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Knowledge, Attitudes and Practices towards Human Papilloma Virus among Females in Saudi Arabia

Ayman Khalid Johargy[1], Adil Jamal[2*] and Mohammed Ahmed Garout[3]

[1]Department of Medical Microbiology, Faculty of Medicine, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.
[2]Department of Nursing Sciences and Research, Faculty of Molecular Biology, College of Nursing, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.
[3]Department of Community Medicine and Public Health, Faculty of Medicine, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

Authors' contributions

This work was carried out in collaboration between all authors. Author AKJ designed and approved concept, supervision, funding and data Collection. Author AJ performed statistical analysis, literature search and manuscript preparation while sampling, administrative and technical support was monitored by author MAG. All authors read and approved the final manuscript.

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ABSTRACT

Background: Human Papilloma virus (HPV) (Cervical growth) has overall central dissemination and is observed second most elevated recurrence in females after breast malignancy in a decade ago among developing countries. The severity of disease is related to society attitude, practices and its knowledge.
Aim: The aim of our study was to evaluate and document the influence of Human papillomavirus on adolescent females about prevalent informations, knowledge, attitude and practices.
Place and Duration of Study: This cross sectional comparative study was conducted comprising 2675 participants from different colleges at Umm Al Qura University, Makkah, Saudi Arabia during January, 2015 to May, 2015.

**Corresponding author: Email: adiljamalcemb@gmail.com, adiljamaluqu1@gmail.com;*

Methods: A questionnaire was developed to collect information on knowledge and attitude of participants. The enrolled participants were solicited to answer the questions of questionnaire about HPV. HPV information assessment forms were used by examination of the related literature by the investigators. Univariate, bivariate and logistic regression were conducted with significance level at p<.05.

Results: The overall knowledge based attributes were answered wrong by participants showing a lack of knowledge about HPV regarding infection, transmission, prevention and vaccination while approximately half of attitude and practice best questions were scored correct by participants. Regarding knowledge among variables, marital status and colleges were found to be significantly correlated with HPV progression (χ^2=13.9; p=0.008), treatment (χ^2=8.3, p=0.001) respectively. Marital status showed significant association of good attitude with partner marriage (χ^2=14.4; p=0.006) and living (χ^2=17.4; p=0.008) together. Logistic regression with the whole sample found that previous knowledge about HPV, HPV infection without medical treatment, mode of transmission associated with participants augmented attitude towards HPV.

Conclusions: In our study, it was observed that adult female students who constituted our study group had lacking information and knowledge about HPV and infection. Verbal, written and visual communication tools and internet should be used intensively and efficiently for the objective of HPV knowledge and teaching the precautions related with prevention of cervix cancer in terms of society health. Primarily family physicians who offer service for the adult age group should be supported to develop appropriate attitudes and behaviors related with HPV knowledge, attitude and infection.

Keywords: Human papilloma virus; attitude; knowledge; infection; practices.

1. INTRODUCTION

Human Papilloma Virus (HPV) disease built up as a noteworthy etiological component in cervical growth [1]. HPV has turned out to be progressively critical as a pointer of atypical cervical cells and is presently being utilized as an essential sign spot for cervical disease in various clinics and hospitals. Although developments has been made in understanding the cellular system that change a normal cell into a malignant cells, our insight is a long way from complete and much stays to be found. To date, specialists have affirmed that specific genotypes of HPV called high-hazard sorts assume a part in the progression of cervical tumor; be that as it may, extra examinations are expected for more understanding of HPV disease and its role in cervical cancer worldwide. In Saudi Arabia, cervical tumor ranks eleventh among significant diseases in females, and ranks eighth for malignancy among females between the 15-44 ages [2].

High commonness of HPV has been accounted for particularly among youthful sexually dynamic people. Relentless disease with oncogenic HPV sorts, specifically HPV16, are causally identified with the improvement of anal and genital sores like Cervical Intra-epithelial Neoplasia (CIN), Vulvar Intraepithelial Neoplasia (VIN), Anal Intraepithelial Neoplasia (AIN) and additionally their consequent movement to obtrusive Squamous Cell Carcinoma (SCC). HPV disease is asymptomatic in majority of immunocompetent people, less males and females neglect to control viral contamination and create HPV-related malignancies [3-4]. Cervical malignancy is basic fourth most regular reason for death among tumors in females around the world [5].

