AN OVERVIEW OF CERVICAL CANCER KNOWLEDGE AND SCREENING AMONG FEMALE HEALTHCARE PRACTITIONERS

Fatjona Kamberi, PhD Student
Faculty of Technical, Medical Sciences, Tirane, Albania
Gjergji Theodhosi, Prof. Dr.
University of Medicine, Tirane, Albania
Yllka Bilushi, Asst.Prof Dr.
Faculty of Public Health, Vlore, Albania
Diana Cuberi, Dr.
Vlora Regional Hospital, Albania
Enkeleda Sinaj, PhD student
Faculty of Technical, Medical Sciences, Tirane, Albania

Abstract

In Albania, cervical cancer (CC) is diagnosed in late stage with high prevalence of deaths. Little is known about the knowledge and barriers that women in general and female Healthcare Practitioners (HCPs) in particular have about it and its screening. The aim of this cross-sectional study is to assess the CC knowledge and screening among female (HCPs) in primary healthcare services and hospital, and whether differences exist between them. A standardized, structured self-administered questionnaire was used for the data collection in 116 female HCPs in Vlora city in March 2014, 67 female HCPs in primary health care services and 49 in hospital. Descriptive statistic was used for the data analysis. The study evidenced that all of HCPs in the study knew of CC. Most of them knew the association of CC and human papillomavirus infection. All agree the fact that cervical cancer is preventable. A good percentage of HCPs had knowledge of the Pap smear, but a half of them knew that it is used for the screening of CC. A small percentage of HCPs had ever had a pap smear. The results of the study indicated that there are no major differences among female HCPs. This study evidenced the need for nurses and female HCPs in general to enhance knowledge regarding cervical screening in both primary and hospital services. The study evidenced a series of barriers to effective screening services.

Introduction

In Albania, cervical cancer is diagnosed in late stage with high prevalence of deaths. Cervical cancer is the fourth most common cancer in women, and the seventh overall, with an estimated 528.000 new cases in 2012 (IARC, 2012). Almost 87% of cervical cancer deaths occur in less developed countries. In Albania the incidence and mortality from cervical cancer, there were respectively 2.7% and 1.7% (IARC, 2012). A study reveals that the prevalence of cervical cytological abnormality in Albanian females was 4.8% (Filipi &Xhani, 2014). The Pap smear (Papanicolau test) is the single most successful cancer screening tool in modern medicine (Lappen at al., 2012). The Pap smear was developed in 1928 by George Papanicolau for the identification of cervical cancer. After his publication in 1941 it became widely known and used in clinical practice in 1950s; It is now the most commonly performed cancer screening test world-wide (Papanicolaou &Traut, 1997). Cervical cancer is caused by sexually acquired infection with certain types of HPV (Human Papilloma Virus) (WHO, 2013). Cervical cancer incidence and mortality have decreased in developing countries following the introduction of screening programs, but the situation is not the same in developing countries (WHO, 2013). Encouragingly, even in the countries where only opportunistic screening is performed, well-prepared plans and strategies have been established for switching to organized screening in the near future (Maver at al., 2013). The current cervical cancer screening programs and practices in Albania are, however casual or nonexistence (Poljak at al., 2013). Refer to the National program for the cancer control, the current situation in Albania can not support mass screening programs; available resources are scarce, infrastructure is limited and most of the cancers detected are an advanced stage. In this situation, "lowering the stage" by increasing public awareness and training of medical personnel can bring a great impact on the disease and, therefore, emphasis should be placed on health education and awareness among the population and the health care practitioners (NCCP, 2011 p. 30). Also, they play a big role in educating women on the risk factors for developing malignant diseases and the possible prevention (Markov at al., 2011). The health system in Albania is mainly public. The state provides most of the services offered to the population as in the field of promotion, prevention, diagnosis and treatment. Diagnostic and curative health service is organized into three levels : primary care, hospital service secondary and tertiary hospital. Health care practitioners are commonly grouped into five key fields: Medical [including generalist practitioners and specialists]; Nursing [including various professional titles]; Midwifery [Obstetrics]; Dentistry; Other Health

Professions, including occupational therapy, pharmacy, physical therapy, paramedicine, respiratory therapy, radiographer and many others health specialists (2008-09 ADHS).

Despite the fact that in Albania in general and in Vlora city in particular health care services are mainly provided by female HCPs, little is known about cervical cancer related knowledge, attitudes, practices and screening among them.

