge, attitudes, and cultural beliefs among Hispanic men and women living on the Texas-Mexico Border. *Ethnicity and Health, 14*(6)*,* 607-624.

Ferris, D., Waller, J., Miller, J., Patel, P., Jackson, L., Price, G., & Wilson, C. (2008). Men's attitudes toward receiving the human papillomavirus vaccine. *Journal of Low Genital Tract Disease, 12,* 276-281.

Ferris, D., Waller, J., Miller, J., Patel, P., Jackson, L., Price, G., & Wilson, C. (2009). Variables associated with human papillomavirus (HPV) vaccine acceptance by men. *Journal of the American Board of Family Medicine, 22,* 34-42.

Fife, K. Wheeler, C., Koutsky, L., Barr, E., Brown, D., Schiff, M. … Johnson, D. (2004). Dose-ranging studies of the safety and immunogenicity of human papillomavirus type 11 and type 16 virus-like particle candidate vaccines in young healthy women. *Vaccine, 22,* 2943-2952.

Flannery, D., Ellingson, L. Votaw, K., & Schaefer, E. (2003). Anal intercourse and sexual risk factors among college women 1993-2000. *American Journal of Health Behavior, 27,* 228-234.

Frazer I. (2006). HPV vaccines. *International Journal of Gynecology & Obstetrics*, 94, 81–88.

Fred Hutchinson Cancer Research Center. (2004). *News releases: Changing trends in sexual behavior may explain rising incidence of anal cancer among American men and women.* Retrieved from http://www.fhcrc.org/en/news/releases/2004/07/analcancer.html

Friedman, A. & Shepeard, H. (2006). Exploring the knowledge, attitudes, beliefs, and communication preferences of the general public regarding HPV: Findings from CDC focus group research and implications for practice. *Health Education and Behavior, 22,* 1-15.

Frisch, M. & Johansen, C. (2000). Anal carcinoma in inflammatory bowel disease. *British Journal of Cancer, 83*(1), 89–90.

Gay, L. & Airasian, P. (2003). *Educational Research. Competencies for Analysis and Applications* (7th ed.). Pearson Education, Inc., Upper Saddle River, NJ.

Garland, S., Hernandez-Avila, M., Wheeler, C., Perez, G., Harper, D., Leodolter, S. … Koutsky, L. (2007). Quadrivalent vaccine against human papillomavirus to prevent anogenital diseases. *New England Journal of Medicine, 356,* 1928-1943.

Garnett, G., Kim, J., French, K., & Goldie, S. (2006). Chapter 21: Modeling the impact of HPV vaccines on cervical cancer and screening programmes. *Vaccine, 24*(3), S178-S186.

Garcia, F. & Saslow, D. (2007). Prophylactic human papillomavirus vaccination: A breakthrough in primary cervical cancer prevention. *Obstetrics and Gynecology Clinics of North America, 34,* 761-781.

Gerend, M. & Barley, J. (2009). Human papilloma vaccine acceptability among young adult men. *Sexually Transmitted Diseases, 36,* 58-62.

Gerend, M., Lee, S., & Shepherd, J. (2006). Predictors of human papillomavirus vaccination acceptability among underserved women. *Sexually Transmitted Diseases, 33,* 1-4.

Gibbs, N. (2006). Defusing the war over the "promiscuity" vaccine. *Time.* Retrieved from http://www.time.com/time/nation/article/0,8599,1206813,00.html

Gilbert, P., Brewer, N., Reiter, P., Ng, T., & Smith, J. (2010). HPV vaccine acceptability in heterosexual, gay, and bisexual men. *American Journal of Men's Health, 20*(10), 1-9.

Gillison, M., Chaturvedi, A., & Lowy, D. (2008). HPV prophylactic vaccines and the potential prevention of noncervical cancers in both men and women. *Cancer*, *113*(10)*,* S3036-S3046.

Giuliano A. & Palefsky, J. (2009). Quadrivalent HPV vaccine efficacy against male genital disease and infection. *International Papilloma Virus Conference 2009,* Malmo, Sweden.

Giuseppe, G., Abbate, R., Liguori, G., Albano, L., & Angelillo, I. (2008). Human papillomavirus and vaccination: Knowledge, attitudes, and behavioral intention in adolescents and young women in Italy. *British Journal of Cancer, 99,* 225-229.

GlaxoSmithKline UK. (2009). Cervarix. *Datapharm Communications Ltd.* Retrieved from http://emc.medicines.org.uk/medicine/20204/SPC/Cervarix/

GlaxoSmithKline UK. (2011). *Highlights of prescribing information: Cervarix.* [Brochure].

Goldhaber-Fiebert, J., Stout, N., Ortendahl, J., Kuntz, K., Goldie, S., & Salomon, J. (2007). Modeling human papillomavirus and cervical cancer in the United States for analysis of screening and vaccination. *Population Health Metrics, 5*(11), 1-19.

Goldie, S., Kohli, M., Grima, D., Weinstein, M., Wright, T., Bosch, F., & Fanco, E. (2004). Projected clinical benefits and cost-effectiveness of a human papillomavirus 16/18 vaccine. *Journal of the National Cancer Institute, 96,* 604-615.

Gonik, B. (2006). Strategies for fostering HPV vaccine acceptance. Clinical study. *Infectious Diseases in Obstetrics and Gynecology,* 1-4.

Grace, J. (2006). Adolescent immunization: Challenges and opportunities. *The Journal of School Nursing, 22,* 87–93.

Grello, C., Welsh, D., & Harper, M. (2006). No string attached: The nature of casual sex in college students. *Journal of Sex Research, 43,* 255-267.

Greer, C., Wheeler, C., Landner, M., Beutner, K., Coyne, M., Liang, H. … Ralston, R. (1995). Human papillomavirus (HPV) type distribution and serological response to HPV type 6 virus-like particles in patients with genital warts. *Journal of Clinical Microbiology, 33*(8), 2058-2063.

Gullette, D. & Lyons, A. (2006). Sensation seeking, self-esteem, and unprotected sex in college students. *Journal of the Association of Nurses in AIDS Care, 17*(5), 23-31.

Hanson, C. (2010). Review of relevance and impact of immunization strategies on maternal and women's health. *GAVI Alliance.* Retrieved from http:// fr.gavialliance.org/resources/ review_of_ immunisation_strategies_on_women _s_health.pdf

Harper, D. (2008). Impact of vaccination with Cervarix (trade mark) on subsequent HPV-16/18 infection and cervical disease in women 15-25 years of age. *Gynecologic Oncology, 110*(3), S11-S7.

Harper, D, Franco, E., Wheeler, C., Ferris, D., Jenkins, D., Schuind, A. … Dubin, G. (2004). GlaxoSmithKline HPV vaccine study group. Efficacy of a bivalent L1 virus-like particle

vaccine in prevention of infection with human papillomavirus types 16 and 18 in young women: A randomized control trial. *Lancet, 364* (9447), 1756-1765.

Harper, D, Franco, E., Wheeler, C., Moscicki, A., Romanowski, B., Roteli-Martins, C. … Dubin, G. (2006). Sustained efficacy up to 4.5 years of a bivalent L1 virus-like particle vaccine against human papillomavirus types 16 and 18: Follow-up from a randomized control trial. *Lancet, 367,* 1247-1255.

Harris, G. (2006). Panel unanimously recommends cervical cancer vaccine for girls 11 and up. *The New York Times.*

Harrison, J., Mullen, P., & Green, L. (1992). A meta-analysis of studies of the Health Belief Model. *Health Education Research, 7,* 107–116.

Health Protection Agency (2005). *Diagnosis and rates of selected STIs seen at GUM clinics, United Kingdom: 2000-2004. National, regional, and strategic authority summary tables.* Retrieved from www.hpa.org.uk

Herzog, T., Huh, W., Downs, L., Smith, J., & Monk, B. (2008). Initial lessons learned in HPV vaccination. *Gynecologic Oncology, 109*(2), S4-S11.

Hildesheim, A., Herrero, R., Wacholder, S., Rodriguez, A., Solomon, D., Bratti, M. … Lowy, D. (2007). Effect of human papillomavirus 16/18 L1 virus like particle vaccine among young women with preexisting infection: A randomized trial. *Journal of the American Medical Association*, *298*(7), 743–753.

Hochbaum, G. (1959). *Public Participation in Medical Screening Programs: A Socio-psychological Study.* PHS publication no. 572. Washington, D.C.: Government Printing Office.

Holcomb, B., Bailey, M., Crawford, K., & Ruffin, M. (2004). Adults' knowledge and behaviors related to human papillomavirus infection. *The Journal of the American Board of Family Practice, 17,* 26–31.

Honey, K. (2006). HPV vaccine gets a shot in the arm. *The Journal of Clinical Investigation, 116,* 3087.

Hoover, D., Carfioli, B., & Moench, E. (2000). Attitudes of adolescent/young adult women toward human papillomavirus vaccination and clinical trials. *Health Care for Women International, 21,* 375–391.

Howard, K. (2008). *Validating Questionnaires.* Kestrel Consultants, Inc. Retrieved from http://kestrelconsultants.com/reference_files/Validating_Questionnaires.pdf

Howard, M. & McCabe, J. (1990). Helping teenagers postpone sexual involvement. *Family Planning Perspectives, 22,* 21-26.

Howlader, N., Noone, A., Krapcho, M., Neyman, N., Aminou, R. … Edwards, B. (eds). (2011). *SEER Cancer Statistics Review, 1975-2008*, National Cancer Institute. Bethesda, MD. Retrieved from http://seer.cancer.gov/statfacts/html/anus.html

Immunization Action Coalition. (2009). *Vaccine information for public and health professionals: HPV vaccine.* Retrieved from http://www.vaccineinformation.gov/HPV/qandavax.asp

Insinga, R., Glass, B., & Rush B. (2004). The health care costs of cervical human papillomavirus-related disease. *American Journal of Obstetrics and Gynecology, 191,* 114-120.

Irwin, K. (2008). HPV vaccine introduction throughout the world: Lessons learned. *UICC World Cancer Congress.* Geneva, Switzerland.

Issac, S. & Michael, W. (1995). *Handbook in Research and Evaluation.* San Diego, CA: EdITS

Jain, N., Euler, G., Shefer, A., Lu, P., Yankey, D, & Markowitz, L. (2009). Human papillomavirus (HPV) awareness and vaccination initiation among women in the United States, National Immunization Survey-Adult 2007. *Preventive Medicine, 48,* 426-431.

Janz, N., Champion, V., & Skinner, V. (2002).The Health Belief Model. In Glanz, K., Rimer, B., & Lewis, F. (Eds.), *Health Behavior and Health Education: Theory, Research and Practice* (3rd ed.). San Francisco, CA: Joosey-Bass.

Jones, M., & Cook, R. (2008). Intent to receive an HPV vaccine among university men and women and implications for vaccine administration. *Journal of American College Health, 57*(1), 23-32.

Joura, E., Leodolter, S., Hernandez-Avila, M., Wheeler, C., Perez, G., Koutsky, L. … Paavonen, J. (2007) Efficacy of a prophylactic quadrivalent human papillomavirus (types 6, 11, 16, and 18) L1 virus-like particle vaccine against high-grade vulval and vaginal lesions: a combined analysis of three randomized clinical trials. *Lancet, 369,* 1693-1702.

Kahn, J., Rosenthal S., Hamann, T. & Bernstein, I. (2003). Attitudes about human papillomavirus vaccine in young women. *International Journal of STD & AIDS, 14,* 300–306.

Kahn, J., Rosenthal, S., Jin, Y., Huang, B., Namakydoust, A., & Zimet, G. (2008) Rates of human papillomavirus vaccination, attitudes about vaccination, and human papillomavirus prevalence in young women. *Obstetrics and Gynecology, 111*(5), 1003-1010.

Kahn, J., Rosenthal S., Tissot, A., Bernstein, D., Wetzler, C., & Zimmet, G. (2007). Factors influencing pediatricians' intentions to recommend human papillomavirus vaccines. *Ambulatory Pediatrics, 7,* 367-373.

Kahn, J., Slap, G., Bernstein, D., Kollar, L., Tissot, A., Hillard, P., & Rosenthal. S. (2005). Psychological, behavioral, and interpersonal impact of human papillomavirus and Pap test results. *Journal of Women's Health, 14*(7)*,* 650-659.

Kantor, A. (2007). New immunization project adolescents. *America's Health Insurance Plans.* Retrieved from http://www.ahip.org/content/default.aspx?bc=31|130|136|21734|21736

Keam, S. & Harper, D. (2008). Human papillomavirus types 16 and 18 vaccine (recombinant, AS04 adjuvanted, adsorbed) [Cervarix]. *Drugs, 68*(3), 359-72.

Kim, J., Andres-Beck, B., & Goldie, S. (2007). The value of including boys in an HPV vaccination programme: a cost-effectiveness analysis in a low-resource setting. *British Journal of Cancer, 97,* 1322-1328.

Kim, J., Kuntz, K., Stout, N., Mahmud, S., Villa, L., Franco, E., & Goldie, S. (2007). Multiparameter calibration of a natural history model of cervical cancer. *American Journal of Epidemiology, 166,* 137-150.

Kimmel, S. (2006). Practical implementation of HPV vaccines in clinical practice. *Journal of Family Practice, 55,* 18-22.

Kjaer, S., Tran, T., Sparen, P., Tryggvadottir, L., Munk, C., Dasbach, E. … Nygard, M. (2007). The burden of genital warts: A study of nearly 70,000 women from the general female population in the 4 Nordic countries. *Journal of Infectious Diseases, 196*(10), 1447-1454.