The World Health Organization (WHO) has reported that 6.51 million females in Saudi Arabia aged 15 years and above established are at danger of creating cervical tumor. Current facts reveal that 152 females in Saudi Arabia are diagnosed with cervical growth and 55 die from the infection every year [5-6]. In acknowledgment of the worldwide pervasiveness, thorough exploration endeavors are progressing to combat malignancy and make this infection treatable.

Regarding cervical malignancies, lack of clinical knowledge, risk factors, primary and secondary prevention has been documented both in developed and developing countries [7-9]. However, few studies have been reported from Saudi Arabia [10]. Lack of knowledge about the HPV manifestations, causes and the required treatment in community could prompt the recession and its poor adherence. In addition, HPV vilifying group mentalities may adversely affect early determination and treatment. HPV knowledge and practices may play a critical role In empowering early finding and adherence to HPV control.

1.1 Objectives

The aim of this study was to assess awareness, knowledge of HPV infection, transmission and vaccination to assess attitude toward these among female students at Umm Al Qura University, Makkah, Saudi Arabia.

2. METHODS

2.1 Study Design and Period

This cross sectional study was conducted from January, 2015 to May, 2015 among different colleges of UQU, Makkah.

2.2 Study Population, Sample and Subjects

A total number of 2675 female students age ranging from 18-26 years participated in this study. Participants from Makkah (1809), Jeddah (459), Taif (251) and other cities (156) were selected by purposive random sampling. The undergraduate students belonging to different streams including medicine, applied medical, dental, history, physics, chemistry, Islamic faith, kindergarten, nursing and health administration, Arabic literature, Islamic law, and nursing colleges were included in the study.

2.3 Data Collection

Each participant filled the questionnaire under close supervision of the authors and research assistants who also explained to the students the purpose and procedure of the survey. The questionnaire excluded respondents' names to ensure their anonymity in the collected data.

2.4 Measure

Self-administered close ended questionnaire was developed by investigators, guided by study objectives and previously reported studies [7-9]. The "HPV knowledge form" and "HPV attitude and practices form" were designed by the investigators by examination of the related literature were utilized in the study. The questionnaire in English language was translated by autonomous bilingual interpreter into the real target dialect Arabic and was pre-tested in a sample of randomly picked participants from the study region who were not included in study. In the pre-test, the survey was evaluated for its understandability, clarity, completeness, reliability and socio cultural suitability. The "HPV knowledge form" comprised the questions containing the demographic properties of participants. HPV knowledge form was intended to accumulate the accompanying information from participants.

2.5 Variables and Measurements

2.5.1 Socio demographic variables (informations)

Demographic variables (independent /explanatory variables) like age, marital status, educational status and residency.

2.5.2 Dependent (Response) variables

2.5.2.1 HPV Source of information

Information on access to modern amenities such as mass media (television/radio, internet, poster, lecture, friends, books, magazines/newspapers, others).

2.5.2.2 HPV knowledge and awareness

Knowledge about infection, cervical cancer, vaccination, screening and sexual transmission infection (STI)

2.5.2.3 HPV attitude

Secondly, a questionnaire regarding "HPV attitude and practice form" which was administered and designed to gather the following data from participants:

- Attitude about intermittent (periodic) examination, vaccination, living and working together with HPV infected persons
- Attitude toward risks and dangers, PAP smear testing, community awareness for HPV

The primary arrangement for the review was to oversee the study instruments in university colleges female students.

2.6 Inclusion Criteria

University female students from 18-26 years age enrolled in various colleges of university.

2.7 Exclusion Criteria

Female students not willing to participate in this study. Students below 18 years.

2.8 Ethical Approval and Informed Consent

Informed consent was obtained from all the participants of the study after study details were disclosed to them. Informed consent was granted by signing of informed consent. The research project received ethical approval from the Research Ethics Committee, Faculty of Medicine, UQU. Participants were assured that information obtained from their respective colleges would be shared with them to enable them participate in a meaningful way in the intercession programs to be implemented thereafter.

2.9 Statistical Analysis

Respondents with missing information regarding various attributes were excluded from analysis. Data was analyzed using Microsoft Excel (ver 2010) Statistical Program for Social Sciences (SPSS ver 16.0 Chicago, USA). Descriptive analysis of all the explanatory and outcome variables was done by using mean and standard deviation for quantitative variables, frequency and percentages for categorical variables. Bivariate analysis was performed to analyze the relationship between the dependent variables. Chi square independence test was used for significant association between categorical (independent) variables and Student's t test was used for continuous (dependent) variables. P values < 0.05 were considered statistically significant. To verify the association between the variables studied among HPV knowledge and attitude, we used the odds ratio (OR) and its 95% confidence intervals (CIs), according to the univariate regression model, using the software SPSS, version 16.0.Logistic regression analysis was performed to determine the odds of HPV information, knowledge and attitude.