Materials and methods
Purpose

This study investigates the current situation of knowledge, attitudes and practices of cervical cancer screening among female HCPs in primary health service and hospital. The prevalence of screening among female HCPs and if there are differences between the two groups of female HCPs.

Method and samples

This is a cross-sectional descriptive study carried out during March 2014 in Vlora Regional Hospital and in eight primary health care services in Vlora city. A total of 116 female HCPs , 67 female HCPs from the primary health services and 49 from the hospital, including the obstetric and gynecology ward were the study sample.

Inclusion criteria
- Being a female health care practitior without historic of hysterectomy.

Exclusion criteria
- Being a male health care practitioner.

Data collection instrument

A self-administered questionnaire based on literature review was used for the data collection. The questionnaire was divided in 5 parts, that contained demographic characteristics, questions on knowledge attitudes and practices regarding cervical cancer and screening. Questions that aimed at identifying barriers to effective cervical screening services were also included in the questionnaire. Ethical approval and support was granted by the respective Directors where the study was carried out. Furthermore, all participants gave their informed consent after being informed about the aims and procedures of the study and confidentiality and anonymity were assured. The questionnaire was completed by 120 health female HCPs, but 4 of them had historic of hysterectomy, so they were not included in the study.

Data analysis

Due to the small sample size the Fisher exact test was used to test results. The *two tailed P value* was used to find the significance of study variables between the two groups of female HCPs. A value of $P \leq 0,05$ was considered significant. Descriptive statistics, including frequencies, means, standard deviation, 95% coeffecient interval (CI), were computed for all study variables stratify by the two groups of HCPs. Crosstabulation (MxN) tables were used for comparison of dependent and independent variables. Epi Info[TM] 7 software version 7.1.3.10 was used for statistical calculation (CDC-Epi Info[TM]).

Results

Demographic characteristics

The sample consisted of 116 female HCPs, 67 female HCPs from the primary health services and 49 from the hospital.

69% of female HCPs in the study were nurses, midwife; 23% were general practitioner and obstetrician gynecologist; 8% were laboratory technician.

All demographic variables of female HCPs appear without differences; p>0.1. The mean age of female HCPs was 43.98 years (SD±11.24). The age range interval was 23-63 years. Almost all were married; 92.24% (n=107).

68.10% (n=79); 95% CI [58.81-76.45] of female HCPs in the study reported to have more than 10 years of professional practice; 15.52%(n=18); 95% CI [9.46-23.41] reported more than 5-10 years and 16.38% (n=19); 95% CI [10.16-24.39] reported less than 5 years .

Table 1. Source of information for cervical cancer

Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Medical/Nursing/midwifery school	82.09% (n=55)	[70.80-90.39]	73.47% (n=36)	[70.80 – 90.39]	0.36
Countinuing education	38.81% (n=26)	[27.14 – 51.50]	63.27%(n=31)	[48.29–76.58]	0.01
Medical articles	40.3% (n=27)	[28.49 – 53.00]	57.45% (n=27)	[42.18–71.74]	0.09
Brochures	37.31% (n=25)	[25.80 – 49.99]	44.90% (n=22)	[30.67–59.77]	0.44
Collegues	28.36% (n=19)	[18.01 – 40.69]	40.82% (n=20)	[27.00–55.79]	0.17
Media	32.84% (n=22)	[21.85 – 45.40]	46.94% (n=23)	[32.53–61.73]	0.17