Kohli, M., Ferko, N., Martin, A., Franco, E., Jenkins, D. … Drummond, M. (2007). Estimating the long-term impact of a prophylactic human papillomavirus 16/18 vaccine on the burden of cervical cancer in the UK. *British Journal of Cancer, 96*(1), 143-150.

Korfage, I., Essink-Bot, M., Daamen, R., Mols, F., & Van Ballegooijen, M. (2008). Women show mixed intentions regarding the uptake of HPV vaccinations in pre-adolescents: A questionnaire study. *European Journal of Cancer, 44,* 1186-1192.

Kostyuk, I. (2003). *Cancer of anal canal. Colorectal cancer.* Retrieved from http://www.lood.ru / digestive-diseases/anus-cancer.html

Koutsky, L. (1997). Epidemiology of genital human papillomavirus infection. *American Journal of Medicine, 102*(5A), 3-8.

Koutsky, L., Ault, K., Wheeler, C., Brown, D., Barr, E., Alvarez, F. … Jensen, K. (2002). A controlled trial of a human papillomavirus type 16 vaccine. *New England Journal of Medicine, 347*(21), 1645–1651.

Koutsky, L. & Harper, D. (2006). Chapter 13: Current findings from prophylactic HPV vaccine trials. *Vaccine, 24*(3), S114-S121.

Krasnopolsky, V., Zarochentseva, N., Serova, O., Bulychyova, E., & Belaya, Y. (2010). Vaccine prevention of human papillomavirus-induced cancer diseases in the Moscow Region. *Russian Herald of Obstetrician -Gynecologist, 1,* 71-75.

Kuder, G. & Richardson, M. (1937). The theory of the estimation of test reliability. *Psychometrika, 2*, 151-60.

Kulasingam, S., Benard, S., Barnabas, R., Largeron, N., & Myers, E. (2008). Adding a quadrivalent human papillomavirus vaccine to the UK cervical cancer screening programme: A cost-effectiveness analysis. *Cost Effectiveness and Resource Allocation,* 6(4)*,* 1-11.

Kulasingam, S., Connelly, L., Conway, E., Hocking, J., Myers, E. … Wain G (2007). A cost-effectiveness analysis of adding a human papillomavirus vaccine the Australian National Cervical Cancer Screening Program. *Sexual Health, 4,* 165-175.

Kulasingam, S. & Myers, E. (2003). Potential health and economic impact of adding human papillomavirus vaccine to screening programs. *Journal of the American Medical Association, 290,* 781-789.

Kutusheva, G. (2010). Problems of the HPV infection in children and adolescents. *Report.* III Regional Scientific and Practical Conference "Vorontsov's readings". Saint Petersburg.

Lacey, C., Lowndes, C., & Shah, K. (2006). Chapter 4: Burden and management of non-cancerous HPV-related conditions: HPV-6/11 disease. *Vaccine, 24*(3), 35-41.

Lambert, E. (2001). College students' knowledge of human papillomavirus and effectiveness of a brief educational intervention. *The Journal of the American Board of Family Practice, 14,* 178–183.

Larson, A. (2011). The knowledge, attitudes, and behaviors of gay, lesbian, bisexual, and transgender university of South Florida (USF) students concerning Human Papillomavirus (HPV) and the HPV vaccine. *Thesis.* University of South Florida, Tampa, 55.

Laska, M., Pasch, K., Lust, K., Story, M., & Ehlinger, E. (2009). Latent class analysis of lifestyle characteristics and health risk behaviors among college youth. *Prevention Science, 10,* 376-386.

Leader, A., Weiner, J., Kelly, B., Hornik, R., & Cappella, J. (2009). Effects of information framing on human papillomavirus vaccination. *Journal of Women's Health, 18*(2), 225-233.

Le Tallec, D., Doucet, D., Elouahabi, A., Harvengt, P., Deschuyteneer, M., & Deschamps, M. (2009). Cervarix, the GSK HPV-16/HPV-18 AS04-adjuvanted cervical cancer vaccine, demonstrates stability upon long-term storage and under simulated cold chain break conditions. *Human Vaccines, 5*(7), 467-74.

Liddon, N., Hood, J., Wynn, B., & Markowitz, L. (2010). Acceptability of Human Papilloma vaccine for males: A review of literature. *Journal of Adolescent Health, 46,* 113-123.

Lin, A., Gridley, G., & Tucker, M. (1995). Benign anal lesions and anal cancer. *New England Journal of Medicine, 332*(3), 190–191.

Lunau, K. (2009). Should boys get the HPV shot? *Maclean's*, *122(43),* 46.

Madrid-Marina, V., Torres-Poveda, K., Lopez-Toledo, G., & Garcia-Carranca, A. (2009). Advantages and disadvantages of current prophylactic vaccines against HPV. *Archives of Medical Research, 40*(6), 471-477.

Maggon, K. (2011). Cervarix (Glaxo Smith Kline) vaccine for cervical cancer. *Guild (KPG)*, *63*, Knol Publishing. Retrieved from http://knol.google.com/k/krishan-maggon/cervarix-glaxo-smith-kline-vaccine-for/3fy5eowy8su q3/88.

Maloney, E., Unger, E., Tucker, R., Swan, D., Karem, K., Wendell, T., & Reeves, W. (2006). Longitudinal measures of human papillomavirus 6 and 11 viral loads and antibody response in children with recurrent respiratory papillomatosis. *Archives of* Otolaryngology-Head *&* Neck Surgery*, 132,* 711-715.

Markowitz, L. (2007). HPV vaccines - prophylactic, not therapeutic. *The Journal of the American Medical Association, 298,* 805-806.

Markowitz, L., Dunne, E., Saraiya, M., Lawson, H., Chesson, H., & Unger, E. (2007). Quadrivalent Human Papillomavirus Vaccine. Recommendations of the Advisory

Committee on Immunization Practices. *CDC: Morbidity and Mortality Weekly Reports 56,* 1–24. Retrieved http://www.cdc.gov/ mmwr/preview/mmwrhtml/rr5602a1. htm

Marlow, L., Waller, J., & Wardle, J. (2007). Parental attitudes to pre-pubertal HPV vaccination. *Vaccine, 25,* 1945-1952.

Marra, F., Cloutier, K., Oteng, B., Marra, C., & Oglivie, G. (2009). Effectiveness and cost effectiveness of human papillomavirus vaccine: A systematic review. *Pharmacoeconomics, 27,* 127-147.

Martinez,G., Chandra, A., Abma J., Jones, J., Mosher, W. (2006). Fertility, contraception, and fatherhood: data on men and women from Cycle 6 (2002) of the National Survey of Family Growth. *Center for Health Statistics. Vital and Health Statistics 23(26)*, 1-142

Maw, R., Reitano, M., & Roy, M. (1998). An international survey of patients with genital warts: Perceptions regarding treatment and impact on lifestyle. *International Journal of STD & AIDS, 9*(10), 571-578.

Mayo Foundation for Medical Education and Research. (2010a). *Mouth cancer.* Retrieved from http://www.mayoclinic.com/health/mouth-cancer/DS01089

Mayo Foundation for Medical Education and Research. (2010b). *Throat cancer.* Retrieved from http://www.mayoclinic.com/health/oral-and-throat-cancer/DS00349

Mays, R., Strum, I., & Zimmet, G. (2004a). Recommending STI vaccination to parents of adolescents: The attitudes of nurse practioners. *Journal of Sexually Transmitted Diseases, 31,* 428-432.

Mays, R., Strum, I., & Zimmet, G. (2004b). Parental perspectives on vaccinating children against sexually transmitted infections. *Social Science and Medicine, 58,* 1405-1413.

Mays, R., Zimet, G., Winston, Y., Kee, R., Dickes, J., & Su, L. (2000).Human papillomavirus, genital warts, Pap smears, and cervical cancer: Knowledge and beliefs of adolescents and adult women. *Health Care for Women International 5,* 361-374.

Medeiros, L., Rosa, D., da Rosa, M., Bozzetti, M., & Zanini, R. (2009). Efficacy of human papillomavirus vaccines: a systematic quantitative review. *International Journal of Gynecological Cancer, 19*(7), 1166-76.

MedicineNet.com. (2010). *HPV virus in men.* Retrieved from http://medicine net.com/genital_ warts_in_men_hpv_virus/article.htm.

Merabishvili, V. (2006). Survival of oncologic patients. Saint Petersburg, Russia: IPK Bionit.

McCullers, J. (2007). Evolution, benefits, and shortcomings of vaccine management. *Supplement to Journal of Managed Care Pharmacy. Journal of Managed Care Pharmacy, 13,* S2-S6.

McPartland, T., Weaver, B., Lee, S., & Koutsky, L. (2005). Men's perceptions and knowledge of human papillomavirus (HPV) infection and cervical cancer. *Journal of American College Health, 53,* 225-230.

MedicineNet.com. (2010). *HPV virus in men*. Retrieved from http:// medicinenet.com/genital_ warts_in_men_hpv_virus/article.htm.

Merck & Co, Inc. (2006). *Gardasil – quadrivalent papillomavirus (type 6,11,16,18) recombinant vaccine.* [Brochure].

Montano, D. & Kasoprzyk, D. (2002).The Health Belief Model. In Glanz, K., Rimer, B., & Lewis, F. (Eds.), Health Behavior and Health Education: Theory, Research and Practice (3rd ed.). San Francisco, CA: Joosey-Bass.

Moraros, J., Bird, Y., Barney, D., King, S., Banegas, M, & Suarez-Toriello, E. (2006). A pilot study: HPV infection knowledge and HPV vaccine acceptance among women residing in ciudad Juarez, Mexico. *California Journal of Health Promotion, 4*(3), 177-186.

Moreno, J., Berger, S., & Singer, J. (2006). Don't let politics interfere in the fight against cervical cancer. *Women's Health & Rights.* Retrieved from http://www.americanprogress.org/issues/2006/01/b1335257.html

Mortensen, G. (2010). Drivers and barriers to acceptance of human-papillomavirus vaccination among young women: A qualitative and quantitative study. *Public Health, 10*(68), 1-14.

Mullins, T., Zimet, G., Rosenthal, S., Morrow, C., Ding, L. Shew, M., … Kahn, J. (2010). Perceptions of STI risk and need for safer sexual behaviors following first HPV vaccination. *Society for Adolescent Health and Medicine 2010 Annual Meeting.* Retrieved from http://www.adolescenthealth.org/AM/Template.cfm?Section=Research_Posters&Template=/CM/ContentDisplay.cfm&ContentID=2119

Munoz, N., Bosch, F., Castellsague X., Diaz, M., de Sanjose, S., Hammouda, D. … Meijer, C. (2004) Against which human papillomavirus types shall we vaccinate and screen? The international perspective. *International Journal of Cancer, 111,* 278-285.

Munoz, N., Castellsague, X., de Gonzalez, A., &. Gissman, L. (2006). Chapter 1: HPV in the etiology of human cancer. *Vaccine, 24*(3), S1-S10.

Munoz, N., Bosch, F., de Sanjose, S., Herrero, R., Castellsague, X., Shah, K. … Meijer, M. (2003). Epidemiologic classification of human papillomavirus types associated with cervical cancer. *New England Journal of Medicine, 348,* 518-527.

Munoz, N., Manalastas, R., Pitisuttithum, P., Tresukosol, D., Monsonegro, J., Ault, K. … Saah, A. (2009). Safety, immunogenicity, and efficacy of quadrivalent human papillomavirus

(types 6, 11, 16, 18) recombinant vaccine in women aged 24-45 years: A randomized, double-blind trial. *Lancet, 373,* 1949-1957.

Munsell, D., Gray, C., Reed, J., Vasquez, J. & Vlasak, J. (2010). A study of women and mothers' of minor-age daughters knowledge of HPV as well as the attitudes toward the HPV vaccine. *Internet Journal of Academic Physician Assistants, 7*(2), 1-22. Retrieved from http://web.ebscohost. com/ehost/delivery?vid=22&hid=112&sod=2f7f

Nasca, M., Innocenzi, D., & Micali, G. (2005). Association of penile lichen sclerosus and oncogenic human papillomavirus infection. *International Journal of Dermatology, 45,* 681-683.

National Board of Health News Centre. (2009). *Focus on cancer: Massive uptake of HPV vaccination.* Retrieved from http://www.sst.dk/Nyhed center/Nyhedsbreve /Nyt% 20o m%20kraeft/Nr%201%20April%202009.aspx?item={CC3D9876-CC03-4111-AFC0-0023FFD78TF4.

National Cancer Institute. (2008). *Cervical cancer.* Retrieved from http://www.cancer.gov/ cancerinfo/types/cervical

National Cancer Institute. (n.d.a). *Cervical cancer.* Retrieved from http://www.cancer.gov/cancer topics/types/cervical

National Cancer Institute. (n.d.b). *Surveillance Epidemiology and End Results (SEER) stat fact sheets: Anal cancer.* Retrieved from http://seer.cancer.gov/statfacts/html/anus.html

National Cancer Institute. (n.d.c). *Human papilloma virus (HPV) vaccines.* Retrieved from http://www.cancer.gov/cancertopics/factsheet/prevention/HPV-vaccine

National Institute of Allergy and Infectious Diseases. (2010). *Human papillomavirus (HPV) and genital warts.* Retrieved from http://www.niaid.nih.gov/topics/genitalwarts/pages/default.aspx

National Institute of Allergy and Infectious Diseases. (n.d.). *Human papillomaviruses and cancer: Questions and answers.* Retrieved from http://www.cancer.gov/cancertopics/factsheet/risk/HPV

National Vaccine Advisory Committee. (2003). Standards for child and adolescent immunization practices. *Pediatrics, 112,* 958-963.