4. RESULTS

4.1 Sample Characteristics

The Sample of participants in this study included 2675 female students with age groups ranged between 18-20, 21-23, 24-26 years contributing 27% (722), 63.1% (1689) and 9.8% (264) congruently. Survey figured out 75.5% (2020), 20.6% (551) and 3.8% (104) proportions of un-married, married and divorced females respectively. 67.6% students belonged to Makkah followed by 17.2%, 9.4% and 5.7% from Jeddah, Taif and other cities respectively (Table 1). Approximately 90.5% (2421) female students participated in this study were other colleges while only 9.5% (254) were from medical college.

Table 1. Demographic variables of the study participants

Variable	N (%)
Age groups	
18-20	722 (27)
21-23	1689 (63.1)
24-26	264 (9.8)
Marital status	
Unmarried	2020 (75.5)
Married	551 (20.5)
Divorced	104 (3.8)
Educational status	
1st year	669 (25)
2nd year	751(28)
3rd year	578 (21.6)
4th year	481 (18)
5th year	94 (3.5)
6th year	102 (3.8)
Residence	
Makkah	1809 (67.6)
Jeddah	459 (17.2)
Taif	251 (9.4)
Other cities	156 (5.8)

N= number of participants, %= percentage

4.2 Sources of Information

The main source of information about HPV among UQU students was found internet (8.7%) followed by TV/ radio (4.5%) and lecture (4.1%) while poster or brochure and other sources were least reported sources of information (data not shown).

4.3 HPV Knowledge

A large number of students 2170 (81.1%) and 2203 (82.3%) in our study had no belief that HPV infects both gender and HPV infected patients are symptomatic respectively. Using a HPV knowledge index of 10 items of correct answers, 783 (29.3%) students included in the study answered right regarding HPV transmission mode in contrast to 1892 (70.7%) students reported wrong. 734 (27.4%) stated that cervical cancer and HPV risk increases because of multiple sex partners as that of 1941 (72.6%) students who marked it incorrect. 720 (26.9%) students avowed that PAP smear testing is effective tool in HPV screening against the 1955 (73%) students who considered it immoral. 648 (24.2%) marked true regarding vaccination that

vaccine is available that protects and reduces HPV infection and HPV related malignancies wile in contracts 2027 (75.7%) answered wrong. When the HPV infection and healing was considered, it was observed that 2362 (88.3%) students had no knowledge. When asked regarding the genital HPV most common STI, 2132 (79.7%) had no knowledge about HPV infection (Table 2). In index of 10 questions addressed about HPV knowledge significant proportion of students showed very poor rate of knowledge related to HPV infection, transmittance and its vaccination.

When the variables like age groups was studied it was reported that age groups of 21-23 years participants scored the maximum correct answer regarding questions addressed "most patients with HPV infection are symptomatic*",* "HPV plays a major role in cervical cancer development", "In most cases of HPV infection the virus heals and disappears without any medical treatment*"* followed by age group of 18-20 and 24-26 years. Educational status was analyzed for the above questions addressed, maximum correct answers were given by 1st year students followed by other academic years students enrolled in different colleges. When residency variable was analyzed, maximum correct answers regarding questions above addressed showed the highest proportion of participants from Makkah followed by Jeddah, Taif and other cities (Table 3).

Table 4 shows the relationship between marital status and HPV knowledge. Majority of the unmarried participants expressed significant correlation of HPV role in cervical cancer development. The proportion of the group that had knowledge regarding above questions addressed was greater in unmarried than in married and divorced (χ^2=13.9, p<0.05). Majority of unmarried female students also articulated statistically non-significant correlation of HPV infection clearance without any medical treatment, than those of married and divorced students (χ^2=7.9, p>0.05). Statistically non significant proportions among the unmarried, married and divorced female students regarding HPV infected patients symptomatic (χ^2=2.1, p>0.05), HPV transmission mode (χ^2=4.6, p>0.05) and STI (χ^2=7.7, p>0.05) showed that participants are unaware and had lack of knowledge regarding HPV. More among the medical college than other colleges, majority of participants from other colleges expressed significant relationship regarding HPV infected patients are symptomatic, HPV role in cervical cancer development and infection clearance without any medical treatment (χ^2=24.7, p<0.05; χ^2=8.3, p<0.05; χ^2=14, p<0.05 respectively) (Table 4). More participants among the other colleges than medical college are aware about HPV knowledge, infection and transmission aspects.