Table 2. Attitudes and knowledge of cervical cancer symptoms and risk factors

Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Attitudes of cervical cancer					
Cervical cancer is the most common cancer of the reproductive tract (t)	91.04% (n=61)	[81.52 – 96.64]	85.71% (n=42)	[72.76 – 94.06]	0.38
All women are at risk of cervical cancer (t)	73.13% (n=69)	[60.9 – 83.24]	69.39% (n=34)	[54.58 – 81.75]	0.68
Human Papilloma Infection (HPV) is associated with cervical cancer (t)	73.13% (n=49)	[60.90 – 83.24]	67.35% (n=33)	[52.46 – 80.05]	0.53
Cervical cancer is a result of STI (sexually transmitted infection) (t)	52.24% (n=35)	[39.67 – 64.60]	38.78% (n=19)	[25.2 – 53.76]	0.18
Knowledge of cervical cancer symptoms					
Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Abnormal vaginal discharge (t)	52.24% (n=35)	[39.67 – 64.60]	57.14% (n=28)	[42.21 – 71.18]	0.7
Vaginal bleeding (t)	62.69% (n=42)	[50.01 – 74.20]	61.22% (n=30)	[46.24 – 74.80]	1
Bleeding after sexual intercourse (t)	52.24% (n=35)	[39.67 – 64.60]	69.39% 9 (n=34)	[54.58 – 81.75]	0.08
Vaginal bleeding after menopause (t)	35.82% (n=24)	[24.47 – 48.47]	59.18% 9 (n=29)	[44.21 – 73.00]	0.01
Knowledge of cervical cancer risk factors					
Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Woman has a family story of cervical cancer (t)	80.60% (n=54)	[69.11 – 84.24]	85.71% (n=42)	[72.76 – 94.06]	0.61
Woman is HIV positive (t)	29.85% (n=20)	[19.28 – 42.27]	32.65% (n=16)	[19.95 – 47.54]	0.45
Woman smokes (t)	26.87% (n=18)	[16.76 – 39.10]	44.90% (n=22)	[30.67 – 59.77]	0.05
Woman has 2 or more sexual partners (t)	62.69% (n=42)	[50.01 – 74.20]	65.31% (n=32)	[50.36 – 78.33]	0.84
Woman started sexual intercourse before the age of 20 years (t)	55.22% (n=37)	[42.58 – 67.40]	61.22% (n=30)	[46.24 – 74.80]	0.57

Knowledge of cervical cancer;symptoms and risk factors

Almost all of female HCPs in the study reported to have information about cervical canc

er, 99.14% (n=115); 95% CI [95.29-99.98]; P ≤ 0,05.

(t)=the correct answer to the item is "true;" (f)=the correct answer to the item is "false;"

Knowledge of cervical cancer prevention and screening

100% (n=116) of female HCPs in the study reported to have that cervical cancer is preventable, screening can detect precancerous lesions and the regular examination is very important.

78.45% (n=91) of female HCPs have knowledge of cervical cytology testing (Pap test); p >0.05. Table 3 shows the responses of female HCPs regarding the use of Pap smear and the woman's age to start screening.

Table 3. Pap smear is used for & the age to start screening

Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Treatment of cervical cancer (f)	0.00% (n=0)	[0 - 5.36]	14.29% (n=7)	[5.94 – 27.24]	0.0018
Screening of cervical cancer (t)	35.82% (n=24)	[24.47 – 48.47]	36.73%(n=18)	[23.42– 51.71]	1
Both treatment and screening (f)	43.28% (n=29)	[31.22 – 55.96]	34.69% (n=17)	[21.67– 49.64]	0.44
Age to start screening for cervical cancer					
Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
After becoming sexually active(t)	35.82% (n=24)	[24.47 – 48.47]	42.86% (n=21)	[28.82 – 57.79]	0.44
< 30 years old(f)	37.31% (n=25)	[25.80 – 49.99]	26.53%(n=13)	[14.95– 41.08]	0.23
< 40 years old(f)	29.85% (n=20)	[19.28 – 42.27]	48.98% (n=24)	[34.42– 63.66]	0.05

(t)=the correct answer to the item is "true;" (f)=the correct answer to the item is "false;"

Attitudes, practices toward cervical cancer;prevalence of Pap test 39.66% (n=46); 95% CI [30.69-49.16] of female HCPs in the study reported that the gender of Pap test provider influences to get it and 55.65% (n=64);

95% CI [46.09-64.91] would prefer a female physician for this service; p>0.05.

93.04% (n=107); 95% CI [86.75-96.95] of female HCPs in the study consider cervical cancer screening as a priority for the health community and only 26.72 % (n=31); 95% CI [18.93-35.74] refer to make a health routine education for cervical cancer.

20.69% (n=24); 95% CI [13.73-29.20] of female HCPs in the study reported to be aware of national cervical cancer guide.

8.96% (n=6); 95% CI [3.36-18.48] of female HCPs primary services and 28.57% (n=14); 95% CI [16.58-43.26]; p=0. 0035 of female HCPs in hospital (n=15); p=0.006, were able to perform cervical cancer screening Pap smear as a technique.

The prevalence of Pap smear among female HCPs in the study and the reasons for not getting a Pap smear is presented in Table 4.

