

**Awareness regarding Human Papilloma Virus (HPV) infection
and its prevention- A cross sectional study among medical
students in Trivandrum**

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**Dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
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DECLARATION

I hereby declare that this dissertation titled – “Awareness regarding Human Papilloma Virus (HPV) infection and its prevention - A cross sectional study among medical students in Trivandrum” is a Bonafede record of my original research. It has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published and unpublished work of others has been duly acknowledged in the text.

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CERTIFICATE

Certified that the dissertation titled - “Awareness regarding Human Papilloma Virus (HPV) infection and its prevention - A cross sectional study among medical students in Trivandrum” is a record of the research work undertaken by Dr Adya Reghu, in partial fulfilment of the requirements for the award of the degree of Master of Public Health under my guidance and supervision.

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GLOSSARY OF ABBREVIATIONS

CIN	Cervical Intraepithelial Neoplasia
DNA	Deoxyribonucleic acid
FDA	Food and Drug Administration
HPV	Human Papilloma Virus
IARC	International Agency for Research on Cancer
OPC	Oropharyngeal cancers
PCR	Polymerase Chain Reaction
RRP	Recurrent respiratory papillomatosis
STI	Sexually transmitted infections
STD	Sexually transmitted disease
VLP	Virus-like particles
WHO	World Health Organisation

Abstract

Introduction: The human papillomavirus (HPV), is a prevalent sexually transmitted infection (STI) that affects both men and women, with an estimated 80 percent of sexually active persons acquiring it at least once during their lives. The present study assessed the extent of awareness regarding HPV infection, and its prevention among medical students in Trivandrum.

Methods: A cross-sectional study was conducted among 553 medical students from three medical colleges in the Trivandrum district. Participants completed a questionnaire covering questions related to awareness on HPV infection, testing, vaccination, and attitudes towards vaccination. The responses were coded as correct or incorrect, and descriptive analysis was done in SPSS version 25. A criterion was set based on the median score that individuals scoring eight marks or higher in the HPV infection related questions was considered as having a good understanding of HPV infection, four marks or more in the HPV testing and vaccination related questions were classified as having a satisfactory understanding of HPV testing and HPV vaccination, respectively.

Results: Majority of participants was recruited from 1st and 2nd year of MBBS. The percentages of participants with a good understanding regarding HPV infection, testing and vaccination were 40.4 percent, 37.5 percent and 40.1 percent respectively. About 88 percent of participants responded that they will recommend the vaccine in future. In general, positive attitudes towards vaccination were noted, but concerns about affordability, safety, and misconceptions were identified as potential concerns to recommend vaccination in future

Conclusion: The study underscores the need for targeted education and awareness campaigns to improve understanding of HPV infection, testing, and vaccination among medical students to promote public health initiatives on HPV vaccination in the future.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

1.1 Background

Human Papilloma Virus (HPV), is the name of a complex group of 200 known viruses that cause significant health problems like genital warts, cervical cancer, other genital cancers, respiratory papillomatosis, plantar warts, and skin warts. Papillomaviruses have evolved alongside their hosts and are species-specific. Their origin is older than previously assumed because they have been discovered in fish, mammals, birds, and reptiles. It can infect the surface cells of the skin, as well as moist surfaces and inner linings of various organs and body cavities. These include the vulva, vagina, cervix, penis, anus, mouth, and throat. Infections caused by HPV can lead to abnormal tissue growth, such as skin warts or genital warts, as well as other cellular changes that may result in cancer. (HPV and Cancer - NCI, 2019)

The human papillomavirus, or HPV, is one of the most frequent sexually transmitted diseases (STIs) in the world and a serious global health concern. HPV is extremely common in both men and women, with an estimated 80 percent of sexually active persons acquiring it at some point in their life. For women, the estimated average lifetime risk of contracting HPV is 84.6 percent (ranging from 53.6% to 95.0%) and for men, it is 91.3percent (ranging from 69.5% to 97.7%) among those who have experienced at least one opposite-sex encounter. (Chesson et al., 2014). Because of the high transmission rates of this virus, which is spread by skin-to-skin contact during sexual activity, it is crucial to have a thorough awareness of the virus and implement effective preventive methods.

Based on their carcinogenic characteristics, HPV types are classified as "non-oncogenic" (caused by warts) or "oncogenic" (caused by cancer). HPV is one of the seven viral species that the International Agency for Research on Cancer (IARC) has classified as type one

carcinogens. According to their report, 13 HPV strains are associated with cervical cancer. Additionally, at least one of these kinds can result in vaginal, vulvar, penile, anal, and some head and neck cancers, with the oropharynx (the tonsils, base of the tongue, and back of the throat) being the most commonly affected. It is important to note that the HPV types responsible for genital warts are distinct from those causing cancer. (Humans, 2012)

According to estimates from the World Health Organisation (WHO), HPV caused about 70,000 new cancer cases in males and 620,000 new cancer cases in women worldwide in 2019. (WHO Fact sheet, 2024). Over 90 percent of women's HPV-related malignancies are cervical cancers. (CDC, 2023).

In 2022, cervical cancer accounted for over 660,000 new cases and 350,000 deaths worldwide, making it the second most prevalent cancer among women aged 15 to 44 and the fourth most common cause of cancer overall. (Cervical cancer, 2023). As HPV infection is responsible for nearly all cases of cervical cancer, making it a preventable disease through vaccination. The introduction of HPV vaccines, has revolutionized the approach to cervical cancer prevention. These vaccines are highly effective in preventing infection with the most common cancer-causing HPV strains, offering a promising avenue for reducing the global burden of cervical cancer.

Although HPV vaccines have been shown to be safe and effective, immunization rates are still below average in many regions of the world. This problem is exacerbated by a number of causes, including poor vaccine access, vaccine reluctance, and a lack of understanding about HPV and the diseases it is linked to. Providers noted a number of barriers to HPV vaccination, including some perceived parental misconceptions that could be addressed with education about the need for adolescent vaccines and available free vaccine programs. (Javanbakht et al., 2012)

1.2 LITERATURE REVIEW

1.2.1 Human papillomavirus (HPV)

The human papillomavirus (HPV) is regarded to be the most prevalent sexually transmitted viral infection and is among the leading causes of sexually transmitted diseases in the world for both men and women. (Burd, 2003)

About 75 to 80 percent of men and women of all ages are infected with genital HPV, making it the most widespread sexually transmitted infection in the world. The HPV virus can persist in the skin and cause genital warts. The chance of developing cervical cancer is increased by genital warts, which are little bumps or growths that form on the genitalia. (cancer.org, 2020)

Around 5 percent of all malignancies globally are now known to be caused by HPV. (de Martel et al., 2012) The HPV virus was initially introduced on February 12, 1985, by Dr Harald Hausen of the University of Heidelberg in Germany. Strong evidence was found, according to the paper, "linking viruses in the papilloma family with genital cancers, particularly cancers of the cervix and vulva." (Yousefi et al., 2022)

The family of papillomaviruses comprises viruses that infect both humans and animals, with one of the members being the human papillomavirus. It is composed of a significant number of small, nonenveloped double-stranded DNA viruses that infect both mucosal and cutaneous epithelial cells in humans. Both men and women can contract types of HPV, which can cause damage to the linings of the vagina, cervix, and rectum, also the skin of penis, vulva (the area outside the vagina), and anus. These kinds can also harm the mouth and throat's mucous membranes. (Basic Information about HPV and Cancer | CDC, 2022)

A meta-analysis of one million women with normal cervical cell tests found that around

291 million women worldwide have cervical HPV infections at any given time, with an average prevalence of 10.4 percent, which is higher in women under 25 at 16.9 percent. Types 16 and 18 of HPV cause about 70 percent of all cervical cancer cases, with type 16 detected in about 24 percent and type 18 in about 9 percent of women with HPV infections. (Crosbie et al., 2013)

511.4 million women in India who are 15 years of age or older are at risk of getting cervical cancer. According to predictions from *Globo can 2022*, 127526 women receive a cervical cancer diagnosis each year, and 79906 of them pass away from the illness. In India, cervical cancer is the second most common disease among women and the second most common cancer among women aged 15 to 44. It is estimated that five percent of women in the general population are infected with HPV-16/18 at any given moment, and HPVs 16 or 18 are responsible for 83.2 percent of invasive cervical cancer cases. (Sung et al., 2021)

1.2.2 HPV types

On the basis of genomic differences revealed by DNA sequence data, more than 200 different varieties of HPV have been identified. There are 85 HPV genotypes that have been thoroughly studied. Potential new genotypes are partially characterized in 120 more isolates. (Burd, 2003)

The numerous HPV strains can be divided into two groups such as Cutaneous HPV and Mucosal HPV.

Cutaneous HPV is a skin condition. Common warts are brought on by cutaneous HPV, not genital warts.

Cells that reside on moist surfaces, such as those in the vagina, cervix, vulva, anus, the inner foreskin, and the urethra of the penis, are affected by mucosal HPV. These varieties can also infiltrate the lining of the nose, mouth, throat, windpipe (trachea), and bronchial tubes

that lead to the lungs. Including vaginal, anal, and oral intercourse, direct sexual contact can transmit more than 40 different kinds of mucosal HPV. (Christensen, 2016)

According to their propensity to cause cancer, mucosal HPV is further split into two major types:

Low-risk HPV strains can result in skin warts on or around the genitalia and anus but do not cause malignancy. 90 percent of genital warts are caused by the HPV strains 6 and 11. High-risk HPV with a high risk of cancer. There are about numerous cancers can be brought on by high-risk HPVs. About 14 HPV varieties, including HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68, are considered high-risk types, which cause the majority of malignancies linked to HPV. (Yale Medicine, 2023)

In addition to various cutaneous HPV types, such as HPV2 which causes common skin warts, the alpha genus has about 30 HPV types that infect the mucosa of the genital canal. High-risk HPVs, which are the etiological agents of cervical cancer and a subset of other human malignancies, and low-risk HPVs, such as types 6 and 11, which are primarily connected to benign genital warts, are two classes of mucosal HPV types. (Dunne and Park,2013)

High-risk HPV infections occurring early in life can persist and, in conjunction with factors that promote cell transformation, may gradually progress to more severe diseases. The Pap smear remains the primary method for detecting high-risk HPV infections. (Burd, 2003)

Most low-risk HPVs don't result in illness. Some low-risk HPV varieties, however, can result in warts on or around the genitalia, anus, mouth, or neck. The majority of HPV-related malignancies are caused by two of these, HPV16 and HPV18. (HPV and Cancer - NCI,2019)

The most frequently studied papillomavirus types and their biological and clinical properties are described in the table given below. (Bernard, 2005)