Neuman, W. (2003). *Social Research Methods: Quantitative and Qualitative* (7th ed.). Toronto: Allyn and Bacon.

Noakes, K., Yarwood, J., & Salisbury, D. (2006). Parental response to the introduction of a vaccine against human papilloma virus. *Human Vaccines, 2,* 243-248.

Nobelius, A., Kalina, B., Pool, R., Whitworth, J., Chester, J., & Power, R. (2012). "The young ones are the condom generation": Condom use amongst out-of-school adolescents in rural southwest Uganda. *Journal of Sex Reseach, 49*(1), 88-102.

Novikov, A. (2006). In brief about human papilloma virus (HPV). *Multi-profile Clinic: Center of Endosurgery and Lithotripsy.* Retrieved from http://www.celt.ru/articles/art/art_102.phtvml

Nulty, D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education, 33*(3), 301–314.

Ogilvie, G., Marra, F., Remple, G., McNeil, S., Naus, M., Pielak, K. … Patrick, D. (2007). Intention of parents to have daughters receive the human Papillomavirus vaccine. *Canadian Medical Association Journal, 177,* 1506-1512.

Ogilvie, G., Remple, V., McNeil, S., Marra, F., Naus, M., Pielak, K. … Patrick, D. (2008). Intention of parents to have male children receive the human Papillomavirus vaccine *Sexually Transmitted Infections*, 84, 318-323.

Olshen, E., Woods, E., Austin, S., Luskin, M., & Baucher, H. (2005). Parental acceptance of the human papillomavirus vaccine. *Journal of Adolescent Health*, *37,* 248-51.

Olofinlade, O., Adeonigbagbe, O., Gualtieri, N., Gingold, B., Berlin, I., & Sayeed, R. (2000). Anal carcinoma: A 15-year retrospective analysis. *Scandinavian Journal of Gastroenterology, 11,* 1194-1199.

O'Mahony, C. (2005). Genital warts: Current and future management options. *American Journal of Clinical Dermatology, 6*(4), 239-243.

Paavonen, J., Jenkins, D., Bosch, F., Naud, P., Salmeron, J., Wheeler, C. … Dubin, G. (2007). Efficacy of a prophylactic adjuvanted bivalent L1 virus-like-particle vaccine against infection with human papillomavirus types 16 and 18 in young women: an interim analysis of a phase III double-blind, randomized controlled trial. *Lancet, 369*(9580), 2161-2170.

Paavonen, J., Naud, P., Salmerón, J., Wheeler, C., Chow, S., Apter, D. … Dubin, G. (2009). Efficacy of human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine against cervical infection and precancer caused by oncogenic HPV types (PATRICIA): final analysis of a double-blind, randomized study in young women. *Lancet, 374*(9686), 301-314.

Painter, J., Borba, C., Hynes, M., Mays, D., & Glanz, K. (2008). The use of theory in health behavior research from 2000 to 2005: a systematic review. *Annals of Behavioral Medicine, 35*(3), 358–362.

Palefsky, J. (2007). HPV infection in men. *Disease Markers*, *23*(4), 261-272.

Palefsky, J., Holly, E., Ralston, M., Jay, N., Berry, J., Darragh, T. (1998). High incidence of anal high-grade squamous intraepithelial lesions among HIV-positive and HIV-negative homosexual and bisexual men. *AIDS, 12,* 495-503.

Parkin, D. & Bray, F. (2006). Chapter 2: The burden of HPV related cancers. *Vaccine, 24(3),* S11-S25.

Peat, J., Mellis, C., Williams, K., & Xuan, W. (2002). *Health Science Research: A Handbook of Quantitative Methods.* Thousand Oaks, CA: Sage Publication Ltd.

Petaja, T., Keranen, H., Karppa, T., Kawa, A., Lantela, S., Siitari-Mattila, M. … Dubin G. (2009). Immunogenicity and safety of human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine in healthy boys aged 10-18 years. *Journal of Adolescent Health, 44*(1), 33-40.

Philips, C. (2009). What is QALY? *Health Economics.* Hayward Medical Communications, a division of Hayward Group Ltd., 6.

Pitts, M. & Clarke, T. (2002). Human papillomavirus infections and risks of cervical cancer: What do women know? *Health Education Research, 17,* 706–714.

Polit, D. & Hungler, B. (1995). *Nursing Research: Principles and Methods.* Philadelphia, PA: J.B. Lippincott.

Pollack, A., Balkin, M., Edouard, L., Cutts., F., & Broutet, N. (2007). Ensuring access to HPV vaccines through integrated services: A reproductive health perspective. *Bulletin of the World Health Organization, 85*(1), 57-63.

Poston, S. (2009). Family and peer communication as determinants of human papillomavirus vaccination uptake. *Dissertation.* University of Alabama, Alabama, 85.

Raley, J., Followwill, K., Zimet, G., & Ault, K. (2004). Gynecologists' attitudes regarding human papilloma virus vaccination: A survey of fellows of the American College of Obstetricians and Gynecologists. *Infectious Diseases in Obstetrics and Gynecology, 12,* 127-133.

Ramirez, J., Ramos, D., Clayton, L., Kanowitz, S., & Moscicki, A. (1997). Genital human papilloma virus infections: Knowledge, perceptions of risk, and actual risk in a nonclinic population of young women. *Journal of Women's Health, 6,* 113-121.

Reis, L., Eisner, M., Kosary, C., Hankey, B, Miller, B., Clegg, L. & Edwards, B., eds. (2002). *SEER cancer statistics review, 1973–1999.* Bethesda, MD: National Cancer Institute.

Reisinger, K., Block S., Lazcano-Ponce E., Samakoses, R., Esser, M., Erick. J. … Barr, E. (2007). Safety and persistent immunogenicity of a quadrivalent human papillomavirus types 6, 11, 16, 18 L1 virus-like particle vaccine in preadolescents and adolescents: A randomized controlled trial. *The Pediatric Infectious Disease Journal, 26*(3), 201-209.

Reissing, E., Andruff, H., & Wentland, J. (2012). Looking back: The experience of first sexual intercourse and current sexual adjustment in young heterosexual adults. *Journal of Sex Research, 49*(1), 27-35.

Reiter, P., Brewer, N., Gottlieb, S., McRee, A., & Smith, J. (2009). Parents' health beliefs and HPV vaccination of their adolescent daughters. *Social Science and Medicine,* 1-6.

Reiter, P., Brewer, N., McRee, A., Gilbert, P., & Smith, J. (2010). Acceptability of HPV vaccine among a national sample of gay and bisexual men. *Sexually Transmitted Diseases, 37*(3), 197-203.

Robb-Nichloson, C. (2007). A doctor talks about HPV vaccination. (Cover story). *Harvard Women's Health Watch*, *14,* 1-2.

Rose, K. & Ayad, S. (2008). Factors associated with changes in knowledge and attitude towards public health concepts among chiropractic college students enrolled in a community health class. *The Journal of Chiropractic Education, 22*(2), 127-137.

Rosenstock, I. (1974). What research in motivation suggests for public health? *American Journal of Public Health, 50,* 295-301.

Rosenstock, I. (1960). Historical origins of the Health Belief Model. *Health Education Monographs, 2,* 328-335.

Rosenstock, I., Strecher, V., & Backer, M. (1988). The health belief model and HIV risk behavior change. In J. Peterson & DiClemente (Eds.), *Preventing AIDS: Theory and practice of behavior interventions.* New York: Plenum Press.

Rosenthal, S. & Stanberry, L. (2005). Parental accessibility of vaccines for sexually transmitted infections. *Archives of Pediatric and Adolescent Medicine*, *159,* 190-191.

Rosenthal, S., Rupp, R., Zimet, G., Meza, H., Loza, M., Short, M., & Succop, P. (2008). Uptake of HPV vaccine: Demographics, sexual history, and values, parenting style, and vaccine attitudes. *Journal of Adolescent Health, 43,* 239-245.

Sanders, G. & Taira, A. (2003). Cost effectiveness of a potential vaccine for human papillomavirus. *Emerging Infectious Diseases, 9,* 37-48.

Sankaranarayanan, R. (2009). HPV vaccination: The promise and problems. *Indian Journal of Medical Research, 130,* 322-326.

Sarvela, P. & McDermott, R. (1993). *Health Education Evaluation and Measurement: A Practitioner's Perspective.* Madison, WI: Brown & Benchmark.

Satyaprakash, A., Creed, R., Ravanfar, P., & Mendoza, N. (2009). Human papillomavirus vaccines. *Dermatology and Therapy, 22*(2), 150-7.

Sawaya, G. & Smith-McCune, K. (2007). HPV vaccination – more answers, more questions. *The New England Journal of Medicine, 356,* 1991-1993.

Schiller, J. & Davies, P. (2004). Delivering on the promise: HPV vaccines and cervical cancer. *Nature Reviews Microbiology, 2,* 343-347.

Schmiedeskamp, M. & Kockler, D. (2006). New drug development. Human papilloma virus vaccines. *The Annals of Pharmacotherapy, 40,* 1344-1352.

Schwarz, J. (2010). HPV vaccination's second act: Promotion, competition, and compulsion. *American Journal of Public Health, 100*(10), 1841-1844.

Schwarz, T. & Leo, O. (2008) Immune response to human papillomavirus after prophylactic vaccination with AS04adjuvanted HPV-16/18 vaccine: Improving upon nature. *Gynecologic Oncology, 110,* S1–S10

Shikarya, T., Bernsteina, D., Jin, Y., Zimet, G., Rosenthal, S., & Kahn, J. (2009). Epidemiology and risk factors for human papillomavirus infection in a diverse sample of low-income young women. *Journal of Clinical Virology, 46,* 107–111.

Shin, H., Franceschi., S., & Vaccarella, S. (2004). Prevalence and determinants of genital infection with papillomavirus, in female and male university students in Busan, South Korea. *Journal of Infectious Diseases, 190,* 468-476.

Shin, H., Franceschi., S., Vaccarella, S., Roh, J., Ju, Y., Oh, J., … Quint, W. (2004). Prevalence and determinants of genital infection with papillomavirus, in female and male university students in Busan, South Korea. *Journal of Infectious Diseases, 190,* 468-476.

Shoemaker, D., Jiang, P., Williamson, H., & Roland, W. (2007). Infectious diseases. R. Rakel (Ed.), *Textbook of Family Medicine,* (7th ed.). Philadelphia, PA: Saunders Elsevier.

Simatherai, D., Bradshaw, C., Fairley, C., Bush, M., Heley, S., & Chen, M. (2009). What men who have sex with men think about human papillomavirus vaccine. *Sexually Transmitted Infections, 85,* 148-149.

Singh, G., Miller, B., Hankey, B., & Edwards, B. (2004). Persistent area socioeconomic disparities in U.S. incidence of cervical cancer, mortality, stage, and survival, 1975-2000. *Cancer, 101*(5), 1051-1057.

Slade, B., Leidel, L., Vellozzi, C., Woo, E., Hua, W., Sutherland, A. … Iskander, J. (2009) Postlicensure safety surveillance for quadrivalent human papillomavirus recombinant vaccine. *Journal of the American Medical Association*, *302*(7), 750–757.

Slomovitz, B., Sun, C., Frumovitz, V., Soliman, P., Schmeler, K., Pearson, H. … Bodurka, D. (2006). Are women ready for the HPV vaccine? *Gynecologic Oncology, 103,* 151-154.

Steinbrook, R. (2006). *The potential of human papillomavirus vaccines.* New England Journal of Medicine*, 354*(11), *1109–1112.*

Schwarz, T. & Leo, O. (2008). Immune response to human papillomavirus after prophylactic vaccination with AS04-adjuvanted HPV-16/18 vaccine: improving upon nature. *Gynecologic Oncology, 110*(3), S1-S10.

The Digene HPV Test. (2009). *FAQs for men: What men need to know about HPV*. Retrieved from http://www.the hpvtest.com/About-HPV/FAQs-for-Men.html.

The Future II Study Group. (2007).Quadrivalent vaccine against human papillomavirus to prevent high-grade cervical lesions. *New England Journal of Medicine*, *356*(19), 1915–1927.

The Henry H. Kiser Family Foundation. (2008). HPV vaccine: implementation and financing policy in the U.S. *Facts Sheet: Women's Health Policy Facts,* 2.

Tovar, J., Bazaldua, O., Vargas, L., & Reile, E. (2008). Human papillomavirus, cervical cancer, and the vaccines. *Postgraduate Medical Journal, 120*(2), 79-84.

Tsui, L., & Nicholadis, T., (2004). Losing it: Similarities and differences in first intercourse experiences of men and women. *Canadian Journal of Human Sexuality, 13,* 95-107.

Turchik, J. & Gidycz, C. (2012). Exploring the intention-behavior relationship in the prediction of sexual risk behaviors: Can it be strengthened? *Journal of Sex Research, 49*(1), 50-60.

United Nations Population Fund (UNFPA) (n.d.). *UNFPA and adolescents.* Retrieved from http://web.unfpa.org/icpd/icpd5/meetings/ny_adolescent/reports/adoles.htm

University of California Los Angeles (n.d.). *SPSS FAQ: What does Cronbach's alpha mean?* Retrieved from http://www.ats.ucla.edu/stat/spss/faq/alpha. html.

Vamos, C., McDermott, R., & Daley, E. (2008). The HPV vaccine: Framing the arguments for and against mandatory vaccination of al middle school girls. *Journal of School Health, 78*(6), 302-309.

Van de Velde, N., Brisson, M., & Boily, M. (2007). Modeling human papillomavirus effectiveness: Quantifying the impact of parameter uncertainty. *American Journal of Epidemiology, 165,* 762-775.