Table 4. Pap test prevalence

Variables	Female HCPs in primary service(%)		Female HCPs in hospital (%)		2 tailed p
	Yes (%)	No(%)	Yes (%)	No (%)	
Have you ever had a Pap smear	20.90%	79.1%	22.45%	77.55%	0.51
Reasons for not getting pap test					
Variables	Female HCP in primary services (%)		Female HCP in hospital(%)		2 tailed p
Lack of symptoms	68.66%		69.39%		1
Dislike of gynecologic examinations	8.96%		18.37%		0.16
Lack of service delivery	32.84%		12.24%		0.014

Barriers to effective screening services

Different barriers to effective cervical screening reported by female HCPs in the study are presented in table 5.

Table 5. Barriers to effective screening services

Variables	Female HCPs in primary services (%)(n)	95% CI	Female HCPs in hospital (%)(n)	95% CI	2 tailed p
Insufficient training staf	77.61% (n=52)	[65.78-86.89]	65.31% (n=32)	[50.36 – 78.33]	0.20
Insufficient materials *	77.61% (n=52)	[65.78 – 86.89]	46.94%(n=23)	[32.53–61.73]	0.0008
Lack ol laboratory facility	80.60% (n=54)	[69.11 – 89.24]	85.71% (n=42)	[72.76–94.06]	0.61
Inadeguate system for monitoring	34.33% (n=23)	[23.15 – 46.94]	48.98% (n=24)	[34.42–63.66]	0.12
Inadeguate referral system	32.84% (n=22)	[21.85 – 45.40]	48.98% (n=24)	[34.42–63.66]	0.08

Discussion

Of 120 questionnaires distributed 116, (67 by the primary health services and 49 by the hospital) were in accuracy with study criteria (response rate 96.6%). The highest percentage of female HCPs were nurses and midwives (69%). Between the two groups, there was no statistical significance in terms of demographic characteristics.

The results show that most of female HCPs have the right basic information about cervical cancer. Despite the fact that the most of the female HCPs were middle aged, and the highest percentage 68.10% (n=79) of them reported more than 10 years of professional practice, as it is shown in Table 1, the source of this information, with the highest percentage, were the respective university studies. Also, there was no statistical significance in terms of knowledge between the two groups of female HCPs. Hospital female HCPs report the highest percentage of information on cervical cancer also from other sources. The fact that female HCPs in hospital had the highest level of knowledge might be explained with the fact that most of them belong to the obstetrical gynecology ward. Also, in this group the continuing education reported the highest percentage, 63.27% versus 38.81% of female HCPs in primary services.

Studies have shown that increasing knowledge about cervical cancer and its screening is a very important way to decrease the cases. Educational approaches to health care practitioners in general may improve the effectiveness of cervical cancer screening (Lourenço at al., 2012).

Most of the female HCPs, (Table 2) with prevalence in primary health services reported that Human Papilloma Virus (HPV) is associated with cervical cancer but nearly half of them do not associate cervical cancer with sexually transmitted infections .

The results on the Table 2, shows that insufficient information exists for cervical cancer symptoms and risk factors. It seems that hospital female HCPs, despite the lack of statistical significance has more knowledge about the symptoms and risk factors. Although many studies (Roura E, et al., 2014; Henley SJ, et al., 2014; Muñoz N.et al., 2002; Moreno V, et al., 2002; Remschmidt C et al., 2013) have clearly identified the major risk factors of cervical cancer in our study results, the family history is reported as the main risk factor. While other risk factors, especially smoking, are reported mainly in very low levels by female HCPs in primary services 26.87 % (n = 18); p=0. 05.

More than fourthfifths of female HCPs have reported to have basic knowledge of Pap test; p >0.05. The results are not consistent with the findings of Albania Demographic and Health Survey 2008-09 which shows that women have better knowledge of mammograms than Pap test. All agree the fact that cervical cancer is preventable, screening can detect precancerous

lesions and the regular examination is very important but Table 3 shows the presence of misconceptions about the use of Pap test. 14.29%, p=0.0018 of female hospital HCPs reported that Pap smear is used for the treatment of cervical cancer. Only 32.82% of female HCPs in primary services and 36.73% of female hospital HCPs, p=1 reported that Pap smear is used for the screening of cervical cancer.

Also, ambiguities existed about the timing of when a woman should begin the regular examination, no statistical significance was found. Although different health guides have clearly defined the period when women should start regular examination and its importance in decreasing chances of dying from cervical cancer (WHO, 2013; NCI, 2014).