Table.1.1 Types of Papilloma viruses

Genus	Species	Type(s)	Properties
Alpha-papillomaviruses	4	HPV-2, HPV-27, HPV-57	Common skin warts, often seen in genital warts of children
	5	HPV-26, HPV-51, HPV-69, HPV-82	High-risk malignant and benign mucosal lesions
	6	HPV-53, HPV-30, HPV-56, HPV-66	High-risk malignant and benign mucosal lesions
	7	HPV-18, HPV-39, HPV-45, HPV-59, HPV-68, HPV-70	High-risk malignant mucosal lesions, some types more common in adeno- than squamous carcinoma of cervix
	8	HPV-7, HPV-40, HPV-43	Low-risk mucosal and cutaneous lesions, known as butcher's wart virus in HIV infected patients
	9	HPV-16, HPV-31, HPV-33, HPV-35, HPV-52, HPV-58, HPV-67	High-risk malignant mucosal lesions, HPV-16 most prevalent in cervical malignancies
	10	HPV-6, HPV-11, HPV-13, HPV-44, HPV-74	Benign mucosal lesions, HPV-6 and HPV-11 commonly seen in genital warts and laryngeal papilloma's
Beta-papillomaviruses	1	HPV-5, HPV-8	Cutaneous benign and malignant lesions in EV and immune-suppressed patients
Gamma-papillomaviruses	1	HPV-4, HPV-65	Cutaneous benign lesions
Delta-papillomaviruses	4	Bovine papillomavirus-1 (BPV-1)	Fibropapillomas in cattle, sarcoids in horses, important cell culture model
Kappa-papillomaviruses	1	Cottontail rabbit papillomavirus (CRPV)	Cutaneous lesions, important animal model
Mu-papillomaviruses	1, 2	HPV-1, HPV-63	Cutaneous lesions, often seen in foot warts
Nu-papillomaviruses	1	HPV-41	Cutaneous lesions, unrelated to any other HPV type
Xi-papillomaviruses	1	BPV-3, BPV-4, BPV-4	Papilloma's of the alimentary canal, BPV-4 important model for multi-step carcinogenesis

1.2.3 Malignant Transformation

An HPV infection caused by oncogenic HPV types can remain for a long period and eventually transform healthy cells into cancerous cells if the body's immune system is unable to eradicate it. In ten percent of cases, a persistent HPV infection on the cervix results in a woman being at risk for developing cervical cancer. Similar to this, precancers can develop when high-risk HPV remains and infects the cells of the vulva, vagina, penis, or anus. If they are not discovered and removed in a timely manner, they can eventually turn into cancer. Compared to cervical cancer, these cancers are far less prevalent. (Basic Information about HPV and Cancer | CDC, 2022)

1.2.4 Transmission and natural history

Sexual activity, including both vaginal and anal contact, is the primary means that genital HPV infections spread. Skin-to-skin contact is necessary for transmission, although penetration of the vagina or anus is not a need.

Factors promoting transmission are primarily connected to sexual behavior, such as the partner's lifetime partner count, the number of sexual partners, and the age at which the partner first engaged in sexual activity. Factors like having a lower socio-economic status, smoking tobacco, certain sexual and reproductive behaviors, HIV or other STDs, using oral contraceptives for a long time, lacking certain nutrients, and genetic factors can all contribute to HPV infection. (Thulaseedharan et al., 2012)

HPV is extremely contagious and has an incubation period of three weeks to eight months or longer. Most people who get genital warts do so roughly two to three months following infection. Within three months, 10-30 percent of patients have spontaneous regression. This is connected to a suitable cell-mediated immunological reaction. Even though an infection may not cause noticeable symptoms, it can persist indefinitely even after the body has

seemingly cleared or controlled the infection. Infection with 'high-risk' HPV (HrHPV), such as types 16 and 18, follows the same pattern as 'low-risk' HPV (LrHPV), types 6 and 11, but clearance takes 12 to 18 months. However, persistent lesions are linked to the development of cervical intra epithelial neoplasia (CIN2/3) and invasive malignancies. Cell-mediated immunity, also known as CMI, and cervical intraepithelial neoplasia, or CIN.(Stanley, 2010).CIN1 is an insensitive histopathological sign of human papillomavirus infection, CIN2 includes a heterogeneous group of lesions that have different potential to progress to cancer, and CIN3 includes an insensitive histopathological sign of human papillomavirus infection.(Crosbie et al., 2013)

At any age, more than 90 percent of newly acquired human papillomavirus infections revert within 6 to 18 months. For an infection to proceed to cervical intraepithelial neoplasia (CIN), it must be persistent for months or longer. CIN3 represents the most clinically relevant lesions and is the best surrogate endpoint for cancer of cervix in screening and vaccination trials.

Studies examining cervix HPV infections and their relationship to cervical cancer have depended on indicators such as viral DNA in cellular scraping or biopsy tissue. The use of early DNA testing techniques revealed a link between HPV exposure and cervical cancer. Nonetheless, a more accurate evaluation of viral DNA presence in cervical specimens, including quantification by HPV type and variations, has been made possible by the development of Polymerase Chain Reaction (PCR) and other amplification techniques. Large-scale epidemiological studies are currently evaluating the use of serological testing for HPV antibodies following natural infections; however, their usage is limited because of under-detection resulting from unique immune responses that are only generated under specific circumstances. (Bosch and De Sanjosé, 2007)

1.2.5 HPV and associated diseases

A group of more than 200 viruses known as the human papillomavirus can infect the mouth, throat, and genitalia. While many HPV infections go away on their own and cause no symptoms, some can lead to various diseases, including:

1. Genital Warts (Condylomata Acuminata): Certain types of HPV can cause genital warts, which are growths or lumps that appear on or around the genitals and in the anal area. These warts can vary in size and appearance.

2. Cervical Cancer: Persistent infection with high-risk HPV types, such as HPV 16 and 18, is the primary cause of cervical cancer.

3. Other Cancers: In addition to cervical cancer, HPV can also cause other cancers, including:

- Anal Cancer: Especially in individuals who engage in receptive anal intercourse.
- Penile Cancer: Although rare, HPV can contribute to cancer of the penis.
- Vaginal Cancer: HPV can lead to cancer of the vagina.
- Vulvar Cancer: HPV infection can be a risk factor for vulvar cancer.
- Oropharyngeal (Throat) Cancer: High-risk HPV types, particularly HPV 16, are associated with a significant percentage of oropharyngeal cancers, which affect the throat, tonsils, and base of the tongue.

4. Rarer Cancers: HPV has also been linked to some rarer cancers, such as cancer of the larynx (voice box) and mouth cancer.

5. Respiratory Papillomatosis: In relatively rare cases, HPV can cause recurrent respiratory papillomatosis (RRP), a condition where warts grow in the airways, leading to breathing difficulties.

1.2.6 Screening and Testing for HPV

The goal of screening for HPV is to identify precancerous lesions, allowing for treatment to prevent progression to carcinoma. Options for screening include cytology-based testing (Pap smear), high risk HPV testing, and co testing (simultaneous cytology and high-risk HPV testing).

The 2015 supplement to the European guidelines endorsed HPV DNA testing as the primary screening method in organized programs, emphasizing its efficacy in detecting high-risk HPV types.

- It discouraged HPV testing outside organized programs and advised against Cotesting, instead advocating for either Pap testing or HPV testing as the primary method.
- The recommended age for routine HPV testing initiation was set at 35, with Pap testing suggested for ages 30-34 due to insufficient evidence for HPV DNA testing in this group.
- Women with negative HPV tests were advised a screening interval of at least 5 years, extendable up to 10 years based on age and medical history, with potential cessation of screening around ages 60-65 with recent negative results.
- Management of positive HPV tests included cervical cytology triage, with direct referral to colposcopy not recommended as a first step. (Liverani et al., 2020)

When it comes to screening for cervical cancer, HPV testing is an extremely sensitive and objective molecular method that doesn't rely on morphologic interpretation of data, which in cytology can be prone to inter-observer variability. To identify high-grade cervical dysplasia, HPV testing depends on the virus's detection or the infection's effects. Since HPV cells need more time to proceed to cancer than cells in the pre-cancer stage, one advantage of HPV testing is that it permits longer screening intervals. (WHO, 2023)

Human papillomavirus (HPV) has been a major global cause of oropharyngeal cancers (OPCs) over the last 25 years, with HPV type 16 (HPV-16) being the main cause. OPC incidence rates and the attributable fraction (AF) of HPV are rising as a result of HPV overtaking tobacco exposure as the primary cause of OPC in a number of high-human development index nations, including the US, Europe, and Latin America. OPC is currently more common than cervical cancer in the United States, which emphasizes the necessity for complementary preventive measures. Despite this, there have been arguments made against conducting additional study on HPV-driven OPC screening, pointing out the advantages of primary prevention through HPV vaccination, the low incidence rates that exist today, and the positive results of current treatments. (Kreimer et al., 2018)

The United States Preventive Services Task Force (USPSTF) guidelines from 2018 recommend that women aged 21-29 should have a Pap test every 3 years, while those aged 30-65 can choose between Pap testing every 3 years, high-risk HPV testing every five years, or co-testing every five years (grade A recommendations). They also advise against screening women under 21 or over 65, as well as those who have had a hysterectomy with prior adequate screening and are not at high risk for cancer. (US Preventive Services Task Force et al., 2018)

1.2.7 HPV Prevention

The risk of infection with HPV can be decreased by limiting the number of sexual partners, delaying first intercourse until a later age, and regularly using condoms. It is advised to give up alcohol and smoke in order to lower the chance of HPV persistence and the emergence of cancers linked to HPV.^{15,16} For both coital and noncoital sexual activity, the use of dental dams and male and female condoms may help stop the transmission of HPV. Vaccination, however, is the main preventive strategy that is advised. Vaccinations against

HPV are preventive; they do not cure existing illness or stop its progression. It has been shown that vaccination lowers the incidence of anogenital warts, precancerous cervical lesions, and vaccine-type HPV in females. (Quinlan, 2021)

The HPV vaccine is most effective when given before the initiation of sexual activity. The FDA has authorized immunization for both adults and children aged nine to forty-five. Regardless of the patient's gender, the Advisory Committee on Immunization Practices advises immunization at 11 or 12 years old. For those between the ages of 13 and 26 who are not fully immunized, a catch-up vaccination is advised.

1.2.8 HPV Vaccine

In the 1990s, researchers Doug Lowy, M.D., and John Schiller, Ph.D., studied cancer-causing genes in HPV, leading to vaccines that reduced HPV infections by 64 percent in the U.S. Their work, inspired by earlier findings on HPV and cervical cancer, was supported by the NCI. They used HPV protein L1 to create safe vaccines, licensed by Merck and GlaxoSmithKline, preventing various HPV-related cancers. Their achievements were recognized with awards like the Lasker-DeBakey Clinical Medical Research Award and the National Medal of Technology and Innovation, highlighting their significant contributions to public health. (Center for Cancer Research, 2023)

All HPV vaccines include VLPs targeting high-risk types 16 and 18, with the nonvalent vaccine also covering types 31, 33, 45, 52, and 58. They additionally guard against anogenital warts from types 6 and 11. These vaccines are approved for females aged nine and older, extending up to 26 or 45 years depending on the vaccine. Some are also approved for males. They prevent cervical precancerous lesions and cancers caused by high-risk HPV, with variations based on the vaccine type. WHO's recommendations ensure their quality, and 125 countries (64%) include HPV vaccines for girls in their national immunization

programs, with 47 countries (24%) including boys as well.(WHO position paper 2022.pdf)

Prophylactic HPV vaccinations have been widely used for the past 15 years, showing a great safety record in the community and exceptional efficacy against specific HPV infections and associated diseases like cervical cancer. Since 2009, the World Health Organization has supported the administration of these drugs to pre-adolescent girls as a preventive intervention against cervical cancer. Initially, a three-dose plan was used, but later, based on immunobridging findings, those under fifteen years of the age were switched to a two-dose schedule. To speed up the reduction of disease, countries should vaccinate girls between the ages of nine and 14 on a regular basis and provide a one-year catch-up program, according to WHO recommendations.(WHO position paper 2022.pdf)

According to a Cochrane analysis, vaccinations between the ages of 15 and 26 for females, with or without HPV exposure, reduce the risk of CIN2 and CIN3, with a number needed to treat of While immunization is not always advised for older adults because most adults have been exposed to HPV, patients between the ages of 27 and 45 who have never received a vaccination can benefit from shared decision-making when it comes to administration.

