

RESEARCH ARTICLE

Editorial Process: Submission:06/07/2017 Acceptance:06/08/2018

Knowledge and Perception Towards Cervical Cancer among Female Debre Berhan University Students

Kalayu Birhane Mruts*, Tesfay Birhane Gebremariam

Abstract

Background: Cervical cancer is a global public health problem with around five hundred thirty thousand new cases and two hundred sixty five thousand deaths annually in 2015. Risky behaviors, lack of knowledge and preventative measures in young women, increase the risks of cervical cancer later in life. Up to date, there is scarcity of study on level of knowledge and perception towards cervical cancer among young women in Ethiopia. So, this study was aimed to determine the level of knowledge and perception toward cervical cancer among female regular undergraduate Debre Berhan University students. **Methods:** A facility based cross-sectional study was conducted using self-administered questionnaire among female regular DBU students from May to June, 2015. Two stage cluster sampling technique was used for the study. Data was entered and cleaned in Epi info and imported to SPSS for analysis. Binary logistic regression was carried out to determine factors of good knowledge on cervical cancer. P-value less than 0.05 was considered for statistical significance. **Results:** Eighty-four (14.5%) of the study participants were sexually active. Of the participants, 232(40.5%) had heard of cervical cancer but only 195 (35.6%) had good knowledge towards cervical cancer and of the study participants, only 185 (33.2%) perceived as they are susceptible for cervical cancer. Using radio and TV as source of information [AOR= 1.918 (95% CI: 1.223, 3.010)], having information about sexually transmitted infections (STI) [AOR=3.030 (95% CI: 1.665, 5.514)] were significantly and independently associated with good knowledge on cervical cancer. **Conclusions:** The level of knowledge towards cervical cancer and perception of acquiring the disease was poor. Health education interventions are needed to improve the awareness and health seeking behavior in youth women thereby preventing cervical cancer related morbidity and mortality.

Keywords: Cervical cancer- knowledge- perception- Debre Berhan- Ethiopia

Asian Pac J Cancer Prev, **19** (7), 1771-1777

Introduction

Cervical cancer is a global public health problem with 527,624 new cases and 265,653 deaths annually, accounting for 9% of female cancer deaths (ICO Information Centre on HPV and cancer, 2015). Eighty three percent of new cases and more than 85% of related deaths are in low and middle income countries (World Health Organization, 2013). Eastern Africa has a higher proportion of cervical cancer burden than other regions in Africa and an HPV prevalence of 35.4 percent of women ≥ 15 (Rates, 2009). Ethiopia has a population of 27.19 million women aged 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 7,095 women are diagnosed with cervical cancer and 4732 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Ethiopia and Cervical cancer is the 2nd leading cause of cancer deaths in women aged 15 to 44 years in Ethiopia (Bruni et al., 2016). Cervical cancer is preventable and, in most cases, curable, if identified in its early stages. Knowledge about early signs and symptoms

is crucial for early diagnosis and treatment. Though preventable and curable, most women in developing countries including Ethiopia presents at an advanced stage that requires extensive treatment modalities like surgery, radiotherapy, chemotherapy and has markedly diminishes chance of success (Roy et al., 2011).

A study in Nigeria, Abiodun et al., (2013) showed that only 2.3% of the women could identify a virus as the cause of cervical cancer while 4.1% identified cervical screening as a way to prevent cervical cancer. Another study conducted in South Africa among female university students indicated that 15.6% did not know any risk factors for cervical cancer, 58.6% of 164 students who knew of risk factors, did not know that cervical cancer is preventable. The Pap smear test used for detection or prevention of cervical cancer, was known to only 38% of the respondents (Hoque and Hoque, 2009). The results of studies indicated that female university students, are at a higher risk of STIs associated with cervical cancer such as Human Papilloma Virus (HPV) infections because of multiple lifetime sex partners and pass through education institutions without getting adequate knowledge