The prevalence of Pap test or screening as seen in Table 4 among all female HCPs in the study is reported in very small numbers. Only 20.9% of female HCPs in primary services and 22.45% of female hospital HCPs reported to ever had a Pap smear in their life;p>0.05. The main reason cited for not screened reported with equal means in the two groups of female HCPs the lack of symptoms. The results are consistent with other studies carried out in developing countries (Thippeveeranna C et al., 2013).

Despite the study population were female HCPs the results cited that the gen der of Pap smear provider influences to get it. A half of female HCPs prefer a femalem physician for this service ;p>0.05. The results consistent with a study where the patients of the women physicians were screened at a higher rate than were the patients of the men physicians (Kreuter MW et al., 1995).

Even if health care practitioners both in primary and secondary services have a potential role in motivating that regular women examination is very important (Markov at al., 2011), in our study only 26.72 % of female HCPs reported to make a health routine education for cervical cancer.

In terms of practice the results shows that only vetem 8.96% of female HCPs in primary services and 28.57% ; p=0.006 of female hospital HCPs could perform the Pap smear examination.

As seen in Table 5, barriers to effective screening services reported with no statistical significance between the two groups of female HCPs exept the insufficient materials; p=0.0008. The main barriers mentioned with no difference in means in both groups are insufficient training staf, insufficient materials and the lack ol laboratory facility. The results are consistent with the National program for the cancer control (NCCP, 2011 p. 30).

Conclusion

Although the sample that was used was small, the study provides a comprehensive overview of the current situation of knowledge, attitudes and screening regarding cervical cancer among female HCPs.

Despite that knowledge about the topic can be considered good with no differences between the two groups of female HCPs, the study evidenced the need for female HCPs in general and nurses in particular to enhance knowledge on cervical screening in both primary and hospital services.

Low prevalence of women screened among female HCPs shows that they primarily do not care for yourself though they are responsible for the health education and screening promotion.

Evidence from a study of barriers to effective screening services,and the lack of other similar studies in the field of, will in the future serve as a reference point in the development of promotional campaigns for cervical cancer and its screening.

More research in a large group of women is also needed to establish factors that influence cervical screening and explain the low participation.

Acknowledgements

References:

WHO; IARC, (2012) (International Agency for Research on Cancer [IARC]; http://globocan.iarc.fr/Pages/fact_sheets_population.aspx?country=8; http://globocan.iarc.fr/Pages/fact_sheets_population.aspx?country=900

Filipi K., Xhani A. ,(2014). Assessment of cervical cytological data in Albanian females.

Asian Pac J Cancer Prev.;15(5):2129-32.Justin Lappen and Dana R. Gossett (2012). Evidence –Based cervical Cancer Screening:

The modern Evolution of the Pap Smear,Evidence Based Medicine- Closer to Patients or Scientists?, Prof.Nikolaos Sitaras(Ed), ISBN:978-953-51-0504-6,InTech,Availablefrom: http://www.intechopen.com/books/evidence-based-%20medicine-closer-to%20patients%20-or%20scientists-/evidence-based-cervical-cancer-screening-the%20modern%20evolution-of%20the%20pap%20smear Papanicolaou GN, Traut HF (1977). Article title: The diagnostic value of vaginal smears in carcinoma of the uterus 1941. Journal Title:Arch Pathol Lab Med. Mar;121(3):211-24.

WHO (2013). Article title: Human papillomavirus (HPV) and cervical cancer. Fact sheet N°380,September 2013. Available from: http://www.who.int/mediacentre/factsheets/fs380/en/

Maver PJ, Seme K, Korać T, Dimitrov G, Döbrőssy L, Engele L, Iljazović E,Kesić V. Kostova P, Laušević D, Maurina A, Nicula FA, Panayotova Y, Primic ŽakeljM, Repše Fokter A, Romejko-Wolniewicz E, Smailytė G,

Şuteu O, Świderska-Kiec J, Tachezy R, Valerianova Z, Veerus P, Vīberga I, Znaor A, Zubor P, Poljak M (2013).Cervical cancer screening practices in central and eastern Europe in 2012. ActaDermatovenerol Alp Panonica Adriat.;22(1):7-19.