Vaccines currently on the market include virus like particles (VLPs) made up of the L1 structural protein. The quadrivalent vaccine known as Gardasil® targets HPV types 16, 18, 6, and 11, and it was approved in 2006. Similarly, the bivalent vaccine called Cervarix® focuses on HPV types 16 and 18 and was approved in 2007. More recently, the nonvalent vaccine named Gardasil9® has become available, targeting HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58. This new vaccine offers broader protection against a wider range of HPV types associated with cervical and other HPV-related cancers. (Ntanasis-Stathopoulos et al.,2020)

1.2.9 HPV Vaccination Status – Global and Indian Perspective

In 2020, WHO set targets for cervical cancer elimination by 2030: vaccinating 90 percent of girls, screening 70 percent of women, and treating 90 percent with cervical disease. Comprehensive action across all three pillars is essential for achieving elimination, as no single intervention is enough. Meeting and sustaining the 90:70:90 targets is estimated to prevent 74 million new cervical cancer cases and 62 million deaths across 78 low- and middle-income countries by 2120.(Cervical Cancer Elimination Initiative, 2023)

HPV vaccination programs have significantly reduced cervical cancer cases in many countries, but progress remains slow in parts of South Asia, including neighboring countries of India. Factors such as poor awareness of cervical cancer, low screening rates, limited vaccine availability and access, and hesitancy towards vaccination contribute to the region's high disease burden. Some South Asian nations like Bhutan, Thailand, Sri Lanka, and the Maldives have started national HPV vaccination programs for girls, with pilot projects in countries like Bangladesh. However, Pakistan does not include HPV vaccines in its national schedule despite a high cervical cancer mortality rate, partly due to recent floods. Nepal canceled its HPV vaccination program due to funding issues, despite cervical cancer being prevalent. Although 42 countries vaccinate boys against HPV, many resource-constrained nations focus solely on girls, although experts advocate for gender-neutral vaccination to combat cervical cancer, including in India.(The Lancet Oncology, 2022).Countries with government-supported subsidy programs or those that have included the HPV vaccine in their national immunization programs are expected to have higher vaccination rates, potentially explaining lower rates in regions lacking these initiatives.(Varer Akpinar and Alanya Tosun, 2023)

In India, efforts are underway to increase the number of teenage females receiving the human papillomavirus (HPV) vaccine. The nation granted licenses for bivalent and

quadrivalent HPV vaccinations in 2008, and in 2018 a nonvalent vaccine was approved. HPV vaccination was included to India's public health services through demonstration programs that were started in 2009 in Andhra Pradesh and Gujarat. The use of vaccination for HPV in research projects was discontinued after a few deaths in these studies that were later determined to be unrelated to vaccination. In a trial comparing two versus three doses, this suspension by default meant that some individuals only received one dose. Since 2016, the government-sponsored opportunistic immunization project in Delhi, the possibility of a single dosage, and the successful introduction of HPV vaccination in immunization schemes in Punjab and Sikkim (with excellent coverage and safety). (Sankaranarayanan et al., 2019)

The Indian Ministry of Health and Family Welfare wrote to seven state governments in January 2023, ranging from Tamil Nadu in the far south to Himachal Pradesh in the country's far north, asking them to begin preparing for the introduction of the human papillomavirus vaccine to girls between the ages of nine and 14. The campaigns will be the first of three stages in which the HPV vaccine will be introduced in India. After covering children ages 9 to 14 years, the notified states will incorporate the HPV vaccination into their regular immunization schedules. In 2024 and 2025, a second round of states and union territories will see similar initiatives. In the end, 68 million Indian girls were supposed to have received an HPV vaccination. An additional 11.2 million girls aged 9 years will be targeted each year for HPV vaccination. (Burki, 2023)

The Serum Institute of India launched the first domestically manufactured qHPV vaccine 'CERVAVAC' on January 24, 2023, in New Delhi. India has launched its first HPV vaccination made in the country, Cervavac Quadrivalent Human Papillomavirus (Serotypes 6, 11, 16 and 18) Vaccine, marking a significant advancement in the battle against HPV strains linked to cervical, vaginal, and vulvar cancers. After successful trials, it received approval from the Drugs Controller General of India on July 12, 2022, for individuals aged

9–26. Priced at 200–400 rupees (€5) per dose, Cervavac is notably more affordable than other HPV vaccines, offering hope for improved cervical cancer control not only in India but also in low- and middle-income countries.

According to the budget for 2024, the Indian government is thinking of incorporating the HPV vaccination into the country's immunization program for females between the ages of 9 and 14. The inclusion of the HPV vaccination in India's national immunization programme is a remarkable advancement in the fight against cervical cancer. This proactive measure aims to shield young girls from high-risk HPV strains, potentially curbing the disease's prevalence in the future. By ensuring widespread access to vaccination and addressing affordability concerns, this initiative not only protects individual health but also contributes to public health by reducing overall cervical cancer burdens. It aligns with global efforts towards achieving cervical cancer elimination goals through comprehensive preventive strategies.

1.3 Rationale of the Study

Human Papillomavirus (HPV) is one of the most prevalent sexually transmitted infections globally, with the potential to cause various cancers and other health issues. India, in particular, bears a significant burden of HPV-related diseases. Strategies to prevent HPV infection, such as vaccination, have been introduced in the country. However, the effectiveness of these interventions is contingent upon the awareness and perceptions of the target population. Medical students, as future healthcare providers, are pivotal in promoting these preventive measures. This study seeks to comprehensively evaluate the awareness and attitudes of medical students in Trivandrum regarding HPV infection and its prevention. By addressing knowledge gaps and understanding their perceptions, the research aims to contribute to the development of informed healthcare professionals who can actively participate in public health strategies aimed at preventing HPV infections in India.

1.4 Objectives

Major Objective

To assess the extent of awareness regarding Human Papilloma Virus Infections (HPVs) and its prevention among medical students

Minor Objective

To evaluate medical student's perceptions towards HPV vaccination

CHAPTER 2

METHODOLOGY

2.1 Study Design

Cross-Sectional, questionnaire survey

2.2 Study Setting

There are four medical colleges in Trivandrum which includes Govt Medical college Tvm, SUT Medical College Tvm, Sree Gokulam Medical College, and CSI Medical college, Karakoram. The MBBS students and house surgeons studying and doing internship at four medical colleges in Tvm were the study population. Approximate population size in all the four colleges were around 3500. However, permission was not granted from one institution. Hence the study setting was limited to three medical colleges.

2.3 Sample size

Sample size is calculated on the basis of a systematic review “A systematic review regarding the challenges of health promotion and education to prevent cervical carcinoma (Thulaseedharan JV,2017), with the following findings:

Table 2.1 HPV Awareness in Medical Students

Awareness among medical students	Percentage
HPV/aetiology	45 – 95 %
HPV Vaccination	30 – 75.6 %
Readiness to accept HPV vaccination	60 – 80 %

Assuming that 50% of medical students are aware of HPV, using the below described

$$\text{formulan} = \frac{Z^2P(1-P)}{d^2}$$

Where $Z=1.96$, $p=0.50$, $d= 0.05$

n = Sample size,
Z = Z statistic for a level of confidence
P = Expected Prevalence/ proportion
d = Precision (If the precision is 5%, then
d = 0.05

Sample size (n) = 384, but a population correction factor applied for a population size of 3500, and the sample size is reduced to 348.

Adjusted sample size(N) was approximately 500 participants to account for the expected 30% non-response or incomplete survey forms by using formula

$$348 = N - 30\%N \quad N = 497 \text{ rounded to } 500$$

N = 500

The sample was decided to be taken from 4 medical colleges (125 from each)

In the study 553 responses were received from three colleges.

2.4 Data collection procedure

The data collection procedure for this study initially aimed to include four medical colleges in Trivandrum, with a sampling frame of 3500 students. The plan was to randomly select 125 students from each college, distributed across different academic years and stages of education, totaling a sample size of 500 students. However, due to permission constraints, one college was excluded, reducing the sampling frame to 2250 students across three colleges.

Despite the original intention to select students randomly, challenges on the field led to a different approach. The colleges provided a class of their choosing, comprising a mix of students from various academic years, as third and final year students were either on study

leave or engaged in ongoing exams. Consequently, the study approached 300 students in the first college, 350 in the second, and 300 in the third.

The responses obtained were 130 from the first college, 220 from the second, and 203 from the third, resulting in a total of 553 responses. The higher response rate than anticipated was due to the inability to select students randomly, leading to a more comprehensive data collection than initially planned.

2.5 Data collection Instruments

Data collection was carried out through structured survey questionnaires. As this study was conducted among medical students, the English version of a structured questionnaire with various sections was used for data collection.

Section 1

Basic Information: Collected demographic data such as age, gender, and academic year.

Section 2

Awareness Statements on HPV Infection: Gathered information on participants' awareness of HPV and related facts.

Section 3

HPV Testing Knowledge Scale: Assessed participants' knowledge about HPV testing.

Section 4

Awareness Statements on HPV Vaccination: Explored participants' understanding of HPV vaccination.

Section 5

Attitudes and Perceptions Related to HPV Vaccination: Captured participants' attitudes toward HPV vaccination.

Open-Ended Question: Invited participants to provide their opinions on barriers to HPV vaccination.

The questionnaire also included clear instructions for respondents.

A section at the end of the questionnaire where participants can indicate if they were willing to be contacted for further discussions or follow-up related to the study, along with their preferred contact method.

Section 2, Section 4 & Section 5 are taken from a study done about “Assessment of understanding about Human papilloma virus vaccination among undergraduate medical students in a developing country: Perspective from India “(Sharma et al., 2020), for the consent already sent an email to the corresponding author.

Section 3 has been taken from a study done in “Development and validation of the cervical cancer knowledge scale and HPV testing knowledge scale in a sample of Canadian women”, for the consent contacted the author through email and got the consent to use the scale. (Haward et al., 2022)

2.6 Data entry and Analysis

Data was collected through structured questionnaires administered to the selected MBBS students, focusing on their knowledge and perceptions of HPV and HPV vaccination.

Collected data was meticulously checked for completeness and accuracy. It was then entered into data analysis software for further processing.

For evaluation of awareness, participants responded to statements using ‘Yes’, or ‘No’ or ‘Do not know’ and for the attitude, they responded as ‘agree’ or ‘disagree’ or ‘neutral’. To objectively quantify the knowledge, each question was given the score of one. HPV testing knowledge scale the scores ranges from zero to eight for correct answers.

Statistical analysis was conducted using software IBM Statistics SPSS version 25 windows. Descriptive statistics, Numeric variables was described using mean and standard deviation, Categorical variables was described using frequency and percentages, was used to

summarize the participants' knowledge and perceptions regarding HPV and HPV vaccination.