Department of Public Health, Debre Berhan University, Debre Berhan, Ethiopia. *For Correspondence: kalayu2002@gmail.com

about cervical cancer (Shin Hai-Rim et al., 2004; Stuart Weinstock et al., 2000). In contrast to developing countries, experience in developed countries has shown that healthy lifestyles, such as health information and warnings about tobacco use, sexuality education tailored to age & culture, condom promotion/provision for those engaged in sexual activity, vaccination against HPV and well planned, organized screening programs with high coverage can significantly reduce the number of new cases of cervical cancer and the mortality rate associated with it (World Health Organization, 2013). Most studies conducted in Nigeria, Ethiopia, Bhutan and Maldives among women of reproductive age groups indicated that the level of knowledge and perception about cervical cancer was very low (Basu et al., 2014; Dhendup and Tshering, 2014; Envaladu et al., 2013; Getahun et al., 2013). But studies regarding knowledge and perception of cervical cancer among young women in Ethiopia are very limited.

So, this study aimed to determine the level of knowledge on sign and symptoms, risk factors and the preventive measures of cervical cancer and its associated factors among female undergraduate students. Findings of this study could help to provide evidenced information to health authorities and other stakeholders in order to design interventions that can reduce the incidence and mortality of cervical cancer.

Materials and Methods

Study design and setting

A cross-sectional study was conducted from May to June, 2015 among regular undergraduate female DBU students. The university is found in Debre Berhan town which is 130 kilometers from Addis Ababa. According to 2015 registrar office report, the university has approximately 20,000 students pursuing regular and extension undergraduate and graduate studies. Of this 10,560 are regular undergraduate students. Official university statistics show that 37.5% of the students are females and most of the undergraduate students living in university residential halls during the semester sessions. The University has two Institutes, eight colleges and 33 departments.

Sampling size calculation

The 584 sample size was calculated using single population proportion by open epi software considering the following assumptions; the number of female regular undergraduate students in the university=3,962, proportion of the university students who had knowledge on risk factors of cervical cancer=50.6% (Isa Ibrahim Ayuba, 2013), 95% confidence interval, 5% reliability, 1.5 design effect and 10% non-response rate.

Sampling procedure

Two stage cluster sampling technique was used for the study. In the first stage, of the twenty-nine departments, nine departments were selected by using simple random sampling technique and the sample size was allocated proportionally to each selected departments, based on

the number of students. In the second stage, the study participants were selected from each year of study and sections of the selected departments by simple random sampling technique using computer method proportionally to the number of students in each year of study and sections. A list of the students was obtained from each department.

Data collection procedure

A self-administered questionnaire containing open and closed ended questions was prepared initially in English after reviewing deferent literature then translated into Amharic (local language) by an expert and again retranslated to English. Before the actual data collection process, the tool was pre tested on 27 female Public Health students of Debre Berhan University. Then necessary modifications were made according to the results of pretest study. Six data collectors were recruited to facilitate the data collection process and were trained for two days. During the data collection process, the data facilitators introduces themselves to the participants and handed over a letter from each college/department which asked for support of the data collection process and showed the ethical clearance.

Measurement

Participant's knowledge about cervical cancer was assessed by using a 20 points scale questions about the etiology, mode of transmission, symptoms, risk factors and prevention methods. A knowledge score was calculated for each participant based on the number of questions correctly answered in the knowledge section. A score of 1 was assigned to every correct answer and a score of zero to incorrect responses. Knowledge questions was scored and pulled together and the mean score was computed to determine the overall knowledge of the participants. Participants scored above the mean were considered as having good knowledge and below average as having poor knowledge.

Perception about cervical cancer and screening was assessed using the constructs of health belief model; perceived susceptibility, perceived severity, perceived benefits and perceived barriers.

Statistical analysis

Data was entered into an Epi info 3.5.4 and imported to SPSS version 20 for analysis. Results were summarized using descriptive summary measures for continuous variables, frequency and percent for categorical variables. To identify the effect of independent variables on knowledge of cervical cancer, both the univariate and the multivariate logistic regression analysis were used. Variables with p value < 0.2 in the bivariate analysis was included in the multiple logistic regressions. Odds ratio and 95% confidence interval was used to identify the presence and strength of association and level of significance at the 0.05.