Table 2. HPV Knowledge and infection of study participants

Question addressed	HPV knowledge (+)	HPV knowledge (-)
	Participants responses N (%)	
1. HPV infects both gender.	505 (18.9)	2170 (81.1)
2. Most patients with HPV infection are symptomatic.	472 (17.6)	2203 (82.3)
3. HPV plays a major role in cervical cancer development.	658 (24.6)	2017 (75.4)
4. Having multiple sexual partners during lifetime increases the risk of developing HPV and cervical cancer.	734 (27.4)	1941 (72.6)
5. In most cases of HPV infection the virus heal and disappear without any medical treatment.	313 (11.7)	2362 (88.3)
6. Genital HPV is the most common sexually transmitted infection.	543 (20.3)	2132 (79.7)
7. There is a vaccine that protects and reduces the infection of HPV, cervical, vaginal and anal cancer.	648 (24.2)	2027 (75.7)
8. The pap smear test is an effective screening tool for cervical cancer.	720 (26.9)	1955 (73.0)
9. The most common mode of transmission of HPV is through sexual intercourse (STI).	783 (29.3)	1892 (70.7)
10. Infection of virus increase with people age above 40.	636 (23.8)	2039 (76.2)

Table 3. Demographic variables by whether respondents know about HPV infection

Variable	Question addressed			p-value
	Most patients with HPV infection are symptomatic	HPV plays a major role in cervical cancer development	In most cases of HPV infection the virus heals and disappears without any medical treatment	
Age groups	**N (%)**	**N (%)**	**N (%)**	$0.679^{n.s}$
18-20	122 (25.7)	178 (27)	83 (24.9)	
21-23	304 (64.2)	414 (62.9)	206 (66.2)	
24-26	46 (9.5)	66 (0.03)	24 (8.3)	
Educational status				$0.462^{n.s}$
1st year	141 (29.8)	197 (29.9)	108 (34.5)	
2nd year	109 (23.0)	156 (23.7)	85 (27.1)	
3rd year	104 (22.0)	149 (22.6)	65 (20.7)	
4th year	74 (15.6)	102 (15.5)	38 (12.1)	
5th year	26 (5.5)	25 (3.8)	8 (2.5)	
6th year	18 (3.8)	29 (4.4)	9 (2.8)	
Residence				$0.540^{n.s}$
Makkah	320 (67.9)	438 (66.5)	192 (61.3)	
Jeddah	90 (17.6)	106 (16.1)	70 (22.3)	
Taif	35 (7.7)	63 (9.5)	30 (9.5)	
Other cities	27 (6.7)	51 (7.7)	21 (6.7)	

N= number of participants, %= percentage, $^{**}p<0.01$; $^{*}p<0.05$; Non significant (n.s): $p>0.05$

4.4 HPV Attitude and Practices

When the attitude and practices in an index of 9 items addressed about HPV was examined, it was found that significant proportion of students in our study answered correctly. Proportion of 2023 (75.6%), 1659 (62%), 1633 (61%), 1619 (60%) and 1547 (57.8%) participants responded correctly regarding questions addressed Community awareness importance about HPV, pap smear testing, aware family regarding risk and dangers, periodic examination, and vaccination respectively (Table 5). 2303(86%), 2206 (82.4%), 1867 (69.7%) and 1834 (68.5%) participants answered wrong regarding HPV practices based questions addressed HPV infected person is immoral, Living with HPV infected male partner, work with HPV infected persons, and Agree to marry with HPV infected person respectively (Table 5). Overall participants in this study have awareness regarding attitude and practices regarding community awareness, family awareness, examination and vaccination to HPV.

Similar demographic variables were assessed for the HPV attitude and practices HPV infected person is immoral, Living with HPV infected male partner, work with HPV infected persons, and Agree to marry with HPV infected person. Age group 21-23 years and second year enrolled students from various colleges answered the maximum correct answers for the above addressed question followed by other age groups and succeeding academic years of different colleges (Table 6). Likewise, residency variable was measured for similar attitude and practice based addressed question like age groups and educational level, students belonging to Makkah scored the maximum correct answers regarding attitude and practice based questions followed by Jeddah, Taif and other cities (Table 6).

