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Research Article

Knowledge regarding Human Papilloma Virus, Related Diseases and Preventive Measures Among Female Undergraduates of a Selected University in Sri Lanka

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Abstract

Background and objective: Increasing awareness of human papilloma virus (HPV), its related diseases and preventive measures among young female population play a major role in reducing the associated health risk This cross-sectional study was aimed to assess knowledge and associated factors regarding human papilloma virus, related diseases and preventive measures among female undergraduates at the University of Ruhuna (UoR), Sri Lanka.

Methods: Female undergraduates (n=400) from five Faculties (Medicine, Allied Health Sciences, Engineering, Management and Finance and Humanities and Social Sciences) of UoR were included in the study (80 from each faculty). They were selected by one-stage cluster sampling. The data were collected using a pre-tested, self-administered questionnaire with 45 statements to assess knowledge. The knowledge score was calculated by giving one point to a 'true' answer and zero point to a 'false' and 'no idea' answers. The level of knowledge was divided in to three categories as Poor (0 – 15), Average (16 – 30) and Good (31 – 45). Descriptive statistics and Chi square/Fishers' exact test were used for analysis with SPSS Version 25.

Results: The mean±SD knowledge score was 18.49±11.97. Only 38.3% (n=153) of undergraduates had good knowledge while 31.8% (n=127) had average and 30% (n=153) had poor knowledge. Level of knowledge was associated with age ($p<0.001$), faculty ($p<0.001$) and academic year ($p<0.001$). Comparatively high proportion of female undergraduates aged 24-30 years, studying in Faculty of Medicine and Allied Health Sciences in their final academic years had good level of knowledge compared to the counterparts.

Conclusions: Inadequate knowledge regarding HPV, related disease and preventive measures was seen among female undergraduates of UoR. Level of knowledge was associated with the age, faculty of studying and academic year of the female undergraduates. Educational programmes on HPV and cervical cancers could be promoted among female undergraduates to popularize the related awareness.

***Key words**: knowledge, female undergraduates, Human Papilloma virus*

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Introduction

Cervical cancer is the second most common cancer among females all over the world (Gamage, 2018; Sankaranarayanan et al., 2008). It is the second among all the cancers in Sri Lanka (Gamage, 2018; Sankaranarayanan et al., 2008) which is a leading cause of death (Gamage, 2018; Karunaratne et al., 2014). Approximately 700 deaths have been reported annually in Sri Lanka due to this cancer (Shanaka et al., 2018). It is the major complication of HPV while many other types of cancers and diseases are occurred due to HPV related infections (Schiffman et al., 2007). In Sri Lanka, the prevalence of HPV infection in women with invasive cervical cancer is 84.7%, and out of them 98.8% are due to single HPV type and 1.2% had multiple HPV type infection (Karunaratne et al., 2014; Shanaka et al., 2018). The prevalence of HPV infection in women with squamous cell carcinoma and adenocarcinoma of the cervix is 90% (Karunaratne et al., 2014; Shanaka et al., 2018).

Socio-cultural and socioeconomic factors, as well as infections, poor nutrition, and lack of screening programmes contribute to the higher magnitude of this problem in developing nations including Sri Lanka as compared to the industrialized countries (Ali et al., 2012; Karunaratne et al., 2014).

Immunization against HPV has shown a great value in prevention of cervical cancer in developing countries (Denny, 2012) as a primary prevention strategy. Therefore, health authorities of Sri Lanka have taken measures to include the HPV vaccine to the national immunization programme namely Expanded Programme of Immunization (EPI) making it compulsory for young females from the year 2017 (Jayarajah & Abeygunasekera, 2021; Tsu, 2021; Ushara et al 2020). However, it has been available in Sri Lanka since 2010 in the private sector (Jayarajah & Abeygunasekera, 2021). Secondary prevention of cervical cancer caused by HPV can be accomplished by increasing the coverage of women who are unscreened or screened infrequently (Hoste et al., 2013). Pap smear test is the main tool to detect cervical cancer in developed countries (Denny et al., 2006). Furthermore, strategies which are used to prevent sexually transmitted infections are also effective in preventing genital HPV infection (Lenehan et al., 2008). Well-organized pap smear test programmes are conducted in developed countries and as a result of this, the early stages of cervical cancer are identified and prevented up to 80% (Ushara et al., 2020). However, due to the lack of resources, conducting cervical cancer prevention cytological screening programmes in developing countries has faced difficulties (Ali et al., 2012).