Ethical considerations

Ethical clearance was obtained from research and community service Directorate of Debre Berhan University. Permission for conducting the study was

obtained from each college and departments. Information sheet that contains about the benefit and risk of participating of the respondents in this study with written informed consent was attached to each questionnaire to brief each study participant.

Results

Sociodemographic characteristics of female DBU students

A total of 578 participants out of 584 were included in the study giving response rate of 98.97%. The participant's age was between the range of 17 and 38 years with mean age (\pm SD) of 20.45 \pm 1.79 and the highest number between 20 and 24 years. More than half (62.5%) of the participants come from rural area. Of the participants, 90.5% and 94.9% were orthodox by religion and single by marital status, respectively. Regarding to the field of study 36% were from Business and Economics College and 39.4% from Natural and Computational Science. Nearly half (46%) were from first year students. The main sources of information used by the participants were internet in 36.5% and radio and TV in 21.9 % (Table 1).

Reproductive History of female DBU students

Among all the study participants, 84 (14.5%) and among the single study participants, 55 (10.1%) were sexuality active at the time of this study with the mean age of the first sexual debut 18.21 \pm 2.8 years.

Table 1. Socio-demographic Characteristics of Female DBU Students

Variables	Frequency	Percent
Age group (n=573)		
<20	131	22.9
20-24	430	75
\geq 25	12	2.1
Marital status (n=571)		
Single	542	94.9
Married	23	4
Divorced	6	1.1
Religion (n=578)		
Orthodox	523	90.5
Others *	55	9.5
Residence (n=571)		
Rural	357	62.5
Urban	214	37.5
Year of study (n=578)		
First year	266	46
Second year	173	30
Third year	139	24
Monthly pocket money (n=538)		
<200	156	29
200-400	243	45.2
\geq 401	139	25.8

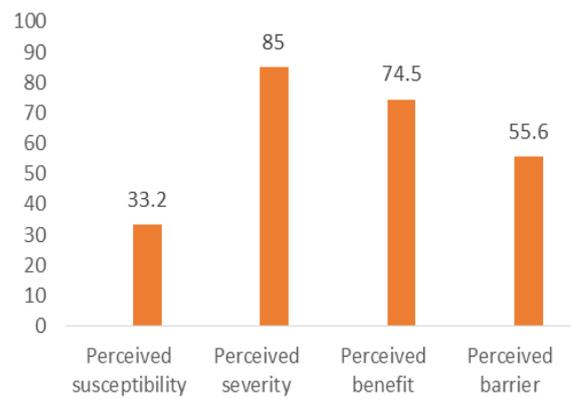


Figure 1. Perception Towards Cervical Cancer and Screening among Female Regular DBU Students

Of the participants who had started sexual intercourse, 77 (91.7%) had one partner. Among the sexually active participants 15 (17.9%) had history of pregnancy. Moreover, 453 (81.2%) of the participants had heard about STIs and 28 (5%) had history of STI. Eight (1.4%) of participants had family death from cancer.

Knowledge of female Debre Berhan University students towards cervical cancer

Two hundred thirty-two (40.5%) of the study participants had heard of cervical cancer. The main sources of information about cervical cancer were, 134 (58%) mass media followed by 44 (19.0%) health institutions. About 448 (79.4%), 348 (61.5%) and 379 (67.1%) of the participants did not know the etiology, mode of transmission and the symptoms of cervical cancer respectively but only 66 (11.7%) and 163 (28.8%) of the participants knew as cervical cancer is caused by HPV and transmitted by sexual intercourse respectively. Similarly, only 172 (30.4%) and 74 (13.1%) of the participants knew multiple partners and early sexual debut as risk factor of cervical cancer respectively. Furthermore, 215 (38.1%), 117 (20.7%) and 110 (19.5%) of the participants knew screening, vaccination and avoiding having many partners as prevention methods of cervical cancer. However, 213 (37.7%) and 89 (16%) of the participants did not know any risk factors and prevention methods of cervical cancer respectively. Generally, 195 (35.6%) of the participants had good knowledge towards cervical cancer (Table 2).