Vardeman, J. (2008). How teen girls and parents make meaning of a cervical cancer vaccine campaign: Toward a feminist, multicultural critique of health communication. *Dissertation.* University of Maryland, College Park, 400.

Vetter, K. & Geller, S. (2007). Moving forward: Human papillomavirus vaccination and the prevention of cervical cancer. *Journal of Women's Health, 16*(9), 1258-1268.

Villa, L., Costa, R., Petta, C., Andrade, R., Ault, K., Giuliano, A. … Barr, E. (2005). Prophylactic quadrivalent human papillomavirus (types 6, 11, 16, and 18) L1 virus-like

particle vaccine in young women: A randomized double-blind placebo-controlled multicentre phase II efficacy trial. *Lancet Oncology, 6,* 271-278.

Villa, L., Ault, K., Giuliano, A., Costa, R., Petta, C., Andrade, R. … Barr, E. (2006a). Immunologic responses following administration of a vaccine targeting human papillomavirus types 6, 11, 16, and 18. *Vaccine, 24,* 5571-5583.

Villa, L., Costa, R., Petta, C. Andrade, R., Paavonen, J., Iversen, O. ... Barr. E. (2006b). High sustained efficacy of a prophylactic quadrivalent human papillomavirus types 6/11/16/18 virus-like particle vaccine through 5 years of follow-up. *British Journal of Cancer, 95,* 1459-1466.

Wallboomer, J., Jacobs, M., Manos, M., Bosch, F., Kummer, J., Shah, K. … Munoz, N. (1999). Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *The Journal of Pathology, 189*(1), 12-19.

Waller, J., Marlow, L., & Wardle, J. (2006). Mothers' attitudes toward preventing cervical cancer through human papillomavirus vaccination: A qualitative study. *Cancer Epidemiology, Biomarkers and Prevention, 15,* 1257-1261.

Waller, McCaffery, K., Forrest, S., Szarewski, A., Cadman, L., & Wardle, J. (2003). Awareness of human papillomavirus among women attending a well woman clinic. *Sexually Transmitted Infections, 79,* 320-322.

Watson, M., Saraiya, M., Benard, V., Coughlin, S., Flowers, L., Cokkinides, V. … Giuliano, A. (2008). Burden of cervical cancer in the United States, 1998-2003. *Cancer, 113*(10), S2855-S2864.

WebMD. (2009). *HPV infection in men.* Retrieved from http://www.webmd.com/sexual-conditions/hpv-gential-warts/hpv-virus-men.

WebMD. (2011). *Children's Vaccines Health Center: Should your child get the HPV Vaccine?* Retrieved from http://children.webmd.com/vaccines/ features/should-your-child-get-hpv-vaccine?page=3

Wei, Y. Sangweni, N., Butts, G., & Merlino, M. (2001). Factors affecting immunization status of college students in New York City (NYC). *Social Work in Health Care, 33*(1), 87-100.

Wellings, K., Nanchahal, K., Macdowall, W., McManus, S., Erens, B., Mercer, C. … Field, J (2001). Sexual behavior in Britain: Early heterosexual experience. *Lancet, 358,* 1843-1850.

Wetzel1, C., Tissot, A., Kollar, L., Hillard, P., Stone, R., & Kahn, J. (2007). Development of an HPV educational protocol for adolescents. *Journal of Pediatric and Adolescent Gynecology, 20(5)*, 281–287.

Wiatrak, B., Wiatrak, D., Broker, T., & Lewis, I. (2004). Recurrent respiratory papillomatosis: A longitudinal study comparing severity associated with human papilloma viral types 6 and 11 and other risk factors in a large pediatric population. *Laringoscope, 114,* 1-23.

Women in Government (2008). The "state" of cervical cancer prevention in America, *Report,* 1-70.

Woodhall, S., Lehtinen, M., Verho, T., Huhtala, H., Hokkanen, M., & Kosunen, E. (2007). Anticipated acceptance of HPV vaccination at the baseline of implementation: A survey of parental and adolescent knowledge and attitudes in Finland. *Journal of Adolescent Health, 40,* 466-469.

Woodwell, D. & Cherry, D. (2004) *National ambulatory medical care survey: 2002 Summary. Advance data from vital and health statistics; no 346.* Hyattsville, MD: National Center for Health Statistics.

World Health Organization (WHO). (n.d.). *Information center on HPV and cervical cancer.* Retrieved from http://www.who.int/hpvcentre/publications/en/.

World Health Organization (WHO). (2006). New vaccines against infectious diseases: Research and development status. *Initiative for Vaccine Research,* 1-7.

World Health Organization (WHO). (2008). Preparation for the implementation of HPV vaccine in European region of WHO. *Strategic Document of Controllable Infections and Immunizations Program,* 1-52.

World Health Organization (WHO). (2011). *Smallpox.* Retrieved from http://www.who.int/mediacentre/factsheets/smallpox/en/

World Health Organization/International Agency for Research on Cancer (WHO/IARC). (2008). *GLOBOCAN 2008: Cancer incidence and mortality worldwide in 2008.* Retrieved from http://globocan.iarc.fr/

World Health Organization/Institute Català d'Oncologia (WHO/ICO). (2010). Human papilloma virus and related cancers. *Summary Report.* Retrieved from http://apps.who.int/hpvcentre/statistics/dynamic/ico/country_ pdf/RUS.pdf?CFID=4005139&CFTOKEN=50211239

Yacobi, E., Tennant, C., Ferrante, J., Pal, N., & Roetzheim, R. (1999). University students' knowledge an awareness of HPV. *Preventive Medicine, 28,* 535-541.

Zimet, G. (2005). Improving adolescent health: Focus on HPV vaccine acceptance. *Journal of Adolescent Health, 37,* 17-23.

Zimet, G., Liddon, N., Rosenthal, S., Lazcano-Ponce, E., & Allen, B. (2006). Chapter 24: Psychosocial aspects of vaccine acceptability. *Vaccine, 24*(3), S201-S209.

Zimet, G., Mays, M., Sturm, L., Ravert, A., Perkins, S., & Juliar, B. (2005). Parental attitudes about sexually transmitted infection vaccination for their adolescent children. *Archives of Pediatrics & Adolescent Medicine, 159,* 132-137.

Zimet, G., Mays, M., Winston, Y., Kee, R., Dickes, J., & Su, L. (2000). Acceptability of human papillomavirus immunization. *Journal of Women's Health & Gender-Based Medicine*, 9, 47–50.

Zimmerman, R. (2006). Ethical analysis of HPV vaccine policy options. *Vaccine, 24,* 4812-482.

APPENDICES

Appendix A

Survey Instrument English version

HPV, HPV-associated diseases, and HPV STUDY

Thank you for agreeing to be in this study!

Please read the items on this survey carefully and answer them as best as you can.

If a question makes you feel uncomfortable, you may skip it.

Your answers will be kept anonymous –
no one will be able to link your name to your answers.

1. Please, indicate your gender: male ☐$_1$ female ☐$_2$

These questions ask how you feel about vaccines. Please read the statements and *CHECK* ☑ the box that best shows how much you agree or disagree with the statements. Check only *ONE* box for each statement.

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
2. Shots are very painful.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
3. Needles don't bother me at all.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
4. I am not afraid of shots.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
5. HPV vaccine shots are can lead to serious side effects	☐$_1$	☐$_2$	☐$_3$	☐$_4$
6. The HPV vaccine can make people very sick.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
7. One can get infected with HPV from the HPV vaccine shots.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
8. Getting vaccine shots against HPV would be a good way to protect my health.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
9. One way for me to stay healthy would be to get the vaccine shots to prevent infection with HPV.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
10. It would be hard for me to find time to get vaccinated for HPV.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
11. It would be hard for me to get transportation for 3 appointments to get vaccinated for HPV.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
12. It would be easy for me to get to a clinic for the 3 shots of HPV vaccine.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
13. The HPV vaccine will protect me against cervical (penile) cancer.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
14. The HPV vaccine will protect me against anal cancer.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
15. The HPV vaccine will protect me against oral and throat cancer.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
16. The HPV vaccine will protect me against genital warts.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
17. Getting the HPV vaccine would protect my sexual partner(s) against HPV infection	☐$_4$	☐$_3$	☐$_2$	☐$_1$
18. The HPV vaccine is too expensive for me.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
19. Asking for the HPV vaccine would be embarrassing.	☐$_1$	☐$_2$	☐$_3$	☐$_4$
20. Deciding whether I should get the vaccine would be difficult without knowing more about **HPV.**	☐$_1$	☐$_2$	☐$_3$	☐$_4$
21. Deciding whether I should get the vaccine would be difficult without knowing more about ***the vaccine.***	☐$_1$	☐$_2$	☐$_3$	☐$_4$
22. I will get HPV vaccine if my doctor recommends me to get it.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
23. I will get HPV vaccine if my parents wish me to get it.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
24. Most of the people I know would think that HPV vaccines are good for your health.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
25. I will get HPV vaccine if my partner (or a future partner if I don't have on now) would like me to get it.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
26. I will get HPV vaccine if my friends suggest me to get it. 2	☐$_4$	☐$_3$	☐$_2$	☐$_1$
27. The possibility of getting infected with HPV concerns me.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
28. I don't worry about the possibility of getting infected with HPV.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
29. The possibility of getting genital warts concerns me.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
30. The possibility of getting cervical (penile) cancer concerns me.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
31. The possibility of getting anal concerns me.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
32. The possibility of getting oral and/or throat cancer concerns me.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
33. HPV will increase my risk of genital warts.	☐$_4$	☐$_3$	☐$_2$	☐$_1$
34. HPV will increase my risk of cervical (penile) cancer. .	☐$_4$	☐$_3$	☐$_2$	☐$_1$

35. HPV will increase my risk of anal cancer.	☐4	☐3	☐2	☐1
36. HPV will increase my risk of oral and/or throat cancer.	☐4	☐3	☐2	☐1
37. People die from being infected with HPV.	☐4	☐3	☐2	☐1
38. People can get very sick from infection with HPV.	☐4	☐3	☐2	☐1
39. People who are infected with HPV don't have to worry about their health.	☐1	☐2	☐3	☐4
40. Genital warts would be a serious health problem for me.	☐4	☐3	☐2	☐1
41. Cervical (penile) cancer would be a serious health problem for me.	☐4	☐3	☐2	☐1
42. Anal cancer would be a serious health problem for me.	☐4	☐3	☐2	☐1
43. Oral and throat cancer would be a serious health problem for me.	☐4	☐3	☐2	☐1
44. If someone in my family had cervical (penile) cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
45. If someone in my family had anal cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
46. If someone in my family had oral and/or throat cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
47. If someone among my friends had cervical (penile) cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
48. If someone among my friends had anal cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
49. If someone among my friends had oral and/or throat cancer, I will get HPV vaccine.	☐4	☐3	☐2	☐1
50. If I received one dose of HPV vaccine I am protected against HPV and HPV-associated diseases.	☐4	☐3	☐2	☐1
51. If I received two doses of HPV vaccine I am protected against HPV and HPV-associated diseases.	☐4	☐3	☐2	☐1
52. If I received three doses of HPV vaccine I am protected against HPV and HPV-associated diseases.	☐4	☐3	☐2	☐1
53. Unprotected sex practices increase risk of contracting HPV and other sexually transmitted diseases.	☐4	☐3	☐2	☐1

Please read the statements and ***CHECK* ☑ the box that shows whether you think the statement is true or false, or whether you are not sure. Check only *ONE* box for each statement.**

54. If a woman's male sexual partner uses condoms, **she** is completely protected against HPV.	☐1 True	☐0 False	☐88 Not sure
55. If a woman's male sexual partner uses condoms, **he** is completely protected against HPV.	☐1 True	☐0 False	☐88 Not sure
56. If a man's male sexual partner uses condoms, **both** are completely protected against HPV.	☐1 True	☐0 False	☐88 Not sure
57. A person may be infected with HPV and not know it.	☐1 True	☐0 False	☐88 Not sure
58. Most women with HPV have problems with their menstrual periods.	☐1 True	☐0 False	☐88 Not sure
59. HPV can be spread from person to person just by skin to skin genital contact (sexual contact without penetration)	☐1 True	☐0 False	☐88 Not sure
60. In women the HPV infection is found or detected by a Pap test (a *Pap test is when a doctor or nurse inserts an instrument called a speculum into vagina, and uses a small brush to take cells from cervix to check for changes that might lead to cervical cancer*).	☐1 True	☐0 False	☐88 Not sure
61. HPV infection can cause problems getting pregnant.	☐1 True	☐0 False	☐88 Not sure
62. Genital warts always go away permanently if you get the right treatment.	☐1 True	☐0 False	☐88 Not sure
63. HPV can sometimes be cured with antibiotics.	☐1 True	☐0 False	☐88 Not sure
64. Women with HPV may need to get Pap tests more often than those without HPV.	☐1 True	☐0 False	☐88 Not sure
65. Girls and women who have received an HPV vaccine don't need Pap tests anymore.	☐1 True	☐0 False	☐88 Not sure

Imagine that you have an HPV infection. Please read the statements below and next to each statement *CHECK* ☑ the box that best shows how much you agree or disagree with it. Check only *ONE* box for each statement.