2.7 Ethical Considerations

The Sree Chitra Tirunal Institute for Medical Sciences and Technology's Institutional Ethics Committee approved the study before was carried out.

Prior to completing the questionnaire, participants were provided with a participant Information sheet, and were asked for their informed consent before proceeding.

The participant's identity was kept confidential using a special identification number for each questionnaire.

When no longer required or after submitting the dissertation report for one year, whichever comes first, all copies of the questionnaire will be declared destroyed. The participants also had the opportunity to ask any questions they had about the study.

CHAPTER 3

RESULTS

The study comprised 553 medical students from three medical colleges in the Trivandrum district. The observations are presented in different sections in this chapter.

3.1 Background details of the study participants

The distribution of participants across list of institutions and basic information of the participants are described in section 3.1

Table 3.1. List of participants per institution

Name of the institution	Frequency (n =553)
Institution 1	130
Institution 2	220
Institution 3	203

Out of 553, the recruited number of participants was less in the Institution1.

The mean age of the study participants was 20.7 with a standard deviation of 1.8 years. The distribution of respondents based on age groups, sex and academic year of study are presented in Table 3.2.

Nearly 50 percent of students participated in the study were in the age group of 20-21 years. There were more female participants in the study (65.2% Vs 31.1%), and three participants wished to remain unidentified. Of the participants, the majority were in their first or second year of study (85.9%), with 11.7 percent falling into the "Others"(fourth year and house surgency) category.

Table.3.2 Basic Information of study participants

Characteristics	Frequency (%)
AGE GROUP	
<=19	130(23.4)
20 - 21	277(49.9)
>=22	117(21.1)
Missing	29(5.2)
SEX	
Male	172(32.1)
Female	361(67.3)
Prefer not to say	3(0.6)
ACADEMIC YEAR	
1st year	234(42.3)
2nd year	241(43.6)
Others	65(11.7)
Missing	13(2.4)

3.2 Awareness about HPV infection among the medical students

The focus of the HPV infection awareness statements is to assess participants' knowledge about the human papillomavirus (HPV) infection. The key information included in these statements include the link between HPV and Ano-genital warts and cervical cancer, the possible occurrence of invisible infections, and the potential for HPV to cause penile malignancies. The questionnaire also evaluates participants' knowledge of HPV's curability, transient nature, and preventative strategies including screening and condom use. Statements regarding HPV testing, contraceptive pills, and the prevalence of HPV infections are included to enhance the search for public awareness regarding this common viral infection.

The table 3.3 presents awareness statements related to HPV infection, and the responses.

Participants responded using 'Yes', 'No', or 'Do not know' for knowledge assessment of HPV infection. Further the responses were coded as correct or incorrect, and the frequency and percentages of responses are listed in the table.

Table 3.3 Awareness statements about HPV infection and responses from the participants.

Awareness statements about HPV infection	Correct response Number (%)	Incorrect response Number (%)	Total
HPV is a sexually transmitted infection (True)	515(93.1)	35(6.3)	550
HPV can cause cervical cancer (True)	446(80.7)	106(19.2)	552
HPV can cause Ano genital warts (True)	342(61.8)	203(36.7)	545
HPV can cause penile cancers (True)	219(39.6)	324(58.6)	543
A person might be infected without knowing (True)	457(82.6)	88(15.9)	545
HPV can be cured by taking antibiotics (False)	388(70.2)	155(28)	543
HPV can heal by itself (True)	51(9.2)	498(90.1)	549
Pills protect against HPV (False)	345(62.4)	204(36.9)	549
Using a condom can provide partial protection against HPV (True)	453(81.9)	93(16.8)	546
There is a simple vaginal test to find out if you've got HPV (True)	246(44.5)	294(53.2)	540
It's important for women to be screened for HPV (True)	480(86.8)	68(12.3)	548
Most people with genital HPV infection have visible signs or symptoms (False)	190(34.4)	357(64.6)	547
HPV is very common. (True)	221(40)	330(59.7)	551

The results from the HPV awareness statements indicate varying levels of knowledge among participants, with some questions showing potential gaps in understanding. While majority correctly identified HPV as a sexually transmitted infection (93.1%), its association with cervical cancer (80.7%), and the possibility of asymptomatic infections (82.6%), there were areas of notable misconceptions among the participants. Particularly, a

major proportion of respondents (59.7%) are unaware that HPV is very common and 64.6 percent think that most people with genital HPV infection have visible signs or symptoms. Furthermore, 82.6 percent acknowledged that an individual may have HPV infection without realizing it. In terms of prevention and therapy, only 9.2 percent knew that HPV can heal itself, whereas 70.2 percent accurately said that antibiotics cannot cure HPV. On the other hand, 81.9 percent properly recognized that condoms provide some protection against HPV, whereas 62.4 percent mistakenly thought that tablets offer protection against the virus.

There was also variation in the information regarding HPV testing; 44.5 percent of participant's responded that a straightforward vaginal test was available for HPV screening. Most participants (86.6%) responded that screening women for HPV is important. Nearly one third (34.4%) of respondents, however, were mistakenly believed that the most of genital HPV infection cases show visible signs or symptoms.

In assessing the overall knowledge scores related to HPV infection, a scoring system was implemented where correct responses were awarded a score of one, while incorrect responses received zero marks. Upon totaling the scores, the maximum achievable score was thirteen. Subsequently, a criterion was set based on the median score that individuals scoring eight marks or higher could be considered as having a good understanding of HPV infection. Consequently, the data analysis revealed that only 40.4 percent of the participants achieved a total knowledge score that met or exceeded the threshold for good knowledge regarding HPV infection.

3.3 Assessment of HPV Testing Knowledge

The HPV Testing Knowledge Scale (HTKS) is designed to assess participants' knowledge regarding HPV testing, which plays a crucial role in cervical cancer screening and prevention. The scale includes statements covering various aspects of HPV testing, such as

HPV test capabilities, compatibility with Pap tests, implications for cervical cancer risk, the need for follow-up after a positive test, self-sampling options, relevance to HPV vaccination, and connection with abnormal Pap test results.

Table 3.4 Awareness on HPV testing using the HPV Testing Knowledge Scale (HTKS)

HPV Testing Knowledge Scale (HTKS)	Correct response Number (%)	Incorrect response Number (%)	Total
An HPV test can tell a woman how long she has had HPV (F)	166(29.9)	384(69.2)	550
An HPV test can be done at the same time as a Pap test (T)	195(35.1)	353(63.3)	548
If the HPV test shows that a woman has HPV, this means she is at increased risk for cervical cancer (T)	435(78.4)	113(20.4)	548
If the HPV test shows a woman has HPV, this means she already has cervical cancer (F)	309(55.7)	239(43.1)	548
If the HPV test shows a woman has HPV, this means she needs further follow-up (T)	473(85.2)	75(13.5)	548
The HPV test sample can be collected by the woman herself using a specialized HPV self-sampling kit (T)	145(26.1)	401(72.3)	546
Women who have received the HPV vaccine do not need the HPV test (F)	348(62.7)	201(36.2)	549
If HPV is found during HPV testing, this is the same thing as an abnormal Pap test result (F)	91(16.4)	454(81.8)	545

The results of the participant survey on their knowledge about HPV testing show a mixture of accurate information and false beliefs. Nearly half of the participant's correctly identified that an HPV test indicating HPV presence does not equate to already having cervical cancer (55.7 %), and recognized the need for further follow-up after an HPV-positive result (85.2 %).

A large proportion mistakenly believed that an HPV test could determine the duration of HPV infection (69.2 %) and that an abnormal Pap test result equated to finding HPV during testing (81.8 %). Furthermore, the survey exposed ignorance about self-sampling for HPV testing. Only a small minority were aware that women can self-collect HPV test samples using specialized kits (26.1%).

A scoring method was used to assess the overall knowledge of HPV testing, assigning a score of one for correct answers and zero for incorrect ones. The total score for all correct answers was then calculated, resulting in a maximum achievable score of eight. To determine a level for good knowledge, participants scoring four marks or more were classified as having a satisfactory understanding of HPV testing. As a result, the analysis indicated that only 37.3 percent of the participants achieved a total knowledge score that met or exceeded the predefined threshold for good knowledge regarding HPV testing.

3.4 Awareness regarding HPV Vaccination

The awareness statements on HPV vaccination aim to assess participants' knowledge and understanding of key aspects related to HPV vaccines. These statements cover various topics such as the preventive capabilities of the HPV vaccine against HPV infection, cervical cancer, and genital warts. They also explore participants' awareness regarding the approved age for vaccination, the required number of vaccine doses, considerations for HPV DNA-positive individuals, the availability of different types of HPV vaccines, and potential contraindications such as lactating or breastfeeding status. Participants responded using 'Yes', 'No', or 'Do not know' for knowledge assessment of HPV Vaccination, further evaluated as correct or incorrect responses to each question.

Table 3.5 Awareness regarding HPV vaccination- responses from the medical students

Awareness statements on HPV Vaccination	Correct response Number (%)	Incorrect response Number (%)	Total
HPV vaccine prevents HPV infection (True)	459(82.7)	89(16)	548
HPV vaccine prevents cervical cancer (True)	296(53.3)	251(45.2)	547
HPV vaccine prevents genital warts (True)	231(41.6)	314(56.6)	545
Approved age for vaccine is 9 - 26 years (True)	323(58.2)	224(40.4)	547
Required number of doses for vaccine is 3 universally (False)	40(7.2)	506(92.7)	546
If a person is HPV DNA positive, the vaccine is not recommended (False)	96(17.3)	448(80.7)	544
There are three types of HPV vaccines available (True)	148(26.7)	396(71.4)	544
Vaccine is contraindicated in lactating/breast feeding females (False)	47(8.5)	499(89.9)	546

The results of the survey on awareness statements about HPV vaccination shows that respondents had a combination of accurate knowledge and misconceptions. Most people agreed that the HPV vaccine protects against HPV infection (82.7 %) and that the recommended age range for immunisation is 9 to 26 years old (58.2 %). There were significant gaps in the participants' knowledge, too, as only almost half of them correctly identified the HPV vaccine's ability to prevent cervical cancer (53.3%), and even fewer recognised its function in preventing genital warts (41.6%). Furthermore, a large majority of respondents were misinformed that the vaccination is contraindicated in females who are nursing or lactating (89.9%) and that the recommended number of doses for the vaccine is uniformly three (92.7%).

A significant portion of participants (17.3 %) mistakenly thought that vaccination is not advised if a person has HPV DNA, whereas vaccination is still beneficial even after HPV

exposure. Concurrently, a sizable majority (71.4%) was not aware that there are three different kinds of HPV vaccines available.

The evaluation of awareness concerning HPV Vaccination utilized a scoring method where participants received one point for correct responses and zero for incorrect ones, resulting in a maximum score of eight. An assessment criterion was established, where a score of four marks or more indicated a commendable level of knowledge. The analysis revealed that only 40.1 percent of respondents achieved a total knowledge score meeting or exceeding the specified threshold for a robust understanding of HPV vaccination.