Factors associated with good knowledge of cervical cancer among of female DBU students

All sociodemographic characteristics, reproductive history and sources of information were assessed for the presence of association with knowledge of cervical cancer. Age, College, marital status, year of study, use of TV, use of radio and TV, starting sexual intercourse, information on STI and history of STI were shown an association in bivariate analysis. But after adjusting for confounding at multivariable analysis, using radio and TV as a source of information and information on STI were the predictor factors that remained significantly associated with knowledge of cervical cancer. Participants who were using radio and TV as source of information were

Table 2. Knowledge of Female DBU Students Towards Cervical Cancer

Variables	Frequency	Percent
Information on CC (n=573)		
Ever heard	232	40.5
Never heard	341	59.5
Etiology of cervical cancer		
HIV	17	3.0
HPV	66	11.7
Genetics	28	5.0
Do not know	448	79.4
Mode of transmission(n=566)		
Mother to child	18	3.2
Family history	9	1.6
Sexual intercourse	163	28.8
Could not transmitted	31	5.5
Do not know	348	61.5
Symptoms of cervical cancer		
Foul vaginal discharge	116	20.5
Pain during sexual intercourse	77	13.6
Bleeding during or after sexual intercourse	61	10.8
Post-menopausal bleeding	35	6.2
Intermenstrual bleeding	24	4.2
Itching	82	14.5
Do not know	379	67.1
Risk factors of cervical cancer		
Having many partners	172	30.4
Early sexual debut	74	13.1
Husband's Polygamy	30	5.3
HIV and other STIs	67	11.9
Tobacco	27	4.8
Long time use of pills	41	7.3
Multiparty	8	1.4
Do not know	213	37.7
Prevention methods		
Could not prevent	12	2.1
Screening	215	38.1
Vaccination	117	20.7
Delay early sexual debut	57	10.1
Avoid having multiple partner	110	19.5
Limit number of children	11	2
Avoid tobacco	28	5
Do not know	89	16
Knowledge score(n=548)		
Good	195	35.6
Poor	353	64.4

CC, Cervical cancer

almost 2 times more likely to have good knowledge on cervical cancer as compared to those who did not use radio and TV [AOR 1.918 (95% CI 1.223, 3.010)]. Moreover, participants who have heard about STI were also 3 times more likely to have good knowledge than their counter parts [AOR 3.030 (95% CI 1.665, 5.514)] (Table 3).

Perception of female DBU students towards cervical cancer and screening

Students' perception about cervical cancer and its screening was assessed using the perception pillars of health belief model. Accordingly, 185 (33.2%) of the participants were believed that the chance of acquiring

Table 3. Factors Associated with Knowledge of Cervical Cancer among Female DBU Students

Variables	Category	Knowledge on cervical cancer		AOR(95%CI)
		Good	Poor	
Age	< 20	38 (19.7)	85 (24.3)	1
	20-24	149 (77.2)	259 (74.0)	1.072 (0.638 - 1.802)
	≥ 25	6 (3.1)	6 (1.7)	1.487 (0.346 - 6.394)
College	BE	64 (32.8)	134 (38.0)	1
	Agriculture	14 (7.2)	26 (7.4)	1.110 (0.508 - 2.425)
	SSH	18 (9.2)	39 (11.0)	0.939 (0.477 - 1.849)
	Engineering	12 (6.2)	24 (6.8)	1.054 (0.464 - 2.396)
	NCS	87 (44.6)	130 (36.8)	1.459 (0.939 - 2.268)
Marital status	Single	181 (93.8)	333 (95.4)	1
	Married	8 (4.1)	14 (4.0)	0.785 (0.244 - 2.527)
	Divorced	4 (2.1)	2 (0.6)	1.911 (0.265- 13.764)
Year of study	Year one	81 (41.5)	172 (48.7)	1
	Year two	68 (34.9)	93 (26.3)	1.147 (0.709 - 1.857)
	Year three	46 (23.6)	88 (24.9)	0.834 (0.492 - 1.415)
TV	Yes	14 (7.2)	15 (4.3)	1.926 (0.836- 4.441)
	No	181 (92.8)	335 (95.7)	1
Radio and TV	Yes	57 (29.2)	63 (18.0)	1.918 (1.223 - 3.010)
	No	138 (70.8)	287 (82.0)	1
Sexual intercourse	Yes	35 (17.9)	47 (13.3)	0.978 (0.455- 2.104)
	No	160 (82.1)	306 (86.7)	1
Information of STI	Yes	174 (90.6)	264 (76.4)	3.030 (1.665 - 5.514)
	No	18 (9.4)	80 (23.3)	1
History of STI	Yes	14 (7.3)	13 (3.8)	2.270 (0.782 - 6.593)
	No	178 (92.7)	331 (96.2)	1