Usually, young women who start sexual activities in early years are at risk of having cervical cancers due to HPV in later years of their lives (Ali et al., 2012; Ushara et al., 2020). Young women, specifically undergraduates are at risk of reproductive and sexual disorders, since they are in a distinct sub-culture, away from their homes and usually tend to start intimate relationships in this age (Yamarat, 2010). Compared to the other cancers, prevention and treatment alternatives that exist are cheaper and effective for cervical cancers

(Lenehan et al., 2008). Therefore, providing educational and preventative information to society is imperative for infection prevention and vaccination initiatives (Li et al., 2009; Olubodun et al., 2019).

However, access to these interventions which is a huge challenge for people living in low- and middle-income countries, might be related to the unawareness, limited access to health care and cultural reluctance for sexual health care (Lenehan et al., 2008). A few studies reported that there is a wide gap in the awareness about HPV and related diseases between most women living in developing and developed nations (Li et al., 2009; Olubodun et al., 2019). Further, in Sri Lanka, only a few studies have been done emphasizing lack of knowledge on HPV and cervical cancer among university students (Fasry et al., 2020; Jayawickrama & Rathnayake; Östh, 2015).

Universities being public institutions where the future of the country is being designed, they are the best places to assess the threats for future health issues of the nation. Therefore, assessing the knowledge on HPV and related problems among the university undergraduates is also worthwhile in order to provide reliable information to design interventions to prevent the crisis of HPV related health issues. Hence, the current study was conducted to assess the knowledge regarding HPV, related diseases, HPV vaccination and cytological screening of cervical cancer and preventive measures among female undergraduates of a selected University in Sri Lanka.

Methods

Study design, sampling and participants

A descriptive cross-sectional study was conducted at five faculties of University of Ruhuna (UoR), Sri Lanka with the participation of 400 female undergraduates selected using the One-stage cluster sampling. The selected clusters include five faculties (Medicine, Allied Health Sciences, Engineering, Management & Finance, Humanities & Social Sciences). Eighty undergraduates from each faculty were selected randomly using the student registration lists as the sampling frames. Approximately an equal number of female students who consented was recruited from each academic year.

The sample size was calculated assuming that 50% of female undergraduates have adequate knowledge on HPV and related areas using the formulae; $n = p\ (1\text{-}p) \times z^2/d^2$ (Lwanga & Lemeshow, 1991).

Study instrument and data collection

Data were collected using a, pre-tested, self-administered questionnaire consisting of 45 statements to assess the knowledge regarding HPV and related disease conditions, HPV vaccination, and cytological screening in a scale of “True”, “False” and “No idea”.

The questionnaire was developed by the investigators referring to existing literature and translated into Sinhala language. Content validity of the questionnaire was ensured by obtaining the feedback from two subject experts who are Obstetricians and Gynaecologists. The face validity of the

questionnaire was ensured with pre-testing with ten female undergraduates at the University of Sri Jayewardenepura, Sri Lanka. During the pre-test, feasibility, understanding, completeness, time taken and interpretation of questions in the questionnaire were evaluated. After the pre-test all the ambiguities such as understanding issues, spelling issues and wording issues in the questionnaire were eliminated.

The questionnaires were administered in Sinhala language among the selected undergraduates by meeting them at the university premises during their leisure times. Further, they were asked to complete it individually.

Statistical analysis

Data were presented by frequencies and percentages. Pearson's chi square/Fisher's exact test was done to assess associations between socio-demographic data and the knowledge scores. Data were analyzed with statistical package of social sciences (SPSS) version 25.0 and statistical significance was set at $p<0.05$.

In assessing knowledge, one point was given to a true answer and zero point was given to a false or no idea. Maximum score which could be achieved was 45 and minimum was 0. Knowledge score was divided in to three categories as poor (0 – 15), average (16 – 30), and good (31 – 45). This scoring and categorizations were established by the investigators as an in-house scoring system.

Ethical considerations

The ethical clearance for the study was obtained from the Ethics Review Committee of Faculty of Allied Health Sciences, UoR [Ref no: 30.05.2019:2.20]. Permission to collect data from each faculty were obtained from the relevant authorities before commencing data collection. Written informed consent was obtained from participants after providing all the information relevant to the study.

Results

Socio-demographic characteristics of the female undergraduates

Table 1 presents the sociodemographic characteristics of female undergraduates who participated in the study. Majority of them were in 21-23 years age (n=247, 61.8%).