Association and statistically significance was measured between marital status, HPV attitude and practices. Majority of the unmarried and married participants expressed significant correlation of getting married and live together with HPV infected life partner (χ^2=14.4, $p<0.05$; χ^2=17.4, $p<0.05$ respectively). While statistically non significant and no association was observed among marital status regarding HPV infected person immoral, vaccination, working together with HPV infected persons (χ^2=2.9, $p>0.05$; χ^2=7.5, $p>0.05$; χ^2=6.6, $p>0.05$ respectively) (Table 7). Logistic regression relationship was studied for knowledge, infection and transmission of HPV. Among the participants included in this study, previous knowledge about HPV, infection clearance without any medical treatment, and HPV patients are symptomatic were remarkably associated with HPV knowledge index. While HPV role in cancer development and STI had no association in HPV knowledge index (Table 8). Logistic regression analyses showed some college education versus high school or less was

the only significant factor which influenced whether a participant had a good knowledge score of four or more correct answers.

The results of the logistic regression analysis revealed that the following significant predictors regarding HPV knowledge and infection were statistically significantly: previous knowledge about HPV (OR= 1.36; 95% CI 0.314), HPV viral infection clearance without medical treatment (OR= 1.40; 95% CI 0.342), mode of transmission (OR= 0.84; 95% CI -0.170). While HPV knowledge concerning: HPV infected patients are symptomatic, HPV role in cervical cancer development (OR = 0.88; 95% CI -0.124) and genital HPV most common sexually transmitted infection (OR = 1.11; 95% CI 0.110) were less knowledgeable (Table 8).

5. DISCUSSION

It is getting vital to raise awareness to cervical tumor in KSA. Level of learning and discernment are key components for receiving solid practices and enduring recently presented preventive measures. In KSA, despite the fact that there has been expanded thoughtfulness regarding community health programs, yet, majority of the accessible exploration has concentrated on breast malignancy, diabetes and obesity. In contrast, few reports with a limited sample size have been pursued to assess cervical tumor knowledge, and the recognition of HPV immunization among Saudis [11-12].

HPV is typical anal or vaginal sexually transmitted disease [13]. HPV is currently rooted cause for cervical and genital malignancies. Compelled open studies show HPV prevalence and predominance of cervical malignancies in Saudi Arabia [14]. Valuable HPV based information regarding incite un-necessary fear, absence of awareness and instability among young in Saudi Arabia is due to lack of limited school and university education programs about HPV disease. Previous studies support current findings about lack of information and also propose to raise knowledge and awareness about HPV [15-18].

Main source of information regarding HPV in current study coincide with previous findings reported in case of HPV vaccine uptake online surveys among young male and females [19]. To explain these findings, it can be deduce that importance of internet and mass media is obvious as means of maintaining information about HPV related problems. The media should implement new methods regarding HPV information and cervical malignancies in order to improve public information. Students of UQU had poor knowledge about HPV even less than half were not able to answers questions right. Current study findings are comparable with the results of previous studies [15].

In Saudi Arabia, due to the lack of a national screening program, most instances of cervical malignancies present at the complex stages and require broad treatment strategies with more disabilities and risks to individual health, [20-21] in addition to the burden on the health system and fabulous expenditure of health budget.

In general, subject specialty not influences HPV knowledge and informations. In current study because more number of participants from history college so maximum right answers scored by college of history as compare to Dentistry followed by Applied medical sciences and community college who scored minimum right answers due to less participants.

Based upon our attitude based attributes results strongly agree with previous findings [22]. Significant positive relationship among marital status, attitude and knowledge may be significant as knowledge is supposed to be enough in order to gain also more positive attitudes. Current study regarding HPV information, attitude and concerns illustrate poor knowledge and information about HPV based malignancies, vaccination efficiency and efficacy. Our findings are supported by previous findings [23-26].

Low level of awareness about HPV and cervical cancer in contrast to high level of attitude about periodic examination, vaccination, PAP smear testing, community awareness, risks and dangers shows a lack of information and infection related to HPV within community. It establishes a strong case for education awareness and other interventions in the community against HPV. Proposals for policymakers on the most proficient method to build learning, awareness and attitude of HPV may incorporate the accompanying: an extensive utilization of communication and social congregation to protect HPV to achieve entire populace; exploitation of health workers and volunteers for the provision of HPV data provision of information, training and communication materials for populaces and execution of community events on HPV knowledge among the public.