N.B: BE; Business and Economics, SSH; Social Science and Humanities, NCS; Natural and Computational Science

cervical cancer is high and 474 (85%) of the participants perceived as cervical cancer is a severe disease while 369 (65.2%) believed as cervical cancer is curable disease. despite three quarter (74.5%) of the participants believed that cervical screening can prevent cervical cancer only 5 (0.9%) were screened for cervical cancer. The main reasons cited for not screening were lack of information in 276 (55.6%) and fear not to be infected in 96 (19.4%) respectively (Figure 1).

Discussion

A cross-sectional study was carried out among female undergraduate DBU students in Ethiopia. The purpose was to assess the knowledge and perception of cervical cancer and to identify factors associated knowledge of cervical cancer among female students. The result of this study show that only few participants were sexually active. Moreover, majority of the sexually active participants had only one partner. Due to this more than half of the participants did not use condom during their sexual intercourses. This is lower than studies conducted in Nigeria (Ayinde et al., 2004; Envuladu et al., 2013) and in South Africa (Hoque, 2010). Furthermore, 81.2% of the participants had heard about STI and only 5% had history of STI.

In this study, only 40.5% of the participants had

heard about cervical cancer. This is consistent with the study conducted in South Africa (Hoque and Hoque, 2009) which is 42.9% but lower than studies carried out among female undergraduate university students in Jos and Ibadan, in Nigeria (Ayinde et al., 2004; Envuladu et al., 2013) and Uganda (Muliira et al., 2011) and among women of reproductive age groups in Ethiopia, Yemen and India (Abdul-Aziz et al., 2012; Bansal Agam et al., 2015; Getahun et al, 2013). The result is higher when compared with similar study conducted in South Africa (Hoque et al., 2010). The study in South Africa was only among first year university students. Being freshman university student might lack information on cervical cancer. The main source of information for cervical cancer was mass media which is parallel with study conducted in Ethiopia, Uganda and Nigeria (Envuladu et al., 2013; Getahun et al., 2013; Muliira et al., 2011). Result of this study also show that participants had poor knowledge towards cervical cancer. Indicators for this poor knowledge are, 79.4% and 61.5% of the participants did not know the etiology, and mode of transmission on cervical cancer. This is higher than the study among university students in Uganda (Muliira et al., 2011) and among all women in Ethiopia (Getahun et al., 2013) in which 61.6% and 46.1% participants in Uganda did not know the cause and mode of transmission on cervical cancer respectively. The result of this study indicated that 67.1% of the participants did

not the symptoms of cervical cancer which is lower as compare to study in Ogun state, Nigeria (Abiodun et al., 2013) in which 97.9% had poor knowledge symptoms of cervical cancer.

About 37.7% of the participants of this study did not know any risk factors of cervical cancer. This is higher than the results reported from the studies in South Africa and Yemen (Abdul-Aziz, 2012; Hoque and Hoque, 2009) but lower than from the study report in Ethiopia (Getahun et al., 2013). The most common prevention methods mentioned in this study were screening followed by vaccination and avoiding multiple sexual partner which is consistent with the studies conducted in Ethiopia and Yemen (Abdul-Aziz, 2012; Getahun et al., 2013). However, 16% of the participants did not know any prevention methods of cervical cancer. This is lower than the study in Ethiopia among all women (Getahun et al., 2013). Generally, only 35.6% of the participants had good knowledge on cervical cancer. Even though, students in higher institutions expected to have good knowledge, due to access different Medias like TV, internet and living in urban area, the result of this study indicated that the participants had poor knowledge on cervical cancer. This needs health promotion and health education interventions.

