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**KNOWLEDGE AND UTILIZATION OF PAP SMEAR
AMONG WOMEN ATTENDING THE ANTENATAL AND
GYNAECOLOGICAL CLINIC AT THE UNIVERSITY
TEACHING HOSPITAL IN LUSAKA**

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**DESSERTATION SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENT AND FOR THE DEGREE OF MASTER OF
MEDICINE IN OBSTETRICS AND GYNAECOLOGY**

2006



DEDICATION

TO ALL WOMEN WHO HAVE DIED OF AND ALL WHO HAVE CERVICAL
CANCER. THERE IS HOPE THAT ONE DAY A CURE WILL BE FOUND

ACKNOWLEDGEMENTS

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9. My sponsors, Central Board of Health.
10. Finally, special thanks to my wife Carole and my daughter Chilumba for their support throughout the course of this project.

STATEMENT

I HEREBY STATE THAT THIS DISSERTATION IS ENTIRELY THE
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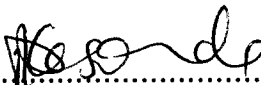
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APPROVAL

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APPROVED AS FULFILLING PART OF THE REQUIREMENTS FOR
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ABSTRACT

Background

Pap smear is a screening test used to examine cells from cervix and vagina to determine whether there is evidence of precancerous changes or cancer. Cervical cancer is a major public health problem in the world, and it is a leading cause of cancer deaths in the third world. Cervical cancer is a preventable disease. The estimated global number of deaths from cervical cancer in the year 2000 was 233,372 with 470, 606 reported new cases. The majority of women who suffer from cancer of the cervix are diagnosed to have advanced stage of the disease without having obtained a Pap smear before. The death toll from cervical cancer at the University Teaching Hospital in Lusaka is on the increase, with records showing 160 and 251 women dying from cervical cancer for the periods 1994 to 1998 and 1999 to 2003, respectively. There is an increase in the number of Pap smears being done, 367 and 842 for the years 1997 and 2003, respectively.

Aims

The aims of this project were to determine the level of knowledge about Pap smear and cervical cancer, assess the level of Pap smear use and identify factors that may be associated with low uptake of Pap smear at the University Teaching Hospital.

Methods

A structured questionnaire was used to obtain information from 1069 women aged 18 years and above, who attended the antenatal and gynaecological clinics over a period of six months. Information collected from women included questions on demographic data, knowledge about cancer of the cervix, knowledge about Pap smear, and utilization of Pap smear.

Results

Using SPSS for data analysis, we have established that the level of knowledge about cancer of the cervix is low among the women who were interviewed, with the majority of women (80.3%) scoring less than 50% of the total score. The level of knowledge about Pap smear is equally low, only 9.6% of women scored more than 50% of the total score. 320 (30.4%) women had heard about Pap smear, and of these 151 (47.2%) agreed that the Pap smear is important. 148 (14.0%) respondents knew what a Pap smear is. We have also established that marital status can be an important factor in awareness of cervical cancer and Pap smear, as evidenced by significantly different mean scores on overall knowledge score among classes of marital status ($p = 0.003$). Educational background was found to be an important factor in awareness of cervical cancer and Pap smear, as means of the overall knowledge score differed significantly among educational levels ($p < 0.001$). This study has also shown that most women are not aware of the existence of Pap smear screening facilities at UTH, only 86 (8.1%) out of 1059 knew about its existence.

Conclusion

The study has shown that there is need to focus on health education about cancer of the cervix and Pap smear. Women from rural areas need to be empowered with basic knowledge about cervical cancer risks, symptoms, screening and treatment options. There is also need to sensitise medical personnel on the importance of disseminating health information and promotion of Pap smears.

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ABBREVIATIONS

AIDS	ACQUIRED IMMUNODEFICIENCY SYNDROME
CIN	CERVICAL INTRAEPITHELIAL NEOPLASIA
DNA	DEOXYRIBONUCLEIC ACID
HIV	HUMAN IMMUNODEFICIENCY VIRUS
HPV	HUMAN PAPILLOMA VIRUS
HSV	HERPES SIMPLEX VIRUS
UTH	UNIVERSITY TEACHING HOSPITAL
VIA	VISUAL INSPECTION WITH ACETIC ACID

1. INTRODUCTION

A Pap smear (also called a Pap test) is a screening test used to examine cells from the cervix and vagina. Cervical and vaginal cells are studied to determine whether there is evidence of precancerous changes or cancer. This study will determine the level of knowledge about Pap smear and cervical cancer, assess the level of Pap smear use and identifying factors that may be associated with low uptake of Pap smear at the University Teaching Hospital (UTH).