Table 4. Observed relationship of HPV knowledge and infection with marital category and student specialty

Question addressed	Marital status					Colleges			
	Unmarried N (%)	Married N (%)	Divorced N (%)	x^2	p value	Other colleges N (%)	Medical college N (%)	x^2	p value
Most patients with HPV infection are symptomatic	363 (18)	91 (16.5)	17 (16.3)	2.1	0.7 $^{n.s}$	399 (16.5)	73 (28.7)	24.7	0.00**
HPV plays a major role in cervical cancer development.	495 (24.5)	125 (22.7)	38 (36.6)	13.9	0.008**	577 (23.8)	81(31.9)	8.3	0.01*
In most cases of HPV infection the virus heal and disappear without any medical treatment.	230 (11.4)	63 (11.4)	20 (19.2)	7.9	0.09 $^{n.s}$	712 (29.4)	71 (28)	14	0.001**
Genital HPV is the most common sexually transmitted infection (STI).	399 (19.8)	116 (21.1)	28 (26.9)	7.7	0.1 $^{n.s}$	487 (20.1)	56 (22)	3.2	0.19$^{n.s}$
The most common mode of transmission of HPV is through sexual intercourse.	574 (28.4)	180 (32.7)	29 (27.9)	4.6	0.3 $^{n.s}$	715 (29.5)	68 (27)	0.6	0.42 $^{n.s}$

$^{**}p<0.01$; $^{*}p<0.05$; Non significant (n.s): $p>0.05$; x^2: Chi square

Table 5. HPV attitude and practice of study participants

Question addressed	HPV Attitude (+)	HPV Attitude (-)
What would you do if you know person HPV infected?	**Participants responses N (%)**	
1. HPV infected person is immoral.	372 (13.9)	2303 (86.0)
2. Periodic exam that help in early detection of HPV and cervical cancer.	1633 (61)	1042 (38.9)
3. Vaccination to prevent cervical cancer in future.	1547 (57.8)	1128 (42.1)
4. Agree to marry with HPV infected person.	841 (31.4)	1834 (68.5)
5. Living with HPV infected male partner.	469 (17.5)	2206 (82.4)
6. Live and work with HPV infected persons.	808 (30.2)	1867 (69.7)
7.Should PAP smear testing to a part of routine percentage testing	1659 (62)	1016 (37.9)
8.Will you educate your family about the risk and dangers of HPV	1619 (60)	1056 (39.4)
9.Community awareness importance about HPV	2023 (75.6)	652 (24.3)

Table 6. Demographic variables by respondents about HPV attitude

Variable	Question addressed					p value
	HPV infected person is immoral	Vaccination to prevent cervical cancer in future	Agree to marry with HPV infected person	Living with HPV infected life partner	Live and work with HPV infected persons	
Age groups	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	0.0268*
18-20	104 (27.9)	417 (26.9)	145 (0.9)	234 (28.5)	224 (26.6)	
21-23	232 (62.3)	959 (61.9)	287 (61)	494 (16.1)	531 (62.9)	
24-26	36 (9.6)	171 (11)	37 (7.8)	80 (9.9)	88 (10.4)	
Educational status						0.041*
1st year	122 (32.7)	178 (22)	377 (24.3)	105 (22.3)	180 (21.4)	
2nd year	90 (24.1)	248 (30.6)	400 (25.8)	157 (33.4)	246 (29.2)	
3rd year	75 (20.1)	186 (23)	354 (18.2)	112 (23.8)	191 (22.7)	
4th year	55 (14.7)	133 (16.4)	282 (4.3)	63 (13.4)	154 (18.3)	
5th year	15 (4.03)	30 (3.7)	67 (4.3)	18 (3.8)	32 (3.8)	
6th year	15 (4.03)	33 (4.08)	67 (4.3)	14 (2.9)	38 (4.5)	
Residence						0.207 n.s
Makkah	253 (68)	1058 (68.3)	300 (63.9)	559 (69.1)	574 (68.2)	
Jeddah	76 (20.4)	241 (15.5)	79 (16.8)	112 (13.8)	134 (15.9)	
Taif	31 (8.3)	157 (10.1)	77 (16.4)	103 (12.7)	95 (11.3)	
Other cities	12 (3.2)	91 (5.8)	13 (2.7)	34 (4.2)	38 (4.5)	