The level of knowledge on HPV infection, testing and vaccination were summarized in the following figure (Figure 3.1)

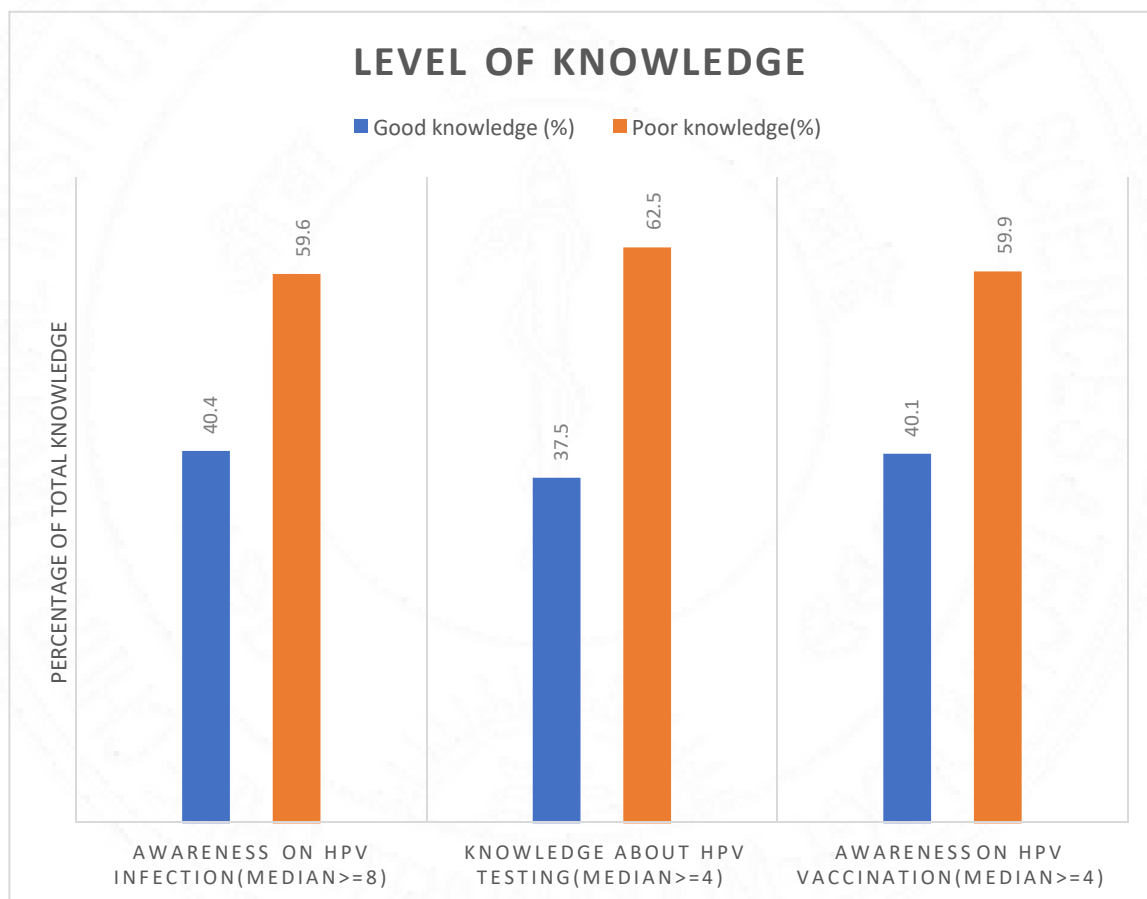


Figure 3.1 Awareness levels of HPV infection, testing and vaccination

The level of knowledge was further analyzed with respect to the sex and academic year of participants. The Figure 3.2 presents male-female differences in awareness and knowledge

levels regarding HPV infection, testing, and vaccination among males and female medical students. Female students showed higher levels of awareness, specifically, 44 percent of female students had better knowledge of HPV infection, compared to 33.7 percent of male students. Similarly, in awareness about HPV vaccination, female students exhibited a higher level of understanding at 42.9 percent compared to 34.9 percent among male students. However, when it comes to knowledge about HPV testing, male students had a slightly higher percentage of better awareness compared to female students (38.4% vs 36.3%) (Figure 3.2).

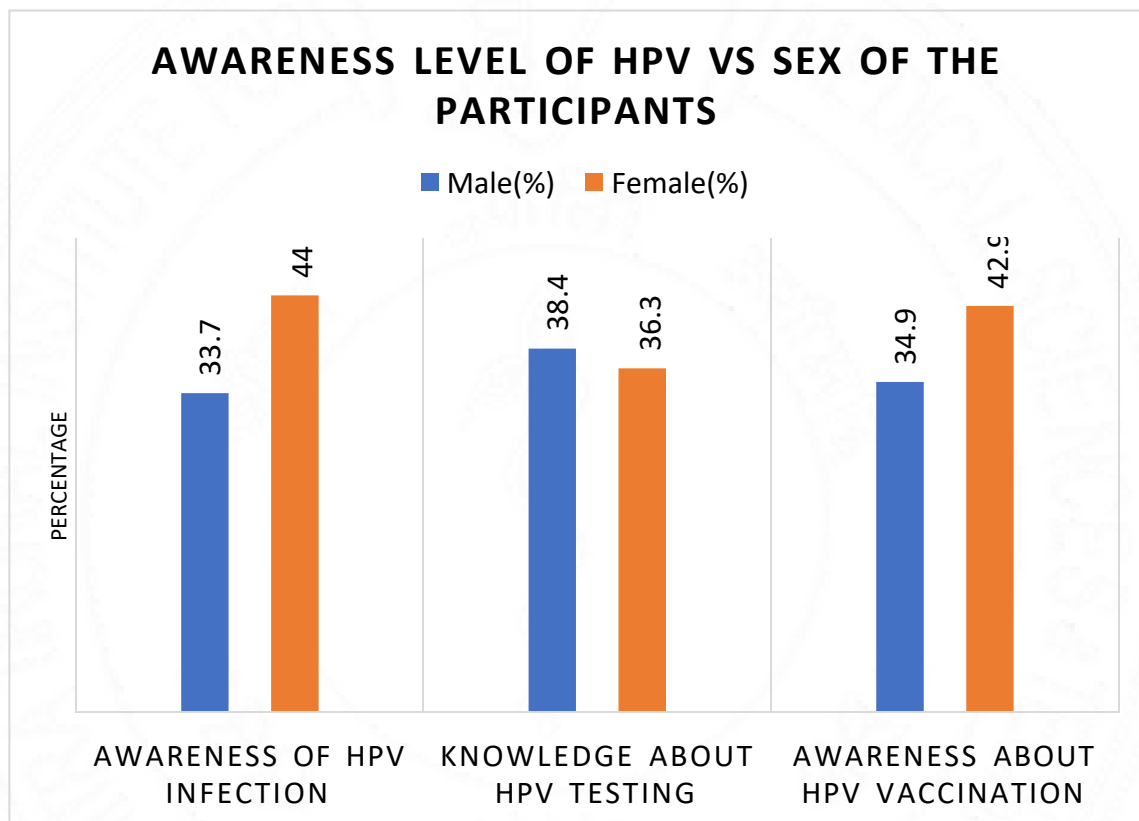


Figure.3.2 Awareness of HPV infection, testing, and vaccination among males and female students.

The Figure 3.3 displays the awareness levels of HPV among participants based on their academic year. In the first year, 37.2 percent were aware of HPV infection, while 35.9 percent had knowledge about HPV testing and 34.6 percent were aware of HPV vaccination. For second-year participants, the awareness percentages were slightly lower,

with 36.5 percent aware of HPV infection, 30.7 percent knowledgeable about HPV testing, and 35.3 percent aware of HPV vaccination. Participants classified under "others"(fourth years & house surgeons) exhibited significantly higher awareness levels, with 67.7 percent aware of HPV infection, 66.2 percent knowledgeable about HPV testing, and 80 percent aware of HPV vaccination.

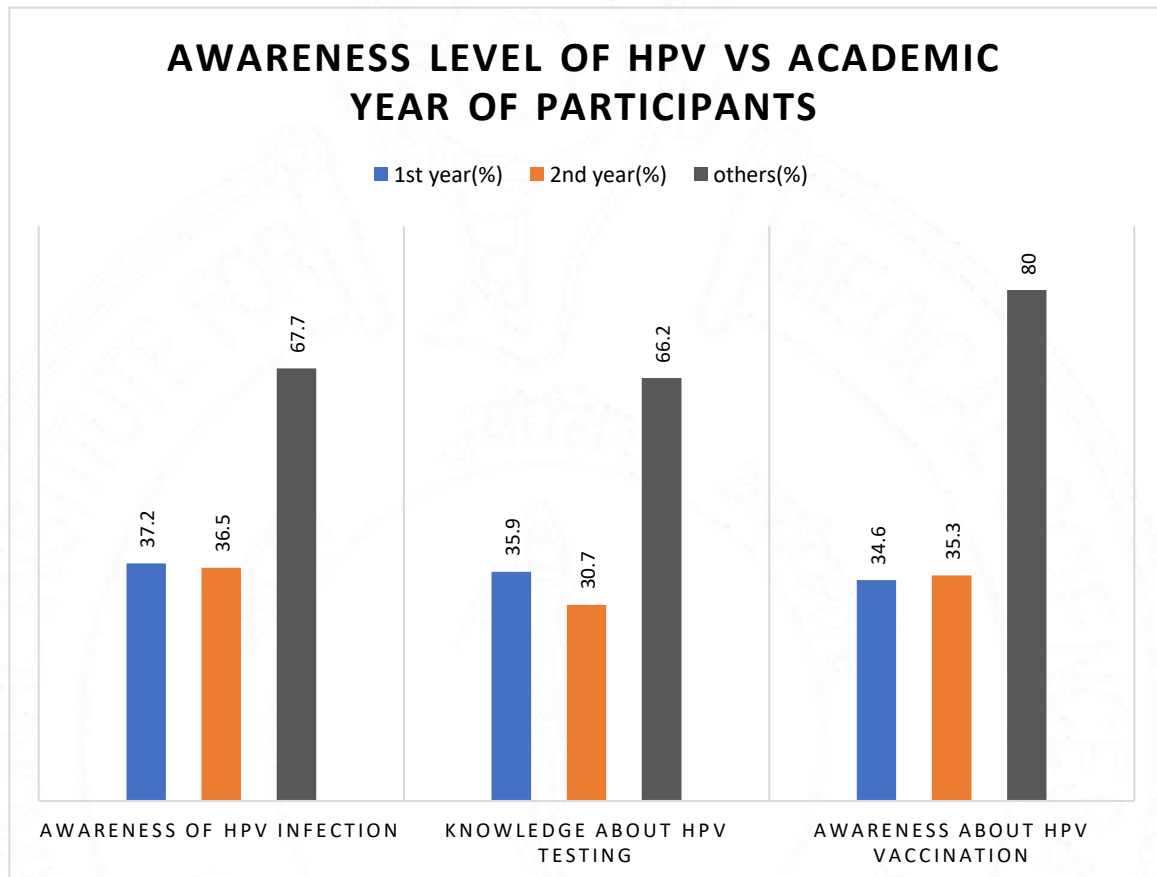


Figure.3.3 Awareness of HPV infection, testing, and vaccination among students from different academic years

3.5 Attitudes and perceptions related to HPV Vaccination

The section on attitudes and perceptions related to HPV vaccination aims to explore various factors influencing individuals' decisions and opinions regarding HPV vaccination. These statements taken into consideration of the factors such as financial accessibility, willingness to get vaccinated under different circumstances, potential barriers like embarrassment or parental approval, perceptions about the necessity of vaccination, and attitudes toward

recommending the vaccine to others, including friends, colleagues and future clients.