In health facilities across Ethiopia, health education is generally given to women visiting MCH clinics on maternal and child health, STIs like HIV, gonorrhea and syphilis but excluding HPV and cervical cancer. However, the absence of a standardized system of disseminating cervical cancer education to women, particularly also to youth women, in the country may be attributable to the low knowledge of cervical cancer. Furthermore, in Ethiopia, there is no organized reproductive organ cancer prevention, education, screening program (Getahun et al., 2013). Several research studies have shown that health education through different teaching strategies is an effective way of imparting knowledge and to prevent the incidence of cervical cancer. The education programs are very effective in increasing cervical cancer knowledge, perceived susceptibility, and cancer prevention behaviors. By education, women can be empowered with knowledge of cervical cancer, its early warning symptoms and the availability of adequate therapies (Abudukadeer et al., 2015; Ethiopia Ministry Of Health, 2015; Getahun et al., 2013).

Regarding perception 85% and 33.2% of the participants were believed that cervical cancer is a sever disease and the chance of acquiring the disease is high respectively. Though, three quarter of the participants believed that cervical screening can prevent cervical cancer but only 0.9% of the participants screened for cervical cancer. Barriers for not screening includes lack of information, lack of access to health facilities, considering the test is too expensive and others. These barriers like test is too expensive, fear not to be infected, fear of the procedure are perceived while lack of information, lack of access to health facilities this are considered as actual barrier. Both of them needs health education and promotion interventions.

In many studies, different socio demographic variables have shown an influence on knowledge of cervical

cancer but in this study, only source of information and awareness about STIs shown significant association with knowledge of cervical cancer. Participants who were using radio and TV as source of information were almost 2 times more like to have good knowledge on cervical cancer as compared to who did not using radio and TV and participants who had heard about STI were also 3 times more likely to have good knowledge than their counter parts. This could be due to fact that despite the difference in socio-demographic and economic background, university students who listen and watch radio and TV might get different information about cervical cancer and develop good knowledge about cervical cancer.

The findings of this study should be interpreted with some limitations. Because it was conducted at one University, so that the findings of this study may not be generalizable to students in higher institution in Ethiopia and a result of cross-sectional study design nature, the temporal sequence of events cannot be determined. Social desirability bias is also potential limitations that may have been encountered in this study.

In conclusion, although participants in this study did not report engaging in a number of risk factors associated with cervical cancer, they had poor knowledge towards etiology, mode of transmission, symptoms, prevention methods and different risk factors that increases the progression of cervical cancer as well as poor perception towards the chance of acquiring the disease. Furthermore, using TV and Radio and having information on STI were the determinants of knowledge on cervical cancer.

The result obtained in this study indicates how useful it will be to establish health education programs to increase students' awareness and knowledge about cervical cancer.

Health education interventions are needed to improve the understanding of the factors that increases the risk and the prevention methods of cervical cancer in youth women to prevent before women engage in risky behaviors so as to develop healthy behavior and decrease the incidence of the disease. Governments and non-governmental organizations should work in collaboration in improving knowledge of cervical cancer and screening among youth women.

Competing interests

The authors declare that they have no competing interests.

Authors' Contributions

KB was involved in the design of study, preparing of the tool, data collection & analysis and preparing the draft of the manuscript. TB involved in design of the study, analysis of the data, and reviewing the manuscript. All authors read and approved the final manuscript.

Acknowledgements

We would like to acknowledge Debre Berhan University for financial support to conduct this research.

We would like to thank all the participants who generously gave their trust, time and information. Lastly but not least, we want to extend our deepest gratitude to the department heads, instructors, data collectors and data managers for valuable support.