***p<0.01; *p<0.05; Non significant (n.s): p>0.05*

Table 7. Observed relationship of HPV attitude with marital category

Question addressed	Unmarried	Married	Divorced	χ^2	p value
What would you do if you know person HPV infected?	**N (%)**	**N (%)**	**N (%)**		
HPV infected person is immoral.	820 (40.7)	76 (13.8)	18 (17.3)	2.9	0.5 n.s
Vaccination to prevent cervical cancer in future.	1167 (57.4)	311 (56.4)	69 (66.3)	7.5	0.2 n.s
Agree to marry with HPV infected person.	323 (16)	123 (22.3)	23 (22.1)	14.4	0.006**
Living with HPV infected male partner.	576 (28.5)	201 (35.5)	31 (29.8)	17.4	0.008**
Live and work with HPV infected persons.	614 (30)	196 (35.6)	31 (29.3)	6.6	0.1 n.s

***p<0.01; *p<0.05; Non significant (n.s): p>0.05; χ^2: Chi square*

Table 8. HPV Knowledge, infection and attitude logistic relationship

Question addressed	OR	p	S.E	95% CI
Do you have previous knowledge about HPV	1.36	0.009**	0.120	0.314
Most patients with HPV infection are a symptomatic	1.11	0.036 n.s	0.084	0.176
The HPV plays a major role in cervical cancer development	0.88	0.119 n.s	0.079	-0.124
In most cases of HPV infection the virus heal and disappear without any medical treatment	1.40	0.001**	0.091	0.342
Genital HPV is the most common sexually transmitted infection (STI)	1.11	0.20 n.s	0.087	0.110
The most common mode of transmission of HPV is through sexual intercourse	0.84	0.025*	0.076	-0.170

OR= Odds Ratio, S.E= standard error, CI= confidence interval
***p<0.01; *p<0.05; Non significant: p>0.05*

6. STUDY LIMITATIONS

This study has a few impediments. This study was pilot, so easygoing conclusions couldn't be drawn. Another restriction of study was that data gathered in the study was based upon arrays in variables like diverse age groups, colleges, educational status and residency.

7. CONCLUSION

This study indicates a poor level of knowledge of cervical cancer and misinformation regarding primary and secondary preventive measures among Saudi female students enrolled in different colleges at UQU, Makkah, Saudi Arabia. Majority of UQU students participated in study showed negative attitude towards HPV infected persons. Therefore it is recommended that more appropriate education programs should be initiated to create more awareness about HPV knowledge. This can be achieved by organizing public lectures, designing brochures containing general information about HPV and cervical malignancies. Government should initiate vaccination program. In addition, we recommend mass media such as TV, radio and newspaper to increase the awareness among people towards HPV related infection and malignancies.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Münger K, Baldwin A, Edwards KM, Hayakawa H, Nguyen CL, Owens M, Grace M, Huh K. Mechanisms of human papilloma virus-induced oncogenesis. J Virol. 2004;78:11451-11460.
2. CSR, Cancer Incidence and Survival Report: Saudi Arabia. Saudi Cancer Registry. Riaydh, Saudi Arabia; 2007.
3. Walboomers JM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV, Snijders PJ, Peto J, Meijer CJ, Muñoz N. Human papilloma virus is a necessary cause of invasive cervical cancer worldwide. J Pathol. 1999;189(1):12-9.
4. Castellsagué X, Bosch FX, Muñoz N. Environmental co-factors in HPV carcinogenesis. Virus Res. 2002;89(2): 191-9.
5. World Health Organization, World Cancer Report, Chapter 5.12. Regional Office for South-East Asia. 2014;630.
6. World Health Organization (WHO) and Institute Català d'Oncologia (ICO). WHO/ICO Information Centre on HPV and Cervical Cancer; 2009.
Available: http://www.who.int/hpvcentre/en/
7. Kietpeerakool C, Phianmongkhol Y, Jitvatcharanun K, Siriratwatakul U, Srisomboon J. Knowledge, awareness and attitudes of female sex workers toward HPV infection, cervical cancer, and cervical smears in Thailand. Int J Gynecol Obstet. 2009;107:216-9.
8. Notara V, Soultatou P, Tselika A. Lay knowledge of HPV infection and the vaccine against HPV in Greece. Health Science Journal. 2012;6:270-279.
9. Kamzol W, Jaglarz K, Tomaszewski KA, Puskulluoglu M, Krzysztof K. Assessment of knowledge about cervical cancer and its prevention among female students aged 17–26 years. Eur J Obstet Gynecol Reprod Biol. 2013;166:196-203.
10. Ghadeer K. Al-Shaikh, Eman M. Almussaed, Amel A. Fayed, Farida H. Khan, Sadiqa B. Syed, Tahani N. Al-Tamimi, Hala N. Elmorshedy. Knowledge of Saudi female university students regarding cervical cancer and acceptance of the human papilloma virus vaccine. Saudi Med J. 2014;35(10):1223-30.
11. Al-Darwish AA, Al-Naim AF, Al-Mulhim KS, Al-Otaibi NK, Morsi MS, Aleem AM. Knowledge about Cervical Cancer Early Warning Signs and Symptoms, Risk Factors and Vaccination among Students at a Medical School in Al-Ahsa, Kingdom of Saudi Arabia. Asian Pac J Cancer Prev 2014;15:2529-2532.
12. Sait KH. Knowledge, attitudes and practices regarding cervical cancer screening among physicians in the Western Region of Saudi Arabia. Saudi Med J. 2011;32:1155-1160.