Table 3.6 Attitude and perceptions regarding HPV vaccination

	Agree (%)	Disagree (%)	Neutral (%)	Total
I think my parents/guardians could pay for the vaccine	421(75.9)	48(8.6)	78(14.1)	547
I would get the vaccine if it were for free.	452(81.4)	24(4.3)	74(13.3)	550
I would pay for the vaccine if I could.	420(75.7)	48(8.6)	80(14.4)	548
I would be embarrassed to ask my parents/guardians about vaccination	81(14.6)	413(74.4)	52(9.4)	546
It's not necessary for me to get the vaccination	44(7.9)	416(75)	85(15.3)	545
Vaccinating young people against HPV would encourage them to become sexually active	119(21.4)	274(49.4)	151(27.2)	544
If I get the vaccination, it's not necessary for me to be protected against other sexually transmitted infections.	175(31.5)	305(55)	58(10.5)	538
Only sexually active women should receive the vaccine.	38(6.8)	444(80)	59(10.6)	541
My parents would not allow me to get the vaccine.	29(5.2)	446(80.4)	70(12.6)	545
I wish to get more information about HPV and HPV - vaccination.	463(83.4)	19(3.4)	63(11.4)	545
I would recommend it to my friends, colleagues and relatives	473(85.2)	13(2.3)	60(10.8)	546
I would recommend it to my future clients	486(87.6)	8(1.4)	48(8.6)	542

A generally positive inclination towards vaccination was demonstrated by the data pertaining to participants' attitudes and views surrounding HPV vaccination. Seventy-five percent of respondents said they were confident their parents or guardians could cover the cost of the vaccine. Furthermore, 81.4 percent of respondents said they would receive the vaccination if it were free. Comparably, 75.7 percent of respondents said they would be happy to pay for the vaccine if they could afford it. Nearly 15 percent of participants said they would be embarrassed to ask their parents/guardians about vaccination, and nearly

eight percent said it is not necessary for them to get the vaccination.

There were some open-ended questions also included in the questionnaire to capture the perceptions. Respondents were encouraged to share their reasons for recommending or not recommending HPV vaccination, discuss perceived barriers to implementation, and offer any additional suggestions or opinions related to the topic.

3.6 The reasons for recommending/Not recommending HPV vaccination

Nearly 88 percent of the participants reported that they will recommend the vaccine in future, however the reason was explained only by a small fraction of participants (14%), and the relevant responses to the question was very few, mostly highlighting the preventive aspect of the vaccine against cervical cancer and anogenital warts. Among the participants who reported that they will not recommend HPV vaccination were asked about the reasons for not recommending the vaccine, and the reasons were explained by very few students, and the reported reasons were mainly: Lack of awareness about the vaccine, affordability (cost of the vaccine) of the vaccine and embarrassment.

3.7 Barriers for receiving HPV Vaccination

The responses regarding the barriers for receiving HPV vaccination reveal several common themes. Financial factors, such as the high cost of the vaccine, was mentioned as a major barrier, particularly for economically disadvantaged individuals. Another major barrier highlighted by many participants is the lack of awareness and knowledge about HPV and the vaccine. This includes misconceptions, misinformation, and a general lack of understanding about the disease and the importance of vaccination. Another significant barrier mentioned is the social stigma associated with sexually transmitted diseases (STDs) and vaccination against them. Participants responded that societal attitudes and beliefs, including taboos surrounding sexual health discussions, contribute to reluctance in seeking HPV vaccination. Moreover, concerns about potential side effects, fear of judgement from

others, and cultural barriers were mentioned by some respondents. Fear of vaccines was also mentioned as a barrier by few participants. Overall, the majority of responses indicate that the main barriers to HPV vaccination implementation are the factors including lack of awareness, social stigma, cost, and misconceptions about the vaccine and STDs.

3.8 On receiving any formal classes or training on HPV vaccination, and vaccination is offered at institution

Responses varied concerning formal classes or training on HPV vaccination across different institutions. While some respondents reported receiving formal education, others indicated there was no formal training. Among 334 respondents, 60% stated they had not received any formal classes. The majority of participants are largely uninformed about whether vaccination is offered at their institution.

3.9 Suggestions and recommendations given by the participants

Based on the suggestions and opinions provided, there are several key points to consider regarding HPV vaccination and awareness: Many respondents highlighted the need for more awareness about HPV, its transmission, associated diseases, and the importance of vaccination. This includes conducting awareness classes, campaigns, and providing information to the public, especially in rural areas. Several respondents mentioned the importance of making the HPV vaccine more accessible and affordable, particularly for economically disadvantaged individuals. Suggestions included reducing the cost of the vaccine, providing it for free to certain groups (e.g., medical students, female staff), and conducting routine vaccination drives or camps. Suggestions were made for government initiatives to raise awareness, include HPV vaccination in national immunization programs (NIPs). Institutions were also encouraged to offer HPV vaccination as part of their routine healthcare services. Some respondents emphasized the importance of sex education, routine screening tests, and regular check-ups to prevent and detect HPV-related diseases early.

CHAPTER 4

DISCUSSION AND CONCLUSION

The study was conducted among medical students aimed to assess the medical students understanding of HPV infection, HPV testing vaccination, perceptions towards HPV vaccination, and factors influencing vaccination decisions.

4.1 HPV awareness among medical students

Human Papillomavirus (HPV) infection is a prevalent sexually transmitted infection (STI) known to cause various health issues, including cervical cancer, Ano-genital warts, and penile cancers. In medical education, understanding HPV and its implications is crucial, given its impact on public health. This discussion delves into the awareness levels among medical students regarding HPV infection, and highlighting notable misconceptions.

It's encouraging to observe that majority of participants in our study correctly recognized HPV as a sexually transmitted infection (93.1%), aligning closely with findings from a study among young medical professionals in Bangladesh, where 92.1 percent had similar awareness levels. (Singh et al., 2022). Another study on HPV vaccine knowledge and coverage among female students in a medical college in Kerala, 91.5 percent of participants were aware of the sexual transmission of HPV. (E and Francis, 2018) On contrary, In a study done in Meerut about Awareness of HPV vaccine among MBBS Students and Paramedical staffs, 55 percent of students believe that HPV infection can spread through both sexual and non-sexual routes, while 38 percent believed it's only through sexual contact. (Mehta et al.,2013)

More than 80 percent of the participants in our study were aware that HPV can cause cervical cancer. While the study conducted in 2022 involving the MBBS students in Meerat reported that the awareness was about 95 percent. (Singh et al., 2022) Another study conducted by Pandey et al., a large majority of participants (89.6%) demonstrated good

awareness of various risk factors associated with cervical cancer development and its connection to HPV. (Pandey et al., 2012). However, study conducted in 2017 among 200 MBBS students, 60 percent only correctly identified the link between HPV and cervical cancer (Ganju et al., 2017). The awareness levels observed in these studies highlight the need for education and awareness campaigns to ensure a comprehensive understanding of HPV-related risks and prevention strategies.

Our study shows only 34 percent knows that HPV is asymptomatic, which is slightly lesser than another study conducted among medical students in Karnataka which stated 40 percent. (C and Hegde, 2022) While responding to the curability, 70.2 percent of participants in our study correctly said that HPV infection is not curable by antibiotics similar to a study done by Ganju et al., among medical and nursing students (Ganju et al., 2017)

The present study also uncovered notable misconceptions among participants, such as the belief that HPV is uncommon (59.7%) and the misconception that visible signs or symptoms often accompany genital HPV infection (64.6%). More than half of the participants (58.6%) had a major misbelief about HPV that it cannot cause penile cancer which is better than the awareness observed in a survey among dental students and professionals which shows less than 10 percent were aware that HPV can cause penile cancer. (Sallam et al., 2022).

A recent study that was published in *The Lancet Global Health* found that one in five males over the age of 15 had one or more of the high risks, or oncogenic, HPV types, and that roughly one in three men over the age of 15 have at least one genital HPV type infection. Based on estimations, it is important to incorporate males in efforts to manage HPV infection and lower the incidence of HPV-related diseases in both men and women. Males are known to harbor genital HPV infections regularly. (de Martel et al., 2020)

In terms of preventive measures, while a major proportion recognized the partial protection offered by condoms against HPV (81.9%), which is similar to study done by Mehta et al,

where 80 percent opinioned that condoms prevent HPV infection.(Mehta et al., 2013)But there was confusion regarding the protective role of contraceptive pills in the present study, about 38 percent of participants said pills protect from HPV. This emphasizes the necessity of clear and accurate information dissemination regarding HPV prevention strategies. Overall, these findings underscore the importance of focused educational campaigns aimed at correcting misconceptions, enhancing awareness of HPV prevalence and transmission, and promoting effective prevention strategies such as vaccination, screening, and safe sexual practices.

4.2 Awareness about HPV Testing

The HPV Testing Knowledge Scale (HTKS) evaluation among participants revealed a mix of accurate understanding and misconceptions regarding HPV testing. More than half of participants correctly understood that an HPV-positive result does not mean having cervical cancer (55.7%) and recognized the necessity for further follow-up after such a result (85.2%),which is slightly lesser than study done among female medical students in Kerala, where 91percentrespondents knew that screening for cervical cancer has to be continued even after vaccination(E and Francis, 2018).This noteworthy variation might have resulted from variations in the research population. Most of the other studies there is very few questions regarding HPV testing and screening for HPV.

Many participants incorrectly believed (69.2%) that an HPV test could determine the duration of HPV infection and that an abnormal Pap test result was equivalent to finding HPV during testing (81.8 %).Moreover, the survey highlighted a lack of awareness about self-sampling for HPV testing, with only a small minority recognizing this option (26.1%),which is better when compared to a study done among female university students which showed 95percent doesn't even heard about self-sampling for HPV testing.(Eche and vermark, 2022).

Though there are lot of studies related to awareness about HPV Infection and vaccination, not many studies reported knowledge about HPV testing among medical students, thus limits the comparison with other studies in this regard. However, the findings from the present study underscore the critical need for enhanced public education initiatives focused on HPV testing procedures, including self-sampling options, and the importance of follow-up care after an HPV-positive result. Improving knowledge in these areas could potentially impact the management of HPV-related health risks, particularly cervical cancer, by facilitating early diagnosis, prevention, and treatment strategies.