If I were to have an HPV infection:	**Strongly agree**	**Somewhat agree**	**Somewhat disagree**	**Strongly disagree**
66. People at school or work would discriminate against me.	☐4	☐3	☐2	☐1
67. Some people would act as though I am less competent (capable) than usual.	☐4	☐3	☐2	☐1
68. I would be treated with less respect than usual by others.	☐4	☐3	☐2	☐1
69. I feel others would be concerned they could catch HPV through contact like a handshake or eating food I prepare.	☐4	☐3	☐2	☐1
70. I feel others would avoid me because of my HPV infection.	☐4	☐3	☐2	☐1
71. Some family members would reject me because of my HPV infection.	☐4	☐3	☐2	☐1
72. Some friends would reject me because of my HPV infection	☐4	☐3	☐2	☐1
73. Others would feel awkward and tense when they are around me.	☐4	☐3	☐2	☐1
74. I would feel others think I am to blame for my HPV infection.	☐4	☐3	☐2	☐1
75. I would not feel I could be open with others about my HPV infection.	☐4	☐3	☐2	☐1
76. I would fear someone telling others about my HPV infection without my permission.	☐4	☐3	☐2	☐1
77. I would feel that I need to keep my HPV infection a secret.	☐4	☐3	☐2	☐1
78. I would feel I am at least partially to blame for my HPV infection.	☐4	☐3	☐2	☐1
79. I would feel set apart from others who are well.	☐4	☐3	☐2	☐1
80. I would have a greater need than usual for reassurance that others care about me.	☐4	☐3	☐2	☐1
81. I would feel lonely more often than usual.	☐4	☐3	☐2	☐1
82. Because of the HPV infection, I would have a sense of being unequal in my relationships with others.	☐4	☐3	☐2	☐1
83. I would feel less competent (capable) than I did before my HPV infection.	☐4	☐3	☐2	☐1
84. Due to the HPV infection, I would sometimes feel useless.	☐4	☐3	☐2	☐1
85. Changes in my appearance would affect my social relationships.	☐4	☐3	☐2	☐1

Please read the statements and *CHECK* ☑ the box that shows the right answer for you. Remember, your answers are confidential and will not be linked to your name or any other information that could identify you.

86. Have you ever received HPV vaccine (all three doses)? ☐1 Yes ☐0 No ☐88 Not sure

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
The next 5 items ask how confident you are that you could get vaccinated against HPV during the next year, if you wanted to.				
87. I am confident that getting HPV vaccine could help me to stay healthy.	☐4	☐3	☐2	☐1
88. I am confident that I will get vaccinated against HPV next year.	☐4	☐3	☐2	☐1
89. I am confident that I could get vaccinated completely against HPV (that is, get all three vaccine shots).	☐4	☐3	☐2	☐1
90. I am confident that I could find the time to go to your health care provider for three visits to get vaccinated against HPV.	☐4	☐3	☐2	☐1
91. I am confident that I could afford to get vaccinated against HPV (be able to pay for the three vaccine shots)	☐4	☐3	☐2	☐1

92. How old are you? _____ years old

93. What is your marital status?
- ☐1 Never married
- ☐2 Divorced, separated, or widowed
- ☐3 Married (officially registered)
- ☐4 Married (officially is not registered)

94. Are you living with a partner now? ☐0 Yes ☐1 No

95. What was the highest grade/level of school that you finished or degree you have received?
- ☐1 9th grade
- ☐2 High school graduate
- ☐3 Community college
- ☐4 College/University degree
- ☐5 Graduate degree (Master's, professional school, doctoral)

96. Are you covered by health insurance or some other health care plan? ☐1 Yes ☐0 No ☐88 Not sure

Please read the statements and *CHECK* ☑ the box that shows the right answer for you. Remember, your answers are confidential and will not be linked to your name or any other information that could identify you.

97. Have you ever had sexual contact? (*by sexual contact we mean genital, skin-to-skin contact only*)	☐$_1$ Yes (**GO TO #97**) ☐$_0$ No (**SKIP TO #98**)
98. How old were you when you had sexual contact for the first time?	_____ years of age
99. Have you ever had sex? (*by sex we mean oral, vaginal, or anal sex*)	☐$_1$ Yes (**GO TO #99**) ☐$_0$ No (**SKIP TO LAST PAGE)**
100. How old were you when you had sex for the first time *(by sex we mean oral, vaginal, or anal sex*)?	_____ years of age
101. During your life, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex*)?	_____ (number)
102. In the past 3 months, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex*)?	_____ (number)
103. In the past 3 months, have you had ***anal*** sex?	☐$_1$ Yes ☐$_0$ No
104. In the past 3 months, have you had ***oral*** sex?	☐$_1$ Yes ☐$_0$ No
105. In the past 3 months, have you had ***vaginal*** sex?	☐$_1$ Yes ☐$_0$ No
106. In the past 3 months, how often did you use condoms with your sexual partner?	☐$_1$ Never (0%) ☐$_2$ Rarely (20%) ☐$_3$ Sometimes (60%) ☐$_4$ Most of the time (80%) ☐$_5$ Always(100%)
107. The last time you had sex with your sexual partner; did you use a condom?	☐$_1$ Yes ☐$_0$ No

Thank you for answering questions and participating in research!

Appendix B

Survey Instrument Russian Version

Исследовательский опрос: Вирус Папилломы Человека (ВПЧ), заболевания, вызываемые ВПЧ, и ВПЧ вакцина.

Спасибо, что согласились участвовать в данном исследовании

Пожалуйста, внимательно прочтите вопросы и ответьте на них правдиво
Если какой-либо вопрос вызывает у вас дискомфорт, вы можете на него не отвечать и перейти к следующему вопросу

Ваши ответы будут абсолютно анонимны: никто не сможет узнать ваше имя, так как ваше имя не будет нигде указанно.
Таким образом, ваши ответы не будут указывать на ваше имя.

1. Пожалуйста, укажите свой пол: мужской ☐1 женский ☐2

Данные вопросы выясняют ваше отношение к вакцинам и вакцинации. Пожалуйста, прочитайте утверждение и отметьте галочкой ☑ тот ответ, который наиболее соответствует вашему мнению: насколько вы согласны или не согласны с нижеизложенными утверждениями. Выберете только один ответ на каждое утверждение.

	Полностью согласен (а)	Согласен (а), но не в полной мере	Не согласен (а), но не в полной мере	Полностью не согласен (а)
2. Уколы - очень болезненная процедура	☐1	☐2	☐3	☐4
3. Иглы/шприцы не причиняют мне беспокойства	☐4	☐3	☐2	☐1
4. Я не боюсь уколов	☐4	☐3	☐2	☐1
5. ВПЧ вакцинация может привести к серьезным побочным эффектам	☐1	☐2	☐3	☐4
6. После вакцинации ВПЧ люди сильно болеют.	☐1	☐2	☐3	☐4
7. Путём вакцинации ВПЧ люди могут заразиться ВПЧ	☐1	☐2	☐3	☐4
8. ВПЧ вакцинация – это правильная мера для сохранения/защиты моего здоровья	☐4	☐3	☐2	☐1
9. Одна из возможностей для меня быть здоровым (ой) – это вакцинация против ВПЧ инфекции	☐4	☐3	☐2	☐1
10. Для меня будет трудно найти время, чтобы пройти ВПЧ вакцинацию	☐1	☐2	☐3	☐4
11. Для меня будет трудно три раза добраться до клиники для прохождения вакцинации в три этапа.	☐1	☐2	☐3	☐4
12. Мне будет просто три раза добраться до клиники для прохождения вакцинации в три этапа	☐4	☐3	☐2	☐1
13. ВПЧ вакцина защитит меня от рака шейки матки (пениса (полового члена))	☐4	☐3	☐2	☐1
14. ВПЧ вакцина защитит меня от рака анального канала (заднего прохода)	☐4	☐3	☐2	☐1
15. ВПЧ вакцина защитит меня от рака ротовой полости и глотки	☐4	☐3	☐2	☐1
16. ВПЧ вакцина защитит меня от генитальных (половых) кондилом и папиллом (бородавок)	☐4	☐3	☐2	☐1
17.Прохождение ВПЧ вакцинации защитит моего (ю) сексуального (ую) (полового (ую)) партнёра (шу) против ВПЧ инфекции	☐4	☐3	☐2	☐1
18. Стоимость ВПЧ вакцины слишком дорогая для меня	☐1	☐2	☐3	☐4
19. Для меня будет неудобно/стыдно спросить про ВПЧ вакцину	☐1	☐2	☐3	☐4
20. Решиться на вакцинацию мне будет трудно без знаний о ВПЧ	☐1	☐2	☐3	☐4
21. Решиться на вакцинацию мне будет трудно без знаний о вакцине	☐1	☐2	☐3	☐4
22. Я пройду ВПЧ вакцинацию, если мой врач рекомендует мне пройти эту вакцинацию	☐4	☐3	☐2	☐1
23. Я пройду ВПЧ вакцинацию, если мои родители желают, чтобы я прошёл (а) эту вакцинацию	☐4	☐3	☐2	☐1
24. Большинство знакомых мне людей думают, что ВПЧ вакцина полезна для здоровья	☐4	☐3	☐2	☐1
25. Я пройду ВПЧ вакцинацию, если мой партнёр (ша) (моя девушка/мой парень) (или мой будущий партнёр (ша)) хочет (захочет), чтобы я прошёл (а) эту вакцинацию	☐4	☐3	☐2	☐1

26. Я пройду ВПЧ вакцинацию, если мои друзья предложат мне пройти эту вакцинацию	☐4	☐3	☐2	☐1
27.Возможность заразиться ВПЧ меня беспокоит	☐4	☐3	☐2	☐1
28. Я не беспокоюсь о возможности заразиться ВПЧ	☐1	☐2	☐3	☐4
29. Возможность заболеть генитальными (половыми) кондиломами и папилломами (бородавками) меня беспокоит	☐4	☐3	☐2	☐1
30. Возможность заболеть раком шейки матки (раком пениса (полового члена)) меня беспокоит	☐4	☐3	☐2	☐1
31. Возможность заболеть раком анального канала (заднего прохода) меня беспокоит	☐4	☐3	☐2	☐1
32. Возможность заболеть раком ротовой полости и/или глотки меня беспокоит	☐4	☐3	☐2	☐1
33. ВПЧ повышает мой риск заболеть генитальными (половыми) кондиломами и папилломами (бородавками)	☐4	☐3	☐2	☐1
34. ВПЧ повышает мой риск заболеть раком шейки матки (раком пениса (полового члена))	☐4	☐3	☐2	☐1
35. ВПЧ повышает мой риск заболеть раком анального канала (заднего прохода)	☐4	☐3	☐2	☐1
36. ВПЧ повышает мой риск заболеть раком ротовой полости и/или глотки	☐4	☐3	☐2	☐1
37. Люди умирают от заражения ВПЧ	☐4	☐3	☐2	☐1
38. Люди серьёзно заболевают после заражения ВПЧ	☐4	☐3	☐2	☐1
39. Людям, которые заразились ВПЧ не стоит беспокоиться о своём здоровье	☐1	☐2	☐3	☐4
40. В случае заболевания генитальные (половые) кондиломы и папилломы (бородавки) могут представлять для меня серьёзную проблему	☐4	☐3	☐2	☐1
41. В случае заболевания рак шейки матки (рак пениса (полового члена)) будет представлять для меня серьёзную проблему	☐4	☐3	☐2	☐1
42. В случае заболевания рак анального канала (заднего прохода) будет представлять для меня серьёзную проблему	☐4	☐3	☐2	☐1
43. В случае заболевания рак ротовой полости и/или глотки будет представлять для меня серьёзную проблему	☐4	☐3	☐2	☐1
44. Если у кто-то в моей семье болел раком шейки матки (раком пениса (полового члена), я пройду ВПЧ вакцинацию.	☐4	☐3	☐2	☐1
45. Если у кто-то в моей семье болел раком анального канала (заднего прохода), я пройду ВПЧ вакцинацию	☐4	☐3	☐2	☐1
46. Если у кто-то в моей семье болел раком ротовой полости и/или глотки я пройду ВПЧ вакцинацию	☐4	☐3	☐2	☐1
47. Если у кто-то из моих друзей болел раком шейки матки (раком пениса (полового члена), я пройду ВПЧ вакцинацию	☐4	☐3	☐2	☐1
48. Если у кто-то из моих друзей болел раком анального канала (заднего прохода), я пройду ВПЧ вакцинацию	☐4	☐3	☐2	☐1
49. Если у кто-то из моих друзей болел раком ротовой полости и/или глотки я пройду ВПЧ вакцинацию	☐4	☐3	☐2	☐1
50. Если я получил(а) одну дозу ВПЧ вакцины, я защищен(на) от заболеваний ,				

связанных с ВПЧ	☐1	☐2	☐3	☐4
51. Если я получил(а) две дозы ВПЧ вакцины, я защищен(на) от заболеваний , связанных с ВПЧ	☐1	☐2	☐3	☐4
52. Если я получил(а) три дозы ВПЧ вакцины, я защищен(на) от заболеваний , связанных с ВПЧ	☐4	☐3	☐2	☐1
53. Незащищенный секс повышает риск заражения ВПЧ и другими инфекциями, передающимися половым путем	☐4	☐3	☐2	☐1

Пожалуйста, прочитайте утверждение и отметьте галочкой ☑ тот ответ, который по вашему мнению правильный, не правильный или вы не уверены / не знаете. Выберете только один ответ на каждое утверждение.