13. Hariri S, Eileen Dunne, Mona Saraiya, Elizabeth Unger, Lauri Markowitz. Human Papilloma virus (HPV). Manual for the Surveillance of Vaccine-Preventable Diseases. Vaccines and Immunizations. Centers for Disease Control and Prevention (CDC), Atlanta, GA; 2008.
14. Alsbeih G. HPV Infection in Cervical and Other Cancers in Saudi Arabia: Implication for Prevention and Vaccination. Front Oncol. 2014;4:65.
15. Charlotte Devereaux Walsh, Aradhana Gera, Meeraj Shah, Amit Sharma, Judy E Powell, Sue Wilson. Public knowledge and attitudes towards Human Papilloma Virus (HPV) vaccination. BMC Public Health. 2008,8:368.
16. Elit L, K Trim, R Mohan, S Nastos and D Harnish. The knowledge and attitudes of University students concerning HPV vaccine and cervical screening. Clinical Medicine Insights: Reproductive Health 2009;3:1-8.
17. Kristina Trim, Naushin Nagji, Laurie Elit, and Katherine Roy. Parental Knowledge, Attitudes Behaviours towards Human Papillomavirus Vaccination for Their Children: A Systematic Review from 2001 to 2011. Obstetrics and Gynecology International. 2012;12. Article ID 921236.
18. Mohammed Danya, Alissar Chidiaca, Anwar H. Nassar. Human papilloma virus vaccination: Assessing knowledge, attitudes, and intentions of college female students in Lebanon, a developing country. Vaccine. 2015;33(8):1001-1007.
19. Nelson EJ, Hughes J, Oakes JM, Pankow JS, Kulasingam SL. Estimation of Geographic Variation in Human Papillomavirus Vaccine Uptake in Men and Women: An Online Survey Using Facebook Recruitment. J Med Internet Res 2014;16(9):198.
20. el Dosoky M, Ismail N, Dagastani M. Preinvasive cervical carcinoma in Saudi Arabia. Lancet. 1995;345:650.
21. Manji M. Cervical cancer screening program in Saudi Arabia: Action is overdue. Ann Saudi Med 2000;20:355-357.
22. Mitchell AW, Ely G. A pilot study of knowledge and attitudes toward HPV and HPV vaccine in an Appalachian Kentucky county; 2008.
Available:http://www.uky.edu/programs/CREEK/Papers.html
23. Al-Dubai SA, Alshagga MA, Al-Naggar RA, Al-Jashamy K, Baobaid MF, Tuang CP, Abd Kadir SY. Knowledge, attitudes and barriers for human papilloma virus (HPV) vaccines among Malaysian women. Asian Pac J Cancer Prev. 2010;11(4):887-92.
24. Chekuri A, Bassaw B, Affan AM, Habet G, Mungrue K. Knowledge, attitudes, practice on human papilloma virus and cervical cancer among Trinidadian women. J Obstet Gynaecol. 2012;32(7):691-4.
25. Wong MC, Lee A, Ngai KL, Chor JC, Chan PK. Knowledge, attitude, practice and barriers on vaccination against human papillomavirus infection: a cross-sectional study among primary care physicians in Hong Kong. PLoS One. 2013;8(8):71827.
26. Fernández ME, Yen-Chi L. Le, Natalie Fernández-Espada, William A. Calo, Lara S. Savas, Camille Vélez, Angela Pattatucci Aragon, Vivian Colón-López. Knowledge, attitudes, and beliefs about human Papillomavirus (HPV) vaccination among Puerto Rican mothers and daughters, 2010: A Qualitative Study. Prev Chronic Dis. 2014;11:140171.

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