Table 1. Socio-demographic characteristics of the of the female undergraduates (n=400)

Variable	Category	Frequency (%)
Age (years)	18-20	4 (1.0)
	21-23	243 (60.8)
	24-26	140 (35.0)
	27-30	13 (3.3)
Ethnicity	Sinhala	395 (98.8)
	Non- Sinhala	5 (1.2)
Religion	Buddhist	388 (97.0)
	Non-Buddhist	12 (3.0)
Academic year	First year	107 (26.8)
	Second year	106 (26.5)
	Third year	107 (26.8)
	Fourth/Final year *	80 (20.0)

* Both 4th and 5th year (final) students were included from the Faculty of Medicine.

Table 2. Knowledge regarding HPV and cervical cancer (N=400)

Statement	True n (%)	False n (%)	No idea n (%)
HPV infection is common worldwide.	179 (44.8)	16 (4.0)	205 (51.2)
HPV is transmitted by sexual intercourse	254 (63.5)	17 (4.3)	129 (32.3)
HPV is transmitted by needle sharing	90 (22.5)	68 (17.0)	242 (60.5)
HPV is transmitted by vaginal deliveries	138 (32.0)	54 (13.5)	218 (54.5)
HPV is transmitted by hand shaking.	33 (8.3)	157 (39.3)	210 (52.5)
HPV infection affects both males and females	152 (38.0)	90 (22.5)	158 (39.5)
HPV causes for cervical cancers	286 (71.5)	9 (2.3)	105 (26.3)
HPV causes for anal cancers	96 (24.0)	62 (15.5)	242 (60.5)
HPV causes for genital warts	166 (41.5)	27 (6.8)	207 (51.7)
HPV causes for urinary tract infections	78 (19.5)	60 (15.0)	262 (65.5)
HPV causes for bowel cancers	24 (6.0)	108 (27.0)	268 (67.0)
HPV causes for lung cancers	22 (5.5)	117 (29.3)	261 (65.3)
HPV causes for cancers in head and neck area	34 (8.5)	102 (25.5)	264 (66.0)
Most people with HPV do not experience any symptoms	152 (38.0)	27 (6.8)	221 (53.3)
People can transmit HPV to their partners even if they have no symptoms.	147 (36.8)	46 (11.5)	207 (51.7)
Use of vaccination is a preventive measure for HPV infection	275 (68.8)	14 (3.5)	111 (27.8)
Use of condoms is a preventive measure for HPV infection	151 (37.8)	50 (12.5)	199 (49.8)
Use of oral contraceptives is a preventive measure for HPV infection	42 (10.5)	133 (33.3)	225 (56.5)
Start sexual activities later in life is a preventive measure for HPV infection	56 (14.0)	89 (22.3)	255 (63.7)
Having less number of sexual partners is a preventive measure for HPV infection	114 (28.5)	56 (14.0)	230 (57.5)
Cervical carcinoma is one of the most common carcinomas among women.	289 (72.3)	9 (2.3)	102 (25.5)
Cervical carcinoma is preventable.	279 (69.8)	10 (2.5)	111 (27.8)
Cervical carcinoma is curable.	181 (45.3)	33 (8.3)	186 (46.5)

Table 3. Knowledge regarding HPV vaccination (N=400)

Statement	True n (%)	False n (%)	No idea n (%)
A vaccine is available for HPV.	253 (63.2)	16 (4.0)	131 (32.8)
The HPV vaccine prevents cervical cancer.	220 (55.0)	16 (4.0)	164 (41.0)
The HPV vaccine prevents genital warts.	120 (30.0)	42 (10.5)	238 (59.5)
The HPV vaccine can prevent all types of sexually transmitted diseases.	20 (5.0)	169 (42.5)	211 (52.8)
The HPV vaccine is available in Sri Lanka.	244 (61.0)	9 (2.3)	147 (36.8)
The HPV vaccination is included in the Expanded Programme of Immunization (EPI) schedule in Sri Lanka.	190 (47.5)	18 (4.5)	192 (48.0)
The HPV vaccine is available in the private sector.	178 (44.5)	24 (6.0)	198 (49.5)
The HPV vaccine is an inactivated one.	91 (22.8)	61 (15.3)	248 (62.0)
The HPV vaccine is recommended for grade 6 female school children in Sri Lanka.	177 (44.3)	33 (8.3)	190 (47.5)
The HPV vaccine is recommended for male students at grade 6 in Sri Lanka.	24 (6.0)	152 38.0)	224 (56.0)
The HPV vaccine can be taken by any woman who has never experienced any sexual activity.	180 (45.0)	20 (5.0)	200 (0.0)
The HPV vaccine is given in 2 doses in Sri Lankan EPI schedule.	123 (30.8)	19 (4.8)	258 (64.5)
2nd dose of the HPV vaccine should be given after 6 months of the 1st dose.	108 (27.0)	19 (4.8)	273 (68.3)
The HPV vaccine can be taken without doctor's recommendation at a private health institution	58 (14.5)	130 (32.5)	212 (53.0)