54. Если мужчина - сексуальный (половой) партнёр женщины использует презерватив, **она** полностью защищена от заражения ВПЧ .	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
55. Если мужчина - сексуальный (половой) партнёр женщины использует презерватив, **он** полностью защищен от заражения ВПЧ.	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
56. Если мужчина - сексуальный (половой) партнёр мужчины использует презерватив, **оба** полностью защищены от заражения ВПЧ	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
57. Человек может быть заражён ВПЧ и может об этом не знать	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
58. У большинства девушек/женщин, заражённых ВПЧ, нарушается менструальный цикл	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
59. ВПЧ передаётся от человека к человеку через кожно-генитальный (кожно-половой контакт)	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
60. У девушек/женщин ВПЧ инфекция часто выявляется при сдаче мазка с шейки матки *(мазок на атипию (мазок по Папаниколау) сдаётся, когда акушер-гинеколог вставляет гинекологическое зеркало во влагалище и, используя специальную маленькую щёточку, снимает мазок с шейки матки для выявление изменений на клеточном уровне, которые могут указывать на предраковые или раковые изменения шейки матки)*	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
61. ВПЧ инфекция может препятствовать наступлению беременности	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
62. В случае заражения генитальные (половые) кондиломы и папилломы (бородавки) могут полностью исчезать при прохождении соответствующего лечения	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
63. ВПЧ может иногда излечиваться антибактериальной терапией (антибиотиками)	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
64. Девушки/женщины, заражённые ВПЧ, возможно нуждаются в более частом сдачи мазка с шейки матки (мазок на атипию), по сравнению с теми, у кого нет ВПЧ инфекции	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить
65. Девушки/женщины, прошедшие ВПЧ вакцинацию, более не нуждаются в сдаче мазка с шейки матки (мазок на атипию)	☐1 Верно	☐0 Неверно	☐88 Затрудняюсь ответить

Представьте, что вы заражены ВПЧ инфекцией. Пожалуйста, прочитайте утверждение и отметьте галочкой ☑ тот ответ, который наиболее соответствует вашему мнению: насколько вы согласны или не согласны с нижеизложенными утверждениями. Выберете, только один ответ на каждое утверждение.

Если бы я был(а) заражён (а) ВПЧ инфекцией:	**Полностью согласен (а)**	**Согласен (а), но не в полной мере**	**Не согласен (а), но не в полной мере**	**Полностью не согласен (а)**
66. Люди в университете и/или на работе меня притесняли бы	☐4	☐3	☐2	☐1
67. Некоторые люди, стали бы считать меня менее компетентным (ой) / работоспособным(ой) , чем обычно.	☐4	☐3	☐2	☐1

68.Я буду испытывать меньше уважения со стороны других людей, чем обычно.	☐4	☐3	☐2	☐1
69. Я почувствую, что другие люди будут бояться заразиться ВПЧ через контакты, как, например, рукопожатие или употребление пищи моего приготовления.	☐4	☐3	☐2	☐1
70. Я почувствую, что другие люди будут меня избегать из-за моей ВПЧ инфекции.	☐4	☐3	☐2	☐1
71. Некоторые члены моей семьи меня отвергнут из-за моей ВПЧ инфекции.	☐4	☐3	☐2	☐1
72. Некоторые друзья меня отвергнут из-за моей ВПЧ инфекции.	☐4	☐3	☐2	☐1
73 Другие люди будут чувствовать себя неудобно и в напряжении, находясь со мной рядом.	☐4	☐3	☐2	☐1
74. Я почувствую, что другие люди думают, что я сам (а) виноват (а), что заразился (ась) ВПЧ инфекцией.	☐4	☐3	☐2	☐1
75. Я не буду чувствовать, что я могу свободно рассказать другим о моей ВПЧ инфекции	☐4	☐3	☐2	☐1
76. Я буду бояться, что кто-нибудь расскажет другим людям о моей ВПЧ инфекции без моего разрешения.	☐4	☐3	☐2	☐1
77. Я почувствую, что мне нужно держать заражение ВПЧ инфекцией в секрете.	☐4	☐3	☐2	☐1
78. Я почувствую, что, по крайней мере, я частично виновен (ата) в заражении ВПЧ инфекцией.	☐4	☐3	☐2	☐1
79. Я почувствую, что я отдалён (а) / отличаюсь от других людей, которые здоровы.	☐4	☐3	☐2	☐1
80. Мне будет сильнее, чем обычно, необходимо убедиться, что другие люди проявляют заботу обо мне.	☐4	☐3	☐2	☐1
81. Я почувствую себя более одиноким (ой), чем обычно.	☐4	☐3	☐2	☐1
82. Из-за ВПЧ инфекции я буду ощущать неравенство в моих отношениях с другими людьми.	☐4	☐3	☐2	☐1
83. Я почувствую себя менее компетентным (ой) /работоспособным(ой) , чем до заражения ВПЧ инфекцией.	☐4	☐3	☐2	☐1
84. Из-за ВПЧ инфекции иногда я буду чувствовать себя бесполезным человеком.	☐4	☐3	☐2	☐1
85. Изменения в моей внешности / моём облике отрицательно скажутся на моих взаимоотношениях с людьми.	☐4	☐3	☐2	☐1

Пожалуйста, прочитайте утверждение и отметьте галочкой ☑ тот ответ, который наиболее соответствует вашему мнению. Выберете, только один ответ на каждое утверждение. Напоминаем вам, что ваши ответы конфиденциальны и не будут связаны с вашим именем или с любой другой информацией, связанной с вами (ваше имя раскрыто или идентифицировано с вашими ответами не будет).

86. Проходили ли вы когда-либо ВПЧ вакцинацию (все три дозы)? ☐1 Да ☐0 Нет ☐88

	Полностью согласен (а)	**Согласен (а), но не в полной мере**	**Не согласен (а), но не в полной мере**	**Полностью не согласен (а)**
Следующие 5 вопросов о том, насколько вы уверены, что смогли бы пройти вакцинацию в следующем году, если бы захотели это сделать.				
87. Я уверен (а), что ВПЧ вакцинация поможет мне быть здоровым (вой)	☐4	☐3	☐2	☐1
88. Я уверен (а), что пройду ВПЧ вакцинацию в следующем году	☐4	☐3	☐2	☐1
89. Я уверен (а), что смог(ла) бы пройти полную вакцинацию против ВПЧ (пройти все три прививки)	☐4	☐3	☐2	☐1

90. Я уверен (а), что смог(ла) бы найти время, чтобы прийти три раза в прививочный кабинет для прохождения вакцинации против ВПЧ ☐4 ☐3 ☐2 ☐1

91. Я уверен (а), что смог(ла) бы оплатить вакцинацию против ВПЧ (заплатить за все три прививки) ☐4 ☐3 ☐2 ☐1

92. Сколько вам лет? _____лет

93. Вы замужем (женаты)?
☐1 Никогда не была замужем (не был женат)
☐2 Разведен(а) официально, разведен(а) неофициально, или овдовел(а)
☐3 В настоящее время в зарегистрированном браке
☐4 В настоящее время в гражданском браке (сожительствую с партнёром(шей))

94. Проживаете ли вы сейчас вместе со своим партнёром (шей) ☐0 Да ☐1 Нет

95. Какой самый высший (последний) уровень образования вы получили (закончили)?
☐1 9ый класс
☐2 Аттестат о среднем образовании
☐3 Диплом профтех или мед.училища
☐4 Диплом высшего учебного заведения
☐5 Диплом кандидаткой степени /магистратуры/докторантуры

96. Есть ли у вас медицинская страховка? ☐1 Да ☐0 Нет ☐88 Не знаю / не уверен (а)

Пожалуйста, прочитайте утверждение и отметьте галочкой ☑ тот ответ, который наиболее соответствует вашему мнению. Выберете, только один ответ на каждое утверждение. Напоминаем вам, что ваши ответы конфиденциальны и не будут связаны с вашим именем или с любой другой информацией, связанной с вами (ваше имя раскрыто или идентифицировано с вашими ответами не будет).

97. Был ли у вас когда-либо сексуальный контакт? (под сексуальным контактом имеется в виду только генитальный кожный контакт без проникновения во влагалище, в рот и/или анус (задний проход)) ☐1 Да (Переходите к вопросу **#97**) ☐0 Нет (Переходите к вопросу **#98**)

98. Сколько вам было лет, когда у вас был самый первый сексуальный контакт (под сексуальным контактом имеется в виду только генитальный кожный контакт без проникновения во влагалище, в рот и/или анус (задний проход)) _____ лет

99. Был ли у вас когда-либо секс (под сексом имеется в виду влагалищный, оральный и/ или анальный секс) ☐1 Да (Переходите к вопросу **#99**) ☐0 Нет (Переход на последнюю страницу)

100. Сколько вам было лет, когда у вас был самый первый секс (под сексом имеется в виду влагалищный, оральный и/ или анальный секс) _____ лет

101. В течение вашей жизни со сколькими партнерами (шами) у вас был секс (под сексом (половым контактом) имеется в виду влагалищный, оральный и/ или анальный секс) _____ (укажите число)

102. За последние 3 месяца со сколькими партнерами (шами) у вас был секс под сексом (половым контактом) имеется в виду влагалищный, оральный и/ или анальный секс) _____ (укажите число)

103. За последние 3 месяца, был ли у вас **анальный** секс? ☐1 Да ☐0 Нет

104. За последние 3 месяца, был ли у вас **оральный** секс?	☐$_1$ Да	☐$_0$ Нет
105. За последние 3 месяца, был ли у вас **влагалищный** секс?	☐$_1$ Да	☐$_0$ Нет
106. За последние 3 месяца как часто вы использовали презерватив с вашим сексуальный партнёром (шей)		
☐$_1$ Никогда (0%) ☐$_2$ Редко (20%) ☐$_3$ Иногда (60%)	☐$_4$ Почти каждый раз (80%)	☐$_4$ Всегда(100%)
107. Последний раз, когда у вас был секс пользовались ли вы презервативом ?	☐$_1$ Да	☐$_0$ Нет

Спасибо большое за ответы на вопросы и участие в исследовании!

Appendix C

List of Knowledge, Behavior, and Demographic Items in the Survey Instrument

Knowledge, Behavior, and Demographics' items in questionnaire

Knowledge:
If a woman's male sexual partners use condoms, **she** is protected against HPV. (54) no
If a woman's male sexual partners use condoms, **he** is protected against HPV. (55) no
If a man's male sexual partner uses condoms, **both** are completely protected against HPV. (56) no
A person may be infected with HPV and not know it. (57) yes
Most women with HPV have problems with their menstrual periods. (58) no
HPV can be spread from person to person just by skin to skin genital contact (sexual contact without penetration). (59) yes
HPV infection is often found or detected by a Pap test. (60) yes
HPV infection can cause problems getting pregnant.(61) no
Genital warts always go away permanently if you get the right treatment. (62) no
HPV can sometimes be cured with antibiotics. (63) no
Women with HPV may need to get Pap tests more often than those without HPV. (64) yes
Girls and women who have received an HPV vaccine don't need Pap tests anymore. (65) no
Behavior:
Have you ever had sexual contact? (*by sexual contact we mean genital, skin-to-skin contact only)* (97)
How old were you when you had sexual contact for the first time? (98)
Have you ever had sex? (*by sex we mean oral, vaginal, or anal sex*) (99)
How old were you when you had sex for the first time *(by sex we mean oral, vaginal, or anal sex*)? (100)
During your life, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex*)? (101)
In the past 3 months, with how many partners have you had sex *(by sex we mean oral, vaginal, or anal sex*)? (102)
In the past 3 months, have you had ***anal*** sex? (103)
In the past 3 months, have you had ***oral*** sex? (104)
In the past 3 months, have you had ***vaginal*** sex? (105)
In the past 3 months, how often did you use condoms with your sexual partner? (106)
The last time you had sex with your sexual partner; did you use a condom? (107)
Demographics
Please, indicate your gender. (1)
Have you ever received HPV vaccine (all three doses)? (86)
How old are you? (92)
What is your marital status? (93)
Are you living with a partner now? (94)
What was the highest grade/level of school that you finished or degree you have received? (95)
Are you covered by health insurance or some other health care plan? (96)

Appendix D

List of Health Belief Model (HBM) Constructs with Corresponding Items in Survey Instrument

Health Belief Model constructs in questionnaire

Perceived susceptibility:
The possibility of getting infected with HPV concerns me. (27)
I don't worry about the possibility of getting infected with HPV. (28)
The possibility of getting genital warts concerns me. (29)
The possibility of getting cervical (penile) cancer concerns me. (30)
The possibility of getting anal cancer concerns me. (31)
The possibility of getting oral and/or throat cancer concerns me. (32)
If I received one dose of HPV vaccine I am protected against HPV and HPV-associated diseases.(50)
If I received two doses of HPV vaccine I am protected against HPV and HPV-associated diseases.(51)
If I received three doses of HPV vaccine I am protected against HPV and HPV-associated diseases. (52)
Unprotected sex practices increase risk of getting HPV and other sexually transmitted diseases. (53)
Perceived severity:
HPV will increase my risk of genital warts. (33)
HPV will increase my risk of cervical (penile) cancer. (34)
HPV will increase my risk of anal cancer. (35)
HPV will increase my risk of oral and/or throat cancer. (36)
People die from being infected with HPV. (37)
People can get very sick from infection with HPV. (38)
People who are infected with HPV don't have to worry about their health. (39)
Genital warts would be a serious health problem for me. (40)
Cervical (penile) cancer would be a serious health problem for me. (41)
Anal cancer would be a serious health problem for me. (42)
Oral and throat cancer would be a serious health problem for me. (43)
If I were to have HPV infection I feel others would discriminate against me. (66).
If I were to have HPV infection some people would act as though I am less competent (capable) than usual. (67)
If I were to have HPV infection, I would be treated with less respect than usual by others. (68)
If I were to have HPV infection I feel others would be concerned they could catch HPV through contact like a handshake or eating food I prepare. (69)
If I were to have HPV infection I feel others would avoid me because of my HPV infection. (70)
If I were to have an HPV infection, some family members would reject me because of my HPV infection. (71)
If I were to have an HPV infection, some friends would reject me because of my HPV infection. (72)