Cervical cancer is a major public health problem in the world. It is considered the third most common cancer worldwide and the leading cause of cancer deaths in the third world (1). The estimated global number of deaths from cervical cancer in the year 2000 was 233,372 with 470, 606 reported new cases (2). Almost 80 % of these, new cases occur in developing countries, and at least 200,000 die of the disease annually (3, 4).

Unlike many cancers, cervical cancer can be prevented by using relatively inexpensive screening and treatment technologies to detect abnormal cervical tissue before it progresses to invasive cancer. Because there are often no symptoms associated with early stages of cervical cancer, it is important that women are screened for the disease. Screening technologies include Pap smear, Colposcopy, Human Papilloma Virus (HPV) Deoxynucleotide Acid (DNA) testing and Visual Inspection with Acetic Acid (VIA). Studies worldwide show that screening for cervical cancer not only decreases mortality but also probably does so by decreasing the incidence (5, 6, 7, 8). There is evidence to show that there has been no decrease in

the incidence of cervical cancer without a screening program being implemented (4, 6).

The Pap smear is the main method of cervical cancer screening currently in use in Zambia. The majority of women who suffer from cancer of the cervix are diagnosed to have advanced stage of the disease without having obtained a Pap smear before. The reason for this may be due to lack of knowledge about Pap smear, assumed ignorance about prevention and symptoms of cervical cancer, difficulty accessing health care, cultural beliefs, lack of trained manpower, limited infrastructure and other competing health priorities that hinders the Government of Zambia to effectively implement successful programs aimed at reducing the morbidity of cervical cancer.

The UTH is one of the government hospitals that provide Pap smear screening services in Zambia. Women with symptoms suggestive of cervical cancer are referred to UTH from other health centres throughout the country for further management. Women who request for voluntary Pap smear are also attended to at UTH. The death toll from cervical cancer at UTH and indeed in Zambia is on the increase. However, by using basic principles such as Pap smear screening strategies, VIA and treatment of precancerous lesions on one hand, and increasing cervical cancer awareness on the other hand, the incidence of invasive cancer could be reduced in Zambia.

2. LITERATURE REVIEW

2.1 PAP SMEAR

The Pap smear has been recognised in the world as an effective cancer screening test in the history of Medicine. The Pap smear was discovered in 1943 by Dr George Papanicolaou, and has saved countless lives by identifying who among the supposedly low-risk is in fact at high risk of cervical cancer.

For a Pap smear, a health professional inserts a speculum inside the woman's vagina to expose the cervix. A spatula is then used to scrape cells off the cervix. This takes only a few minutes to perform. The collected sample is spread directly upon a glass slide and sent for cytological examination, where it is analysed for the presence of pre-cancerous cells. The objectives of cervical screening can only be achieved by detecting cervical premalignancy. When a properly organized programme is implemented, substantial reductions in both incidence and mortality from cervical cancer are achieved (9).

It is widely believed that the use of Pap smear has been responsible for the drastic reduction in the incidence and mortality of cervical cancer in the United States, Canada, and much of Western Europe in the last 50 years (10). In the United States, available data show a decrease of approximately 50 % in both the incidence of and death rate for cervical cancer during the period 1973 to 1999 (11). Elsewhere, like in Singapore, feasibility studies are under way to implement a population cervical cancer screening programme, and Pap smear is under review (12).

The Pap smear is by no means a perfect test and its major drawback is a false-negative result (13). False-negative rates continue to be reported, even recently (14). The causes of false negative results include improper sampling, preparation errors and laboratory misinterpretations. Other factors that may cause inaccurate results of a Pap smear are menstrual blood, vaginal lubricants, douches, and vaginal medications.

Another pitfall of Pap smear is a lower sensitivity albeit a higher specificity in terms of accuracy (15). A study in which a large asymptomatic population was screened using Pap smear reviewed a sensitivity of 44 -52% with a specificity of 91-94% (16). In low resource settings, VIA is a potential alternative to Pap smear. A recent analysis of cervical screening strategies of low resource settings found VIA to be cost effective and when coupled with immediate treatment, it reduced the incidence of cervical cancer by 26% (17). However, when compared to Pap smear, VIA is less specific with a low positive predictive value for high-grade disease (18). VIA has potential advantages over other methods because it provides immediate feedback of results and enables prompt treatment making it ideal for third world countries.