4.3 Awareness regarding HPV vaccination

The survey results on awareness regarding HPV vaccination revealed a mix of accurate understanding and misconceptions among participants. A significant majority correctly acknowledged that the HPV vaccine prevents HPV infection (82.7 %) and identified the approved age range for vaccination (58.2 %), however, there were notable gaps in knowledge also. Nearly half of the respondents were aware of the vaccine's preventive role against cervical cancer (53.3%), which is similar to the observations from a cross-sectional study conducted among the undergraduate medical students of All India Institute of Medical Sciences, Jodhpur. (Sharma et al., 2020),

The ability of the vaccine to prevent genital warts was correctly identified by 42 percent of participants in the study. Nearly 90 percent of participants incorrectly reported that vaccination is contraindicated in lactating or breastfeeding females.) and that it is not recommended if a person is HPV DNA positive (17.3%), despite evidence supporting vaccination post-HPV exposure.(Human Papillomavirus (HPV) Vaccines - NCI, 2021)

In study conducted among in first year students entering university in Western Turkey on awareness and willingness about HPV vaccine among first-year students, they found poor knowledge levels, with only 11.6percentof females intending to be vaccinated.(Durusoy et

al., 2010) In contrast, our study showed that 40 percent of participants had awareness regarding vaccine. Whereas a study done in 2021 among medical students in Belagavi shows high awareness (79%) of the participant regarding HPV vaccine.(Singh and Baliga, 2021)

Addressing the misconceptions and providing clear, accurate information about HPV vaccination are crucial in maximizing the public health impact of vaccination programs. The level of knowledge about HPV infection, testing, and vaccination among medical students is a critical aspect of their training and readiness to address public health issues related to HPV.

Only 40.4 percent demonstrated good knowledge about HPV infection, indicating a notable gap in understanding this fundamental aspect of public health. Similarly, awareness about HPV testing was relatively low, with only 37.5 percent showing good knowledge. Furthermore, knowledge about HPV vaccination was also limited, with only 40.1 percent demonstrating good awareness in this area.

Comparing our findings with a study conducted among medical students in Bangladesh, which reported a similar level of awareness about HPV infection and vaccination at 43.2 percent, we can observe a consistent trend of moderate knowledge levels among medical students across different regions.(Chowdhury et al., 2022)However, studies conducted in Malaysia and in South West Nigeria revealed higher levels of knowledge at 62.9 percent and 67.1 percent, respectively.(Adejuyigbe et al., 2015; Rashwan et al., 2012)

In terms of HPV vaccination knowledge, our study showed a slight decrease in awareness compared to a study conducted in 2016 by (Swarnapriya et al., 2016), which reported a knowledge level of about 44.9 percent.

This decline underscores the ongoing need to enhance education and awareness initiatives focused on HPV infection, testing, and vaccination among medical students ensuring that

future healthcare professionals are well-prepared to advocate for HPV prevention strategies. In the present study, female students exhibiting higher levels of awareness, particularly about HPV infection (44% compared to 33.7% in males) and vaccination awareness (42.9% compared to 34.9% in males), indicates a potential greater exposure to HPV-related information among female students outside of formal education. Male participants having comparatively lower level of awareness than the females was also stated in a study done among medical students at Midwestern university in USA.(Du et al., 2022) However, the knowledge regarding HPV testing was something similar between males and females. Overall, acknowledging and addressing gender differences in HPV-related knowledge and awareness among medical students can contribute significantly to building a well-rounded healthcare workforce capable of effectively addressing HPV-related public health challenges.

4.4 Attitude and perceptions regarding HPV Vaccination

The section on attitudes and perceptions related to HPV vaccination provides valuable insights into the factors influencing individuals' decisions and opinions regarding HPV vaccination. The study explores various aspects such as financial accessibility, willingness to get vaccinated, potential barriers like embarrassment or parental approval, perceptions about vaccination necessity, and attitudes toward recommending the vaccine to others.

One key finding from the study is the generally positive inclination towards vaccination among the participants. Many participants (76%) believed that their parents or guardians could pay for the vaccine, indicating a perceived financial accessibility. Moreover, a large majority (81.4%) expressed willingness to get vaccinated if the vaccine were free. Similar results were there in a study on the attitude towards vaccination among female medical students in Kerala found that 83 percent of participants expressed willingness to take the HPV vaccine. (E and Francis, 2018) In contrast, study by Mehta et al among medical

students in Delhi reported that 88 percent of their study respondents were willing to take the vaccine, while Kamini et al found that only 64 percent expressed willingness. by (Kamini and Bhimarasetty, 2016)

The study also sheds light on participants' attitudes regarding recommending the HPV vaccine to others and the perceived need for awareness. More than 80 percent expressed willingness to recommend the vaccine to friends, colleagues, and relatives, indicating a positive stance towards promoting vaccination within their social circles. Furthermore, 87.6 percent stated they would recommend the vaccine in the future when they practice medical service, underscoring a professional commitment to advocating for vaccination. Similar study conducted among undergraduate medical students in Rajasthan suggested that 96.5 percent respondents agreed to recommend the vaccine to others.(Sharma et al., 2020)

However, some barriers and hesitancies were also identified. Some participants expressed potential embarrassment in asking their parents or guardians about vaccination, suggesting communication challenges that could affect vaccine uptake. Similarly, a few others believed that vaccination was unnecessary, indicating a minor yet significant hesitancy towards vaccination among the participants. According to the study by E and Francis in 2018, a small percentage (9%) of participants expressed concerns that vaccination might encourage promiscuity.(E and Francis, 2018)

The findings from the open-ended questions regarding perceptions about HPV vaccination among respondents highlight a strong advocacy for vaccination due to its role in disease prevention, especially cervical cancer and genital warts linked to HPV infection. This reflects a proactive approach toward disease control and emphasizes the importance of vaccination in averting life-threatening conditions.

The respondents also revealed potential barriers in the community towards HPV vaccination, including lack of awareness, cost, accessibility issues, social stigma, and

cultural beliefs. These findings are consistent with studies done by Shetty et al, among undergraduate medical students in South India, highlighting similar challenges faced in promoting HPV vaccination uptake. Addressing these barriers through targeted educational initiatives, cost reduction strategies, and culturally sensitive approaches is crucial in improving vaccination rates and ensuring equitable access to HPV vaccination, as recommended by participants in the survey.

4.5 Strength and Limitations of the study

The strength of the study lies in its relevance to current discussions on HPV vaccine development and implementation. This is crucial as ongoing debates and advancements in this area are driving research and innovation, making the study's findings pertinent and valuable to the broader scientific and medical community.

However, in contrast, the study faced several limitations. Firstly, the planned recruitment from four medical colleges in Thiruvananthapuram was hindered by one institution's refusal to grant permission. This limitation could have influenced the diversity and representativeness of the study sample, potentially impacting the generalizability of the results.

Secondly, the inability to conduct random selection of participants from each academic year posed a challenge to the generalizability. Lastly, the participants were limited to first and second-year students. While focusing on these early years of medical education can provide valuable insights, it also restricts the scope of the study to a specific subset of students. This limitation could affect the overall applicability of the findings to the broader medical student population or to students at later stages of their education.

4.6 Conclusion and Recommendations

The study on HPV awareness, knowledge, and vaccination practices among medical students has provided valuable insights into the current landscape of understanding and

perceptions regarding HPV infection and vaccination. The findings revealed a mixed scenario, with varying levels of awareness and knowledge among participants. While there were positive signs of awareness about HPV as a sexually transmitted infection, its association with cervical cancer, and the importance of screening, there were major gaps in knowledge regarding HPV testing procedures, misconceptions about vaccination, and barriers hindering vaccination adoption. The study also highlighted differences in awareness levels between males and female students. The results highlight the critical need for focused educational initiatives, more accessible vaccination programs, and extensive public awareness efforts to close knowledge gaps, clarify myths, and encourage well-informed choices about HPV preventive measures.

To address the knowledge gaps identified among medical students regarding HPV infection, testing, and vaccination, it is recommended to implement comprehensive educational programs designed specifically for this population. These programs should focus on enhancing understanding and awareness of HPV-related topics, including transmission routes, associated health risks, preventive measures like screening, and the importance of vaccination. Additionally, awareness campaigns should be designed and promoted to target both male and female medical students, taking into account the observed differences in knowledge levels. These campaigns should aim to clarify misconceptions, dispel myths, and emphasize the role of healthcare professionals in advocating for HPV prevention strategies. Furthermore, efforts should be made to enhance access to HPV vaccination services for medical students by collaborating with healthcare institutions and authorities. This could involve setting up vaccination clinics within medical college premises, offering subsidized or free vaccination programs, and ensuring that accurate information about the vaccine's safety and efficacy is readily available to students.

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ANNEXURE 1

PARTICIPANT INFORMATION SHEET (ENGLISH)

Achutha Menon Centre for Health Science Studies (AMCHSS)

Sree Chitra Tirunal Institute for Medical Sciences & Technology

(SCTIMST)

Trivandrum

INFORMATION SHEET

Awareness regarding Human Papilloma Virus (HPV) infection and its prevention- A cross sectional study among medical students in Trivandrum

I, Dr Adya Reghu, a final year Master of Public Health (MPH) student at AMCHSS, am conducting a research study on Awareness regarding Human Papilloma Virus (HPV) infection and its prevention among medical students in Trivandrum, Kerala. Your participation in this study is highly valuable. This information sheet is designed to provide you with essential details about the study to help you make an informed decision regarding participation.

Purpose of the study

The primary objective of this study is to assess the extent of awareness regarding Human Papilloma Virus Infections (HPVs) and its prevention among medical students in Trivandrum.

Study Procedures

If you decide to participate, you will be asked to fill a structured Questionnaire. It will take 15-20 minutes to fill up the questionnaire. You are free to answer at your own pace, and if you are uncomfortable with any question, you may skip it.

Confidentiality

Your participation in this study is voluntary, and all the information you provide will

be kept strictly confidential. Your personal details will not be disclosed in any research reports or publications. Data will be analyzed in an aggregate form to ensure anonymity.

Risks and Benefits

There are no known risks associated with participating in this study. While there may not be direct benefits to you, by participating in this study, you will contribute to the advancement of knowledge in the field of HPV awareness and prevention. Your input will help us better understand the awareness levels, knowledge, and attitudes of medical students, potentially leading to improvements in HPV education and prevention strategies

Participation and Withdrawal

Your participation in this study is entirely voluntary. You have the right to withdraw from the study at any time during the interview without any penalty or loss of benefits. You may choose not to answer any specific questions that make you uncomfortable.

Contact Information

If you have any questions or concerns about the study, you can contact me, Dr Adya Reghu (MPH Student at AMCHSS, SCTIMST, TVM). If you have concerns about your rights as a research participant, you may contact the Institutional Review Board (IRB) at AMCHSS, SCTIMST, TVM.

PRINCIPAL INVESTIGATOR

Dr Adya Reghu

AMCHSS, SCTIMST

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Phone no: 9496331745

IRB Member Secretary:

Dr Srinivas G,

Institutional Ethics Committee, SCTIMST

Email: iec.mem.sec@sctimst.ac.in ; Phone: 04712524689 (office)

ANNEXURE 2

Achutha Menon Centre for Health Science Studies

(AMCHSS)

Sree Chitra Tirunal Institute for Medical Sciences & Technology

(SCTIMST), Trivandrum

Consent Form

I----- have read/ heard and understood all the information provided in the research information sheet. I understand that my participation in this study is entirely voluntary. By signing/ putting thumb impression I confirm my voluntary participation in this study. I understand that I can withdraw my participation at any time during the interview without any explanation and I also understand that my identity and personal information will be kept confidential. I have been informed who should be contacted for further clarifications. I agree to take part in this study.