If I were to have an HPV infection, others would feel awkward and tense when they are around me (73)
If I were to have an HPV infection, I would feel others think I am to blame for my HPV infection. (74)
If I were to have an HPV infection, I would not feel I could be open with others about my HPV infection. (75)
If I were to have an HPV infection, I would fear someone telling others about my HPV infection without my permission. (76)
If I were to have an HPV infection, I would feel that I need to keep my HPV infection a secret. (77)
If I were to have an HPV infection, I would feel I am at least partially to blame for my HPV infection. (78)
If I were to have an HPV infection, I would feel set apart from others who are well. (79)
If I were to have an HPV infection, I would have a greater need than usual for reassurance that others care about me. (80)
If I were to have an HPV infection, I would feel lonely more often than usual. (81)
If I were to have an HPV infection, because of the HPV infection, I would have a sense of being unequal in my relationships with others. (82)
If I were to have an HPV infection, I would feel less competent (capable) than I did before my HPV infection. (83)
Due to the HPV infection, I would sometimes feel useless. (84)
If I were to have an HPV infection, changes in my appearance would affect my social relationships. (85)
Perceived Barriers:
Shots are very painful. (2)
Needles don't bother me at all. (3).
I am not afraid of shots. (4)
HPV vaccine shots can lead to serious side effects. (5)
The HPV vaccine can make people very sick. (6)
One can get infected with HPV from the HPV vaccine shots.(7)
It will be hard for me to find time to get vaccinated for HPV. (10)
It will be hard for me to get transportation for 3 appointments to get vaccinated for HPV.(11)
It will be easy for me to get to a clinic for the 3 shots of HPV vaccine.(12)
The HPV vaccine is too expensive for me.(18)
Asking for the HPV vaccine would be embarrassing. (19)
Deciding whether I should get vaccine would be difficult without knowing more about HPV (20)
Deciding whether I should get the vaccine would be difficult without knowing more about the vaccine (21)
Perceived Benefits:
Getting vaccine shots against HPV would be a good way to protect my health. (8)
One way for me to stay healthy would be to get the vaccine shots to prevent infection with HPV. (9)
The HPV vaccine will protect me against cervical (penile) cancer. (13)
The HPV vaccine will protect me against anal cancer. (14)
The HPV vaccine will protect me against oral and throat cancer. (15)
The HPV vaccine will protect me against genital warts. (16)

Getting the HPV vaccine would protect my sexual partner(s) against HPV infection.(17)
Self-Efficacy:
I am confident that getting HPV vaccine could help to stay healthy (87)
I am confident that I could find the time to go to your health care provider for three visits to get vaccinated against HPV. (90)
I am confident that I could afford to get vaccinated against HPV (be able to pay for the three vaccine shots). (91)
Cues to action:
I will get HPV vaccine if my doctor suggests me to get it. (22)
I will get HPV vaccine if my parents suggest me to get it. (23)
Most people I know think that HPV vaccine are good for your health. (24)
I will get HPV vaccine if my partner (or a future partner if I don't have on now) suggests me to get it. (25)
I will get HPV vaccine if my friends suggest me to get it. (26)
If someone in my family had cervical (penile) cancer, I will get HPV vaccine. (44)
If someone in my family had anal cancer, I will get HPV vaccine (45)
If someone in my family had oral and/or throat cancer, I will get HPV vaccine (46)
If someone among my friends had cervical (penile) cancer, I will get HPV vaccine (47)
If someone among my friends had anal cancer, I will get HPV vaccine. (48)
If someone among my friends had oral and/or throat cancer, I will get HPV vaccine. (49)
Behavioral Intention
I am confident that I will get vaccinated against HPV next year. (88)
I am confident that I will get vaccinated completely against HPV (that is, get all three vaccine shots). (89)

Appendix E

Cover Letter for Consent

of the Participants in English

Cover letter for electronic survey

Participant,

This is an invitation to take part in a short survey assessing knowledge, perceptions, and behaviors of 18-26 years old Russian college students regarding human papilloma virus (HPV), HPV-related diseases, and HPV vaccination.

Participant, if you are already participated in the pilot version of this study, please, do not proceed taking survey for the second time.

This web-link serves as your informed consent for this study. Your participation in this study includes the completion of an on-line survey. All responses will be kept anonymous. Your name and identity will not be linked in any way to the research data. By clicking the link to take the survey, you show that you understand you are participating in the research study and give consent to the researcher to analyze the information you provide. In responding to this survey, you also affirm that you are at least 18 years of age. You have the right to refuse to complete the survey and can discontinue it at any time without penalty. The survey will take approximately 10-20 minutes to complete.

There will be an opt-out message that permits addressees to have their names removed from any future mailings. If you do not respond to this survey or return the opt-out message, you will be contacted again with this request four times during 12 weeks.

If you have any questions about this study, please contact the primary dissertation committee chair or doctoral student researcher:

Professor Joyce Fetro – jfetro@siu.edu

Maria Alexandrova
MD. OB-GYN
PhD candidate in Health Education
Department of Health Education and Recreation
Southern Illinois University Carbondale
work phone: (8101) 618 453 2777
mobile: +1 507 351 9672
malex@siu.edu

Thank you for your participation!

This project has been reviewed and approved by the SIUC Human Subject Committee. Question concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, Southern Illinois University, Carbondale, IL 62901-4709, USA. Phone (8101) 618 453 4533. E-mail siuhsc@siu.edu This research is approved by Scientific Research Provost of Yaroslav-the-Wise Novgorod State University - Eugeny.Bondarenko@novsu.ru; (816 2) 627222

Appendix F

Cover letter for Consent

of the Participants in Russian

Представление на участие в электронной анкете

Участник,

Это приглашение на участие в коротком опросе 18-26 летних русских студентов для исследования знаний, отношения и поведения, связанных с вакциной против вируса папилломы человека.

Участник, если вы уже принимали участие в пилотной версии данного исследования, пожалуйста, не заполняйте анкету повторно.

Эта интернет-ссылка представляет ваше информированное согласие на участие в данной исследовательской работе. Ваше участие в этом исследовании заключается в ответах на вопросы электронной анкеты. Все ваши ответы будут анонимными. Ваше имя и другие идентификационные данные никаким образом не будут связаны с результатами исследования. Переходя на интернет-ссылку, вы подтверждаете своё участие в данной исследовательской работе и даёте своё согласие на статистическую и аналитическую обработку представленной вами информации. Отвечая на вопросы анкеты, вы так же подтверждаете, что вам 18 лет или вы старше 18 лет. Вы имеете право отказаться участвовать в опросе или перестать отвечать на любом этапе анкеты без каких-либо для вас последствий. Заполнение анкеты займёт у вас примерно 10-20 минут.

Вам будет предоставлена возможность изъять ваш электронный адрес для последующих контактов с вами. Если вы решите не отвечать на вопросы анкеты и не выберете опцию изъятия вашего электронного адреса, то вы получите напоминание об участие в исследовании ещё 4 раза в течение последующих 12-ти недель.

Если у вас возникли какие-либо вопросы по поводу данного исследования, пожалуйста, свяжитесь с председателем диссертационной комиссии или студенткой докторантуры, проводящей данную научную работу:

Профессор Джойс Фетро (Joyce Fetro) – jfetro@siu.edu

Мария Александрова (Maria Alexandrova)
Врач акушер-гинеколог
Кандидат Докторантуры Здравоохранения
Кафедра Здравоохранения и Рекреации
Карбондельский Университет Южного Иллинойса
рабочий телефон: (8101) 618 453 2777
мобильный телефон: +1 507 351 9672
malex@siu.edu

Данная исследовательская работа одобрена для проведения Проректором по Научной Работе Новгородского Государственного Университета им. Ярослава Мудрого - Eugeny.Bondarenko@novsu.ru; (011 7816 2) 627222 и Комиссией по Защите Участников Исследований Карбондельского Унивеситета Южного Иллинойса, штат Иллинойс, США - siuhsc@siu.edu; (8101) 618 453 4533

Спасибо за ваше участие!

Appendix G

Human Subjects Committee of Southern Illinois University Carbondale

Approvals for Pilot and Main Studies

Southern
Illinois University
Carbondale

Research Development and Administration
Human Subjects Committee
www.siu.edu/orda/human
www.siuc.edu

To: Maria Alexandrova

From: Jane L. Swanson, Ph.D.
Chair, Human Subjects Committee

Jane L Swanson

Date: July 8, 2011

Subject: *Knowledge, Attitudes, and Behaviors of 18-26 years old Russian college students regarding Human Papilloma Virus (HPV)Vaccination: A Pilot Study*

Protocol Number: 11217

The revisions to the referenced study have been reviewed and approved by the SIUC Human Subjects Committee.

This approval expires on 5/17/2012, one (1) year from the review date. Regulations make no provision for any grace period extending beyond the above expiration date. Investigators must plan ahead if they anticipate the need to continue their research past this period. The application should be submitted 30 days prior to expiration with sufficient protocol summary and status report details, including number of accrued subjects and whether any withdrew due to complaint or injury. If you should continue your research without an approved extension, you would be in non-compliance of federal regulations. You would risk having your research halted and the loss of any data collected while HSC approval has lapsed. Extensions will not be required to continue work on an approved project when all the data has been collected, there will be no more interaction or intervention with human subjects and **subject identifiers have been removed** (e.g. during the data analysis or report writing stages).

Also note that any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Your Form A approval is enclosed. Best wishes for a successful study.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is 00005334.

JS:kr

Cc: Joyce Fetro

SIUC HSC FORM A

REQUEST FOR APPROVAL TO CONDUCT RESEARCH ACTIVITIES INVOLVING HUMAN SUBJECTS

CERTIFICATION STATEMENT

By making this application, I certify that I have read and understand the University's policies and procedures governing research activities involving human subjects. I agree to comply with the letter and spirit of those policies. I acknowledge my obligation to:

1. Accept responsibility for the research described, including work by students under my direction.
2. Obtain written approval from the Human Subjects Committee of any changes from the originally approved protocol **BEFORE** implementing those changes.
3. Retain signed consent forms in a secure location separate from the data for at least **three** years after the completion of the research.
4. Immediately report any adverse effects of the study on the subjects to the Chairperson of the Human Subjects Committee, SIUC, Carbondale, Illinois - 618-453-4533 and to the Director of the Office of Research Development and Administration, SIUC.
   Phone 618-453-4531. E-mail: **siuhsc@siu.edu**

Project Title
KNOWLEDGE, PERCEPTIONS, AND BEHAVIORS OF RUSSIAN COLLEGE STUDENTS REGARDING HPV, HPV-RELATED DISEASES, AND HPV VACCINATION

RESEARCH ADVISOR'S ASSURANCE: My signature on this application certifies that the student is knowledgeable about the regulations and policies governing research with human subjects. I am aware of my obligations stated on Form A and will be available to supervise the research. When on sabbatical leave or vacation, I will arrange for an alternate faculty sponsor to assume responsibility during my absence. I will advise the Human Subjects Committee by letter of such arrangements.

11/18/11

Researcher(s) or Project Director(s) Dr. Maria Alexandrova Date

Please print or type name below signature.

11/18/11

Researcher's Advisor (required for all student projects) Dr. Joyce Fetro Date

Please print or type name below signature.

The request submitted by the above-named researcher(s) was approved by the SIUC Human Subjects Committee.

This approval is valid for one year from the review date. Researchers must request an extension to continue the research after that date. This approval form must be included in all Master's theses/research papers and Doctoral dissertations involving human subjects that are submitted to the Graduate School.

12-5-11

Chairperson, Southern Illinois University Human Subjects Committee Date

SIU Southern Illinois University
CARBONDALE

OFFICE OF SPONSORED PROJECTS ADMINISTRATION
MAIL CODE 4709
900 SOUTH NORMAL AVENUE
CARBONDALE, ILLINOIS 62901

siuhsc@siu.edu
618/453-4533
618/453-8038 FAX

HSC Approval letter (exempt)

To: Maria Alexandrova

From: Jane L. Swanson, Ph.D
Chair, SIUC Human Subjects Committee

Date: December 6, 2011

RE: Protocol 11462

Title: *Knowledge, Perceptions, and Behaviors of Russian College Students Regarding HPV, HPV-Related Diseases, and HPV Vaccination*

The revisions to the above referenced study have been approved by the SIUC Human Subjects Committee. The study is determined to be exempt according to 45 CFR 46.101(b)2. This approval does not have an expiration date; however, any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Your Form A approval is enclosed.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is FWA00005334.

JS:kr

Cc: Joyce Fetro

SIU Southern Illinois University
CARBONDALE

OFFICE OF SPONSORED PROJECTS ADMINISTRATION
MAIL CODE 4709
900 SOUTH NORMAL AVENUE
CARBONDALE, ILLINOIS 62901

siuhsc@siu.edu
618/453-4533
618/453-8038 FAX

To: Maria Alexandrova

From: Jane L. Swanson, Ph.D.
Chair, Human Subjects Committee

Jane L Swanson

Date: February 13, 2012

Subject: *Knowledge, Perceptions, and Behaviors of Russian College Students Regarding HPV, HPV-Related Diseases, and HPV Vaccination*

Protocol Number: 11462

The SIUC Human Subjects Committee has approved the modifications to the above referenced project submitted on 2/2/2012 and you may proceed.

NOTE: Your study is determined to be exempt according to 45 CFR 46.101(b)2. Due to a change in policy your project no longer has an expiration date; however, any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Thank you for helping us keep your file up-to-date.