Knowledge regarding HPV, related diseases, its vaccination and cytological screening

Most of the female undergraduates were aware that HPV is transmitted by sexual intercourse (63.5%), HPV is a cause for cervical cancers (71.5%), use of vaccination is a preventive measure for HPV infection (68.8%), cervical carcinoma is one of the most common carcinomas among women (72.3%), cervical carcinoma is preventable (69.8%) (Table 2), vaccine is available for

HPV (63.2%), HPV vaccine prevents cervical carcinoma (61.0%) (Table 3), pap smear test is used as a cytological screening of cervical cancer (58.8%) and pap smear testing is available in Sri Lanka (60.0%) (Table 4).

Table 4. Knowledge regarding cytological screening (N=400)

Statement	True n (%)	False n (%)	No idea n (%)
Pap smear test is used as a cytological screening of cervical cancer.	329 (58.8)	11 (2.8)	154 (38.5)
Pap smear testing is available in Sri Lanka.	240 (60.0)	12 (3.0)	148 (37.0)
Pap smear test is done free of charge in the community health service in Sri Lanka.	171 (42.8)	21 (5.3)	208 (52.0)
Pap smear test should be done once in 5 years by every woman above 35 years in Sri Lanka.	177 (44.3)	11 (2.8)	212 (53.0)
Pap smear test is indicated only in women with vaginal bleeding.	22 (5.5)	176 (44.0)	202 (57.8)
Unmarried women cannot undergo in Pap smear test.	59 (14.8)	110 (27.5)	231 (57.8)
Pap smear test is not necessary after HPV vaccination.	31 (7.8)	131 (32.8)	238 (59.5)
Screening with Pap smear test; taking a sample of cells from the cervix for analysis to detect early stages of cervical cancer.	166 (41.5)	25 (6.3)	209 (52.3)

Level of knowledge and associated background information

The overall mean (SD) knowledge score was 18.49(11.97). Only one third of the study participants (38.3%, n=153) had good level of knowledge while 31.8% (n=127) had average and 30% (n=120) had poor level of knowledge.

Level of knowledge was associated with age ($p<0.001$), studying faculty ($p<0.001$) and academic year ($p<0.001$). Comparatively high proportion of female undergraduates aged 24-30 years, studying in the Faculty of Medicine and Allied Health Sciences in their final academic years had good level of knowledge compared to the other counterparts (Table 5).

Sources of information used by female undergraduates to acquire information on HPV

Information on HPV was acquired from social media 127(31.8%), from family members 23(5.8%), hospital 82(20.5%), general practitioners 67(16.8%) and friends

95(23.8%). Those who have obtained information from course materials and books were from Medicine and Allied Health Sciences Faculties 160(40%). Forty (10%) undergraduates had not even heard about HPV.

Table 5. Association between level of knowledge and socio-demographic information of undergraduates (n=400)

Variable	Sub groups	Level of knowledge			Chi value	P value
		Low	Moderate	Good		
Age	18-23 years	101 (40.9)	87 (35.2)	59 (23.9)	57.6	<0.001*
	24-30 years	26 (17.0)	33 (21.6)	94 (61.4)		
Faculty	Medicine	5 (6.3)	20 (25.0)	55 (68.8)	139.7**	<0.001**
	Allied Health Sciences	3 (3.8)	24 (30.0)	53 (66.3)		
	Engineering	37 (46.3)	28 (35.0)	15 (18.8)		
	Management and Finance	33 (41.3)	36 (45.0)	11 (13.8)		
	Humanities and Social Sciences	49 (61.3)	12 (15.0)	19 (23.8)		
Academic year	First	48 (44.9)	44 (41.1)	15 (14.0)	60.8	<0.001*
	Second	41 (38.7)	30 (28.3)	35 (33.0)		
	Third	20 (18.7)	35 (32.7)	52 (48.6)		
	Fourth/Final	18 (22.5)	11 (13.8)	51 (63.7)		

*Chi square test of independence, **Fisher's exact test

Discussion

This cross-sectional study found that only 38% of female undergraduates at UoR had good level of knowledge on HPV, related diseases, HPV vaccination and cytological screening of cervical cancer. There was a significant relationship between knowledge level and age, faculty of studying and academic year. It was observed that those who were studying in Medicine and Allied Health Sciences streams were more knowledgeable compared to the undergraduates from other faculties. Seeking information was very low among the undergraduates on the related context.