Poljak M, Seme K, Maver PJ, Kocjan BJ, Cuschieri KS, Rogovskaya SI, Arbyn M,Syrjänen S. (2013).Human papillomavirus prevalence and type-distribution, cervicalcancer screening practices and current status of vaccination implementation in Central and Eastern Europe. Vaccine. Dec 31;31 Suppl 7:H59-70. doi:10.1016/j.vaccine.2013.03.029.

NCCP (2011 p. 30); THE NATIONAL CANCER CONTROL PROGRAM 2011-2020 .   http://www.cancerindex.org/Albania

Markov Z, Bosić Zivanović D (2011).Article title: Role of the chosen general practitioner in educating women on the importance of regular gynecological examinations. Journal Title .Med Pregl. Sep-Oct;64(9-10):486-9.

Institute of Statistics, Institute of Public Health [Albania] and ICF Macro. 2010. *Albania Demographic and Health Survey 2008-09.* Tirana, Albania: Institute of Statistics, Institute of Public Health and ICF Macro.

CDC-Epi Info^{TM}(http://wwwn.cdc.gov/epiinfo/)

Lourenço AV, Fregnani CM, Silva PC, Latorre MR, Fregnani JH (2012) . Article title: Why are women with cervical cancer not being diagnosed in preinvasive phase? An analysis of risk factors using a hierarchical model. Journal Title. Int J Gynecol Cancer.May;22(4):645-53. doi: 10.1097/IGC.0b013e318246a1af.

American Cancer Society [ACS], (2013).

http://www.cancer.gov/cancertopics/screening/pap-tests-cervical-health

Roura E, Castellsagué X, Pawlita M, Travier N, Waterboer T, Margall N, Bosch FX, de

Sanjosé S, Dillner J, Gram IT, Tjønneland A, Munk C, Pala V, Palli D, Khaw KT, Barnabas RV, Overvad K, Clavel-Chapelon F, Boutron-Ruault MC, Fagherazzi G, Kaaks R, Lukanova A, Steffen A, Trichopoulou A, Trichopoulos D, Klinaki E, Tumino R, Sacerdote C, Panico S, Bueno-de-Mesquita HB, Peeters PH, Lund E, Weiderpass E, Redondo ML, Sánchez MJ, Tormo MJ, Barricarte A, Larrañaga N, Ekström J, Hortlund M, Lindquist D, Wareham N, Travis RC, Rinaldi S, Tommasino M, Franceschi S, Riboli E.(2014). Smoking as a major risk factor for cervical cancer and pre-cancer: Results from the EPIC cohort. Int J Cancer. Jul 15;135(2):453-66. doi: 10.1002/ijc.28666.

Henley SJ, Singh S, King J, Wilson R, Ryerson B; Centers for Disease Control and Prevention (CDC), (2014). Invasive cancer incidence - United States, 2010. MMWR Morb Mortal Wkly Rep. Mar 28;63(12):253-9.

Muñoz N, Franceschi S, Bosetti C, et al.(2002): Role of parity and human papillomavirus in cervical cancer: the IARC multicentric case-control study. Lancet 359 (9312): 1093-101. Moreno V, Bosch FX, Muñoz N, et al.(2002): Effect of oral contraceptives on risk of cervical cancer in women with human papillomavirus infection: the IARC multicentric case-control study. Lancet 359 (9312): 1085-92.

Remschmidt C, Kaufmann AM, Hagemann I, Vartazarova E, Wichmann O, Deleré Y.,(2013) Risk factors for cervical human papillomavirus infection and high-grade intraepithelial lesion in women aged 20 to 31 years in Germany.IntJGynecol   Cancer.   Mar;23(3):519-26.   doi: 10.1097/IGC.0b013e318285a4b2.

Thippeveeranna C, Mohan SS, Singh LR, Singh NN. (2013). Knowledge, attitude and practice of   the pap smear as a screening procedure among nurses in a tertiary hospital in north eastern India. Asian Pac J Cancer Prev.;14(2):849-52.

National Cancer Institute [NCI],(2014).

http://www.cancer.gov/cancertopics/screening/pap-tests-cervical-health

Munro A, Pavicic H, Leung Y, Westoby V, Steel N, Semmens J, O'Leary P.(2014). The role of general practitioners in the continued success of the National Cervical Screening Program.Aust Fam Physician. 2014 May;43(5):293-6.

Kreuter MW, Strecher VJ, Harris R, Kobrin SC, Skinner CS. (1995). Are patients of women physicians screened more aggressively? A prospective study of physician gender and screening. J Gen Intern Med. Mar;10(3):119-25.