JS:kr

Cc: Joyce Fetro

Appendix H

Scientific Research Provost of Yaroslav-the-Wise Novgorod State University

Approvals for Pilot and Main Studies (English and Russian versions)

МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение высшего профессионального образования «Новгородский государственный университет имени Ярослава Мудрого» (НовГУ)

Б.Санкт-Петербургская ул., д. 41,
Великий Новгород, 173003
Тел. (816-2) 62-72-44, факс (816-2) 62-41-10
E-mail: NovSU@novsu.ru
http://www.novsu.ru
ОКПО 02068918, ОГРН 1025300780075,
ИНН/КПП 5321033744/532101001

_____ № _____

To: doctoral student o
Southern Illinois University Carbondal
Alexandrova Maria Vladimirovn

Permission to conduct research.

Yaroslav-the-Wise Novgorod State University grants you permission upon your request to conduct pilot and main studies "Knowledge, Perceptions, and Behaviors of 18-26 years old Russian students regarding HPV, HPV-related diseases, and HPV vaccination." The research will be conducted in the form of electronic questionnaire among students of Yaroslav-the-Wise Novgorod State University.

Scientific research provost, professor **Bondarenko E.A.**

МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение высшего профессионального образования «Новгородский государственный университет имени Ярослава Мудрого» (НовГУ)

Б.Санкт-Петербургская ул., д. 41,
Великий Новгород, 173003
Тел. (816-2) 62-72-44, факс (816-2) 62-41-10
E-mail: NovSU@novsu.ru
http://www.novsu.ru
ОКПО 02068918, ОГРН 1025300780075,
ИНН/КПП 5321033744/532101001

_____ № _____

Студентке докторантуры Карбондельского Университета Южного Иллинойса Александровой Марие Владимировне

Разрешение на проведение исследования.

Новгородский Государственный Университет удовлетворяет ваш запрос на проведение пилотного и основного исследований "Знания, отношения и поведение, связанные с вирусом папилломы человека (ВПЧ), заболеваниями, вызываемыми ВПЧ, и вакциной против ВПЧ среди российских студентов 18-26 лет". Исследование будет проводиться в форме электронной анкеты среди студентов Новгородского Государственного Университета им. Ярослава Мудрого.

Проректор по научной работе, профессор Бондаренко Е.А.

VITA

VITA **Maria V. Alexandrova** Summer 2012

2400 Northwestern Avenue, Apt. #20
West Lafayette, IN 47906

telephone: (mobile) 507 351 9672
e-mail: malexandrovamd@gmail.com

EDUCATION

Ph.D. Candidate, Department of Health Education and Recreation, Southern Illinois University, Carbondale, IL. Major field: Health Education. Research interests: maternal, prenatal, and reproductive health, sexuality education, violence prevention, program planning and community development, health promotion, international health, health disparities, use of technologies in health, health theories and models of change, and environmental health. Dissertation (in progress): *Knowledge, Perceptions, and Behaviors of Russian college students regarding Human Papilloma Virus (HPV) Vaccination.* Chair: Professor, Joyce Fetro. Expected completion: July 2012

Master of Science, Health Science Department, Minnesota State University, Mankato, MN. Major field: Community Health. Thesis: *Human papilloma virus (HPV) vaccination awareness, accessibility, and application among selected college students*, May 2008.

Obstetrician-Gynecologist (specialization residency certification)**,** Department of Reproductive Health, Saint Petersburg Medical Academy of Postgraduate Education, Saint Petersburg, Russia, July 2004

Medical Doctor, Institute of Medical Education, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia, June 2002

TEACHING EXPERIENCE

Southern Illinois University Carbondale, IL

Certified Instructor for the Emergency Care & Safety Institute in Advanced Level First Aid, CPR, and AED, Standard Level First Aid, CPR, and AED, CPR and AED (teaching assistantship) August 2010 – May 2011

- Teaching undergraduate students in First Aid/CPR certification course (45 students per semester)
- Full responsibility for the course
- Lecturing undergraduate students on current First Aid/CPR guidelines according to American Academy of Orthopedic Surgeons
- Conducting hands-on skills practices
- Creating syllabus, quizzes, & exams
- Supervising and grading quizzes, certification exams and skills tests (90 students were certified)

Instructor in Health Education (teaching assistantship) August 2008 – August 2010

- Teaching undergraduate students in the course Foundation of Human Health (75 students per semester)
- Full responsibility for the course
- Lecturing undergraduate students on current health issues
- Conducting interactive activities about current health issues with practical application to daily life
- Using e-book device, blackboard, internet, e-mails to deliver materials, give assignments, and receive homework & feedback from students
- Creating syllabus, quizzes, group activities, & exams
- Supervising and grading quizzes, seminars, & exams

Minnesota State University Mankato, MN

Instructor in Human Anatomy August 2007 – January 2008

- Teaching undergraduate students at human anatomy labs (25 students)
- Lecturing undergraduate students on female reproductive system (200 students)
- Supervising and grading quizzes, practicals and exams

MEDICAL and PUBLIC HEALTH EXPERIENCE

Meaningful World, Association of Trauma Outreach and Prevention New York, NY
Intern May – August 2007

- Representative in United Nations, Department of Information for NGO Meaningful World: Association for Trauma Outreach and Prevention
- Assisting with obtaining information/literature regarding any current and ongoing projects concerning community health and women's health issues
- Finding Fundraising Organizations and submitting applications for funds
- Research and literature review about post disaster mental health management
- Preparing and conducting workshops and attending executive team meetings

Central City Clinical Hospital Veliky Novgorod, Russia
Medical Doctor, Obstetrician- Gynecologist August 2004 - August 2006
July 2009 - August 2009

- Provided Emergency Care to more than 1 million patients
  - Differential diagnosis, approval of hospitalization, minor & major surgeries (500,000), treatment plans
- Supervised hospitalized patients
  - Final diagnosis, minor & major surgeries, treatment plans, approval for discharge
- Close collaboration with chief physician of the hospital and with hospital staff on the daily basis

Avicenna, Private Medical Center Veliky Novgorod, Russia
Medical Doctor, Obstetrician-Gynecologist March 2005- July 2006

- Provided Ambulatory Care to more than 200 patients
  - Differential diagnosis,
  - Annual gynecological examinations and treatment plans

HONORS and AWARDS

Dissertation Research Assistant Award for years 2011-2012, The College of Education and Human Services and Graduate School, Southern Illinois University Carbondale

Elmer J. Grace C. Clark Doctoral Scholar Award for Achieving High Academic Excellence and otherwise Distinguished Student in Major Field of Study for years 2011-2012, The College of Education and Human Services and Graduate School, Southern Illinois University Carbondale

Instructor Appreciation Honor 2011, The Athletic Department, Southern Illinois University Carbondale

Scholarship Conference Award Mankato Clinic Allied Health and Nursing, 2008, Minnesota State University, Mankato

Honorary Award for Outstanding Achievements and Highly Qualified Work in Emergency Care, 2006, Central City Clinical Hospital, Veliky Novgorod, Russia

Edmund Muskie Graduate Fellowship for years 2006-2008 under auspice of United States Department of State and International Research and Exchange Board, Moscow, Russia

Postgraduate Specialization in Obstetrics and Gynecology Scholarship for years 2002-2004, Novgorod Alliance – a US 501 © (3) Humanitarian Organization, Veliky Novgorod, Russia

President of Russian Federation Scholarship for Excellent Academic and Scientific Achievements for years 2001-2002, Institute of Medical Education, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia

Gotland Rotary Clubs Award for Clinical Training in Obstetrics and Gynecology, 2000, Visby County Hospital, Visby, Sweden

Competition Winner of Exchange Student Program for years 1995-1996, Wheatland-Chili Central High School, Scottsville, NY

PUBLICATIONS

Alexandrova M. (under review). Behavioral health services: Evaluation. Children who are abused and neglected. Education content areas: Community health. Education content areas: Environmental health. Education content areas: Human growth and development. Education content areas: Personal health. Education content Areas: Prevention and control of diseases in Wiley, D. & Cory, A. *Encyclopedia of School Health.* SAGE Publications, Inc., Thousand Oaks, CA

Ritzel, D., Gautam, Y., **Alexandrova, M.** (2012). Human and environmental health action plan: Smart strategies for a sustainable future. *Umwelt und Gesundheit Online (Environment and Health Online, 5, 6-12*

Alexandrova, M., Middleton, W., & Shaffer, S. (2011). Evaluation of campus health services: Assessing the international students' integration into the SIUC health services. *Eta Sigma Gamma Student Monograph, 28*(3), 19-23

Ritzel, D., Ratnapradipa, D., **Alexandrova, M.** (2011). The real and potential health, safety, and environmental issues from the 2010 BP gulf of Mexico oil spill. *Umwelt und Gesundheit Online (Environment and Health Online), 4,* 52-60

Alexandrova M. (2010). Facebook/social networking in Kittleson, M. *Teaching with Web 2.0.* Benjamin Cummings - Pearson Education, San Francisco, CA

Alexandrova M. & Dhaliwal S. (2010). World War III: Will it be the struggle for clean and safe drinking water? *Umwelt und Gesundheit Online (Environment and Health Online), 3,* 41-45

Alexandrova M. (2008). Study looks at HPV vaccine awareness and use. *American Public Health Association.* Fall 2008 Newsletter

Alexandrova M. (2008). Human papilloma virus (HPV) vaccination awareness, accessibility, and application among selected college students. *Thesis.* Minnesota State University, Mankato, Mankato, MN, 85

Alexandrova, M., Harchenko, E., Gromova, A., & Baydo S., (2001). Results of laparoscopic operations in the cases of the ectopic pregnancies. *Actual Problems of Modern Medicine: Materials of 8th Final Scientific Conference*, Institute of Medical Education, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia

Alexandrova, M. & Hrutsky, K. (2001). Brief comparative analysis of two systemic physiological approaches in modern medicine: "cybernetic" – Valter Kofler and "functional" – Peter Anohin. *Actual Problems of Modern Medicine: Materials of 8th Final Scientific Conference*, Institute of Medical Education, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia

Gromova, A., **Alexandrova, M.,** & Apelbaum, L. (2001). Ultrasound accuracy in diagnosis of abnormalities in fetal development. *Materials of 3rd United States – Russian Nursing Conference "Building Relationship for Collaboration between American and Russian Nurses.* I.P. Sechenov Moscow Medical Academy, Moscow, Russia; Regional Nursing Association, Saint Petersburg, Russia; Portland Pediatric Medical Center, Portland, Oregon, USA

RECENT CONFERENCE PRESENTATIONS

2012 Poster Presentation "Pilot Study: Knowledge, Perceptions, and Behaviors regarding HPV vaccination - Russian perspective" 2012 Eastern and Midcontinent Joint Regional Society of the Scientific Study of Sexuality, Indiana University, Bloomington, IN

2012 Presider "Community health promotion Strategies: Building Support for Local Programs", American Alliance for Health Physical Education, Recreation, and Dance 2012, National Conference and Expo, Boston, MA

2012 On-line Guest Professional for Worksite Health Promotion 4/588 on-line course & for Health Care Delivery U.S. 4/565 on-line course, Health Science Department, Minnesota State University, Mankato, MN

2011 Presentation "Human and environmental health action plan: Smart strategies for a sustainable future" 5th Annual Winter Meeting of the International Consortium for Interdisciplinary Education about Health and the Environment, University of Cologne, Cologne, Germany

RECENT CONFERENCE PRESENTATIONS

2010 Presentation “The real and potential health and environmental issues from the BP oil spill in the Gulf of Mexico" 4th Annual Winter Meeting of the International Consortium for Interdisciplinary Education about Health and the Environment, Cologne, Germany

2010 Presentation “World war III: will it be the struggle for clean and safe drinking water?” 12th Health Education and Injury Prevention Partnership and Field Conference, University of Cologne, Germany

2010 Presentation “Simple way to patient education: Case study on human papilloma virus (HPV) vaccination”, American Alliance for Health Physical Education, Recreation, and Dance 2010, National Conference and Expo, Indianapolis, IN

2009 Real-time Video Conferencing “International awareness about human papilloma virus (HPV) and HPV vaccination” from Southern Illinois University Carbondale to Medical Doctors, Obstetrician-Gynecologists, Yaroslav-the-Wise Novgorod State University

2008 Poster Presentation “Human papilloma virus (HPV) vaccination awareness, accessibility, and application among selected college students”, 2008 Society of the Scientific Study of Sexuality Annual Conference, Puerto Rico

MEMBERSHIPS

2008-present - member of Alpha Alpha Chapter of Eta Sigma Gamma Health Education Honor Society, Southern Illinois University Carbondale
2004 - present member of Obstetrical-Gynecological Society of Veliky Novgorod, Russia
2010-2011 – member of American Association of Health Educators
2009-2010 – member of Southern Illinois AIDS Alliance
2007-2009 – member of American Public Health Association
2007-2008 – member of Global Health Council
2006-2008 – first president and member of the Global Health and Peace Club, Minnesota State University Mankato
2006-2006 – member of Diversity Committee for Health Science Department, Minnesota State University Mankato
1996-2002 – member of Scientific Student Society, Institute of Medical Education, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia

COMMUNITY SERVICE

1995-present – interpretation/translation volunteer for international meetings and conferences
2008-present – various volunteer activities organized by International Student Services, Southern Illinois University Carbondale
2008-present – various volunteer activities organized by Alpha Alpha Chapter of Eta Sigma Gamma Health Education Honor Society, including chairing fundraiser committee in 2009-2010
2009-2010 – volunteer AIDS Alliance: committee meetings, AIDS Walk, and mass media interviews
2006-2007 – volunteer Health Peers Reaching Out, Health Education Office, Minnesota State University Mankato

SKILLS

Language: Fluent in both English and Russian with significant medical translation experience; Basic Spanish
Computer: Proficient in MS PowerPoint, Word, Publisher, Excel, Windows, SPSS, Skype, Blackboard
Internet: Extensive knowledge of Internet research tools, trends and developments