References

- Abdul-Aziz M (2012). Knowledge, attitude and practice towards cervical cancer among reproductive health clients at the University of Science and Technology Hospital-Sana'a in Yemen. *Yemeni J Med Sci*, **6**, 21–7.
- Abiodun OA, Fatungase OK, Awosile JO (2013). An assessment of women's awareness and knowledge about cervical cancer and screening and the barriers to cervical screening in Ogun State, Nigeria. *IOSR J Dental Med Sci*, **10**, 52–8.
- Abudukadeer A, Azam S, Mutailipu A, et al (2015). Knowledge and attitude of Uyghur women in Xinjiang province of China related to the prevention and early detection of cervical cancer. *World J Surg Oncol*, **13**, 110.
- Ayinde OA, Omigbodun AO, Ilesanmi AO (2004). Awareness of cervical cancer, Papanicolaou's smear and its utilisation among female undergraduates in Ibadan. *Afr J Reprod Health*, **8**, 68–80.
- Bansal Agam B, Pakhare Abhijit P, Kapoor N, Mehrotra Ragini KA (2015). Knowledge, attitude, and practices related to cervical cancer among adult women: A hospital-based cross-sectional study. *J Nat Sci Biol Med*, **6**, 324.
- Basu P, Hassan S, Fileeshia F, et al (2014). Knowledge, attitude and practices of women in Maldives related to the risk factors, prevention and early detection of cervical cancer. *Asian Pac J Cancer Prev*, **15**, 6691–5.
- Bruni L, Barrionuevo-Rosas L, Albero G, et al (2016). Human Papillomavirus and related diseases report. ICO Information Centre on HPV and Cancer (HPV Information Centre). Retrieved from www.hpvcentre.com.
- Dhendup T, Tshering P (2014). Cervical cancer knowledge and screening behaviors among female university graduates of year 2012 attending national graduate orientation program, Bhutan. *BMC Womens Health*, **14**, <http://doi.org/10.1186/1472-6874-14-44>
- Envuladu EA, Ohize VA, Agbo HA, Lar LA ZA (2013). Awareness and uptake of papanicolaou smear screening among students of a higher institution in Jos, Nigeria. *Jos J Med*, **7**, 21–6.
- Ethiopia Ministry Of Health (2015). Guideline for cervical cancer prevention and control in Ethiopia.
- Getahun F, Mazengia Fekadu AM, Birhanu Z (2013). Comprehensive knowledge about cervical cancer is low among women in Northwest Ethiopia. *BMC Cancer*, **13**, <http://doi.org/10.1186/1471-2407-13-2>.
- Hoque E, Hoque M (2009). Knowledge of and attitude towards cervical cancer among female university students in South Africa. *South Afr J Epidemiol Infect*, **24**, 21–4.
- Hoque ME (2010). Cervical cancer awareness and preventive behaviour among female university students in South Africa. *Asian Pac J Cancer Prev*, **11**, 127–30.
- ICO Information Centre on HPV and cancer (2015). Human papillomavirus and related diseases report. Barcelona, Spain.
- Isa IA, Ibukun GO, Olugbenga MK (2013). Cervical cancer screening among female undergraduates and staff in the Niger delta region of Nigeria. *Open J Obstet Gynecol*, **3**, 61–6.
- Muliira JK, Kisaakye E, Kizza I, Betty SRR (2011). Perceived cervical cancer risk, knowledge and preventive practices. *Afr J Midwifery Womens Health*, **5**, 87–93.
- Rates GI (2009). Global and regional statistics: Cervical cancer and HPV.
- Roy S, Devleena MT, Chaudhuri P, Lahiri DBJ (2011). Addition of gemcitabine to standard therapy in locally advanced cervical cancer: A randomized comparative study. *Indian J Med Paediatr Oncol*, **32**, 133–8.
- Shin HR, Franceschi S, Vaccarella S, et al (2004). Prevalence and determinants of genital infection with papillomavirus, in female and male university students in Busan, South Korea. *J Infect Dis*, **190**, 468–6.
- Stuart W, Weinstock H, Berman S, et al (2000). Sexually transmitted diseases among American youth: incidence and prevalence estimates, 2000. *Int Perspect Sex Reprod Health*, **36**, 6–10.
- World Health Organization (2013). Comprehensive cervical cancer prevention and control: a healthier future for girls and women. World Health Organisation. Geneva. Retrieved from www.who.int.



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.