Name of the Participant:

Signature of the Participant:

Thumb Impression (if unable to sign):

Date:

Serial number:

ANNEXURE 3

Questionnaire

Awareness regarding Human Papillomavirus (HPV) Infection and its Prevention among Medical Students in Trivandrum

Serial number:

Date _/ _/ _

Code of institution
(Filled by the investigator)

1	2	3	4
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Year of study

1	2	3	4	5
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Questionnaire Instructions for Respondents

Welcome to our HPV awareness and prevention questionnaire for medical students.

Your honest responses are vital for our research on HPV-related knowledge and attitudes among students.

Please carefully read and follow these instructions before you begin:

In the following sections, you will find questions related to HPV awareness, knowledge, and attitudes. Each question provides response options or spaces for your answers.

Please put a tick mark on the most appropriate response or provide your insights as accurately as possible.

To fulfil the purpose of this questionnaire, we kindly request that you do not skip any questions.

"Thank you for participating in this questionnaire. We would like to ask for your consent to contact you for further discussions or follow-up related to this study. If you are willing to be contacted, please provide your preferred contact method (email or phone number) below:

Preferred Contact Method: _____

Section 1: Basic Information

Section 1: Basic Information			
Sl. No	Questions	Options	code
1	Age		
2	Gender	Male	1
		Female	2
		Transgender	3
		Prefer not to say	4
3	Academic Year	1 st year	1
		2 nd year	2
		3rd Year	3
		4th Year	4
		House Surgeon	5

Section 2: Awareness statements on HPV infection

Sl. No	Section 2: Awareness statements on HPV infection		Put tick mark here
	(Please select one from options)		
1	HPV is a sexually transmitted disease	Yes	
		No	
		Don't know	
2	HPV can cause cervical cancer	Yes	
		No	
		Don't know	
3	HPV can cause Ano-genital warts	Yes	
		No	
		Don't know	
4	HPV can cause penile cancers	Yes	
		No	
		Don't know	
5	A person might be infected without knowing	Yes	
		No	
		Don't know	
6	HPV can be cured by taking antibiotics	Yes	
		No	
		Don't know	
7	HPV can heal by itself (HPV is transient)	Yes	
		No	
		Don't know	
8	Contraceptive Pills protect against HPV	Yes	
		No	
		Don't know	
9	Using a condom can provide partial protection against HPV	Yes	
		No	
		Don't know	
10	There is a simple vaginal test to find out if you've got HPV	Yes	
		No	
		Don't know	
11	It's important for women to be screened for HPV	Yes	
		No	
		Don't know	
12	Most people with genital HPV-infection have visible signs or symptoms	Yes	
		No	
		Don't know	
13	HPV infection is very common.	Yes	
		No	
		Don't know	

Section 3: HPV Testing Knowledge Scale (HTKS)

Section 3: HPV Testing Knowledge Scale (HTKS)			
Sl. No	Please mark below said statements as True/False		Put tick mark here
1	An HPV test can tell a woman how long she has had HPV.	True	
		False	
		I don't know	
2	An HPV test can be done at the same time as a Pap test	True	
		False	
		I don't know	
3	If the HPV test shows that a woman has HPV, this means she is at increased risk for cervical cancer.	True	
		False	
		I don't know	
4	If the HPV test shows a woman has HPV, this means she already has cervical cancer.	True	
		False	
		I don't know	
5	If the HPV test shows a woman has HPV, this means she needs further follow-up	True	
		False	
		I don't know	
6	The HPV test sample can be collected by the woman herself using a specialized HPV self-sampling kit	True	
		False	
		I don't know	
7	Women who have received the HPV vaccine do not need the HPV test	True	
		False	
		I don't know	
8	If HPV is found during HPV testing, this is the same thing as an abnormal Pap test result	True	
		False	
		I don't know	

Section 4: Awareness statements on HPV vaccination

Sl. No	Section 4: Awareness statements on HPV vaccination		Put tick mark here
1	HPV vaccine prevents HPV infection	Yes	
		No	
		Don't know	
2	HPV vaccine prevents cervical cancer.	Yes	
		No	
		Don't know	
3	HPV vaccine prevents genital warts.	Yes	
		No	
		Don't know	
4	Approved age for vaccine is 9-26 years.	Yes	
		No	
		Don't know	
5	Required number of doses for vaccine is 3 universally.	Yes	
		No	
		Don't know	
6	If a person is HPV DNA positive, the vaccine is not recommended.	Yes	
		No	
		Don't know	
7	There are three types of HPV vaccines available.	Yes	
		No	
		Don't know	
8	Vaccine is contraindicated in lactating/breast feeding females.	Yes	
		No	
		Don't know	


Section 5: Attitudes and perceptions related to HPV vaccination

Sl. No	Section 5: Attitudes and perceptions related to HPV vaccination		Put tick mark here
1	I think my parents/guardians could pay for the vaccine	Agree	
		Disagree	
		Neutral	
2	I would get the vaccine if it were for free.	Agree	
		Disagree	
		Neutral	
3	I would pay for the vaccine if I could.	Agree	
		Disagree	
		Neutral	
4	I would be embarrassed to ask my parents/guardians about vaccination.	Agree	
		Disagree	
		Neutral	
5	It's not necessary for me to get the vaccination.	Agree	
		Disagree	
		Neutral	
6	Vaccinating young people against HPV would encourage them to become sexually active	Agree	
		Disagree	
		Neutral	
7	If I get the vaccination, it's not necessary for me to be protected against other sexually transmitted infections.	Agree	
		Disagree	
		Neutral	
8	Only sexually active women should receive the vaccine.	Agree	
		Disagree	
		Neutral	
9	My parents would not allow me to get the vaccine.	Agree	
		Disagree	
		Neutral	
10	I wish to get more information about HPV and HPV-vaccination.	Agree	
		Disagree	
		Neutral	
11	I would recommend it to my friends, colleagues and relatives.	Agree	
		Disagree	
		Neutral	
12	I would recommend it to my future clients.	Agree	
		Disagree	
		Neutral	

Sl. No	Please try to answer in your own words.	
1	Can you tell why do you recommend HPV vaccination? (if answer to q12 is yes)	
2	Can you tell why do you do not recommend HPV vaccination? (if answer to q12 is Disagree or neutral)	
3	Do you think there are certain barriers for implementing HPV Vaccination? If so, in your opinion, what are the main barriers that prevent people from getting vaccinated against HPV?	
4	Could you please share whether you have received any formal classes or training on HPV vaccination at this institution?	
5	Can you provide insights into whether the institution routinely offers HPV vaccination as part of its healthcare services?	
6	Any other suggestions/ Opinions	

ANNEXURE 4

IEC Approval letter


श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram - 695 011, Kerala, India
(An Institute of National Importance under Govt. of India)
Grams : Chitramet, Phone : +91-471-2443152, Fax : +91-471-2550728 / 2446433, E-mail : sct@sctimst.ac.in, Website : www.sctimst.ac.in

Institutional Ethics Committee

CDSCO Registration No: ECR/189/Ins/KL/2013/RR-21
DHR Registration No: EC/NEW/INST/2022/2775

SCT/IEC/2163/DECEMBER/2023

12.01.2024

Dr. Adya Reghu
MPH Student, AMCHSS
SCTIMST, Thiruvananthapuram

Dear Dr. Adya Reghu,

The Institutional Ethics Committee held on 30th December, 2023, reviewed and discussed your application to conduct the study titled "AWARENESS REGARDING HUMAN PAPILLOMA VIRUS (HPV) INFECTION AND ITS PREVENTION- A CROSS SECTIONAL STUDY AMONG MEDICAL STUDENTS IN TRIVANDRUM" (IEC /2163) "

Principal Investigator	Dr. Adya Reghu, MPH Student, AMCHSS, SCTIMST
Co-Principal Investigator(s)	Dr. Jissa V T., Scientist C, AMCHSS, SCTIMST
Duration of the study	3 months

The following members of the Ethics Committee were present at the meeting held on 30th December, 2023

SL. No.	Member Name	Highest Degree	Gender	Scientific /Non Scientific	Affiliation with Institution(s)
1.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
2.	Dr. Kala Kesavan P	MBBS,MD	Female	Basic Medical Scientist	No
3.	Adv. Priya Kaimal	LLM, MBL	Female	Legal Expert	No
4.	Dr. P. Manickam	BSMS, MSc (Epid), PhD	Male	Health Science Expert/ Social Scientist	No
5.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
6.	Dr. Narayanan Namboodiri. K K	MBBS,MD,DM	Male	Clinician	Yes
7.	Dr. Biju Soman	MBBS,MD, DPH, MSc, DLSHTM	Male	Basic Medical Scientist	Yes

The following documents were reviewed:

Original submission

1. Checklist Form
2. Covering letter addressed to the Chairman, IEC, SCTIMST dated 30.11.2023
3. Responses /amendments made based on the Reviewer's comments
4. IEC Application Form
5. Research Proposal
6. Information Sheet English
7. Consent Form in English
8. Questionnaire
9. CV of Principal Investigator and Co-PI
10. Declaration Form
11. SRC Recommendation Letter

Revised submission

1. Checklist Form
2. Covering letter addressed to the Chairman, IEC, SCTIMST dated 01.11.2023
3. Responses /amendments made based on the Reviewer's comments
4. IEC Application Form
5. Research Proposal
6. Information Sheet English
7. Consent Form in English
8. Questionnaire
9. CV of Principal Investigator and Co-PI
10. Declaration Form

IEC Decision

The IEC approved the conduct of the study in the present form.

Remarks:

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team / Guide who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,



Dr. G. Srinivas
Member Secretary, IEC

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE (IEC)
SCTIMST, THIRUVANANTHAPURAM



ANNEXURE 5

Originality Report



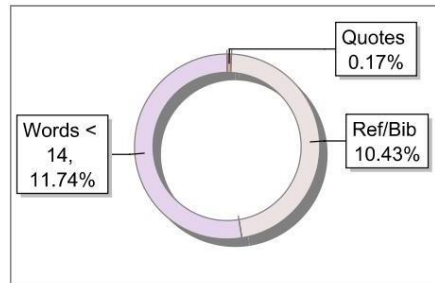
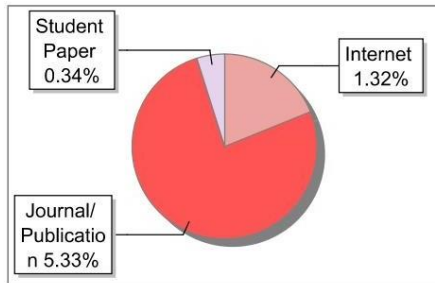
The Report is Generated by DrillBit Plagiarism Detection Software

Submission Information

Author Name	Adya Reghu
Title	Awareness regarding Human Papilloma Virus (HPV) infection and its prevention - A cross sectional study among medical students in Trivandrum
Paper/Submission ID	1710396
Submitted by	jissa@sctimst.ac.in
Submission Date	2024-04-28 20:40:19
Total Pages	49
Document type	Dissertation

Result Information

Similarity **7 %**



Exclude Information

Quotes	Excluded
References/Bibliography	Excluded
Sources: Less than 14 Words %	Excluded
Excluded Source	8 %
Excluded Phrases	Excluded

Database Selection

Language	English
Student Papers	Yes
Journals & publishers	Yes
Internet or Web	Yes
Institution Repository	Yes

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