Adjunctive mechanisms used to enhance Pap testing include automated slide-handling systems, computerized microscope, automated Pap smear screening, computerized re-screening of conventionally negative Pap smears, and monolayer preparation of cervical smears (19). In addition, non-cytological methods, such as cervicography and microelectrical detection of biophysical changes of cervical smears, have been studied (20). But such adjunctive mechanisms increase cost of screening significantly, and are not routinely employed.

HPV DNA testing has been utilized as an adjunct to cytology screening because of its central aetiologic role in cervical carcinogenesis (21, 22, 23). Studies are underway to develop HPV vaccines, with the anticipated perceived potential of eradicating a large proportion of the cervical cancer incidence in future. Even then, this may not eliminate the requirement for screening programs, and the feasibility of HPV DNA testing has not been demonstrated in the setting of low-resource, developing countries. Therefore, Pap testing will continue to be necessary for the near future.

The failures of cervical cancer screening attributable to failures in programmatic quality, rather than to technological limitations of the Pap smear test, has shifted scientific focus from new technology towards quality assurance. A retrospective review has highlighted problem areas for laboratory education and quality improvement efforts, and strong liability concerns have prompted the need for laboratory regulation (24). The factors critical to having a successful Pap smear screening program include achieving a wide coverage of women screened in the community, the sensitivity and specificity of the Pap test and the prompt effective management of pre-cancerous cervical abnormalities detected through screening.

2.2 CERVICAL CANCER

2.2.1 ANATOMY OF CERVIX

The cervix is the lower part of the uterus that connects the uterus to the vagina. It is cylindrical in shape, narrower than the body of the uterus and around 2.5 cm in length in an adult. It has two portions; the upper, supravaginal and the lower vaginal portions. The cervix consists of mainly fibrous tissue than muscular, the latter being confined to the upper portion (25). The epithelium of the endocervix is cylindrical and

ciliated in its upper two-thirds. It changes to stratified squamous epithelium around the region of the external os. This change may be abrupt or there may be a transitional zone up to 1 cm in width.

2.2.2 ORIGIN OF CERVICAL NEOPLASM

The stratified squamous epithelium of the vagina and the ectocervix meets the columnar epithelium of the endocervix at the squamocolumnar junction. This is the site of origin of most preinvasive and invasive squamous cell cervical neoplasias.

2.2.3 AETIOLOGY OF CERVICAL CANCER

2.2.3.1 HPV INFECTION

It has now become clear that HPV is closely associated with cervical carcinogenesis (26). HPV which now includes over 80 types includes high-risk oncogenic types e.g. 16, 18, 31, 33, and low types e.g. 6 and 11. Although the complex molecular biology of HPV is not fully understood, the scientific community believes that HPV infection is essential, but not solely sufficient to achieve cancerous development. In addition to understanding its role in carcinogenesis, there is considerable interest now in exploiting its close association with cervical neoplasia in a pragmatic way to use it as a marker in several settings, including population screening (27).

It is thought that the majority of women have an HPV infection at some time in their lives. The prevalence in women aged 20-25 is probably 20% (28). Indeed, 44% of young women will acquire HPV infection within 3 years of commencing sexual relations and 26% will show evidence of a second, different infection (28). There is evidence to show that in some women HPV infection may persist and after 2 years or

more, the relative risk of developing high grade lesions, cervical intraepithelial neoplasia (CIN) III is extremely high (29). The length of time for lesions to transit from early events in precancer to invasive disease is obviously variable, but is said to be of the order of 10 years or more. The median age for women with CIN III is around 30 years compared with 40-45 years for invasive cancer (25).

2.2.3.2 CO-FACTORS

It is well known that early age at first sexual intercourse and multiple partners are risk factors associated with CIN and cervical cancer. Sexual activity is very important and while this may be largely accounted for by transmission of HPV, a number of studies have implicated other sexually transmitted diseases. Most prominent in the 1980s were seroepidemiological studies of Herpes simplex virus (HSV), especially HSV-2, (30), but more recently, interest has focused on Chlamydia and a recent study has reported a significant association (31). A possible common factor is the immunosuppressant found in semen that inhibits the lymphocyte response to infection