Studies using students with similar nature have found concordant findings (Bayramoğlu Tepe & Ozcorekci, 2020; Borlu et al., 2016; Fasry et al., 2020; Östh, 2015; Yam et al., 2017). A previous Sri Lankan study assessing knowledge among university undergraduates revealed limited knowledge on cervical cancer and HPV (Östh, 2015). The knowledge was higher among senior, Medical students similar to the findings of the current study, while knowledge was lower among students in the Management Faculty at Rajarata University of Sri Lanka (Östh, 2015). Further, a study done in the Eastern University of Sri Lanka

using the students of the Faculty of Arts & Culture reported that they have poor knowledge in all aspects of questions related to cervical cancer and its prevention (Fasry et al., 2020).

Having more knowledge among Medical and Allied Health Science undergraduates specially among nursing students has been found in studies conducted elsewhere (Bayramoğlu Tepe & Ozcorekci, 2020; Borlu et al., 2016; Yam et al., 2017). High level of awareness has shown a correlation with higher educational levels as well (Borlu et al., 2016).

In contrast to the current study findings, studies performed in Turkey revealed that university students mostly adopt the internet, television and print media as their source of information on sexual health (Bayramoğlu Tepe & Ozcorekci, 2020; Borlu et al., 2016). Further, a study from Greece that included young women of ages 17–24 reported that 69.7% had sufficient information regarding HPV and 95.9% knew about the vaccine (Michail et al., 2014).

It is not surprising to find poor level of knowledge and not having proper understanding regarding HPV and related problems in developing countries including Sri Lanka due to the lack of information delivered to young on HPV and related diseases (Hettiarachchi et al., 2013, Hettiarachchi, 2022). Further, societal discouragement of verbalizing sexual problems freely that undergraduates may impeded in seeking information on the above aspects (Hettiarachchi, 2022). However, it is expected that Medical and Nursing or Allied Health Sciences undergraduates having greater knowledge due to exposure to the clinical setting and medical knowledge within their course of study.

In many societies, young women specially the undergraduates depart from the family environment to start their university education. They leave the restricted family environment and expose to wider society to find new experience in sexuality with peers and have easier access to internet and television-based sources to gain information and increasing their health literacy (Hettiarachchi, 2022; Ivanova et al., 2020). Though knowledge seeking in these aspects are poor in the current study, only a few had attempted to get the information through a few sources such as social media and peers.

In Sri Lanka a campaign has been introduced and the public was educated on HPV, its consequences, HPV vaccine and cytological screening for the middle-aged women through public health education programs, TV broadcasts, newspaper reports or posters aimed at increasing HPV awareness (Gunasekara et al., 2019). However, this might not have been extended to the young especially directly to the school children and undergraduates. This would lead to many undergraduates being at risk of engaging in some unprotected sexual behaviors at the early ages, due to inadequate information regarding HPV. Therefore, educational programmes on HPV and cervical cancers could be promoted among women of younger ages in order to promote the knowledge on related context.

Limitations

This study was carried out in five faculties of a single university in Sri Lanka using

randomly selected undergraduates due to time constrains which may have affected generalizability of the findings. Data collection was carried out during a period of study leave and examinations in some of the faculties included may have affected the responses to the questionnaire.

Conclusions

The current study found only one third of the female undergraduates of UoR having a good level of knowledge on HPV, related diseases, HPV vaccination and cytological screening of cervical cancer. The level of knowledge was associated with age, faculty of studying and academic year. Those who follow the undergraduate programmes in Medical and Allied Health Sciences streams are more knowledgeable compared to the undergraduates from faculties other than health sciences. Information seeking was very low among the undergraduates on the related context.

The results emphasize the need for educational programmes on HPV to be provided at a young age. Apart from that, the enhancement of awareness among the undergraduates, specially, those who follow the non-health disciplines is also an important strategy.

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Conflict of interest

The authors declare that they have no conflict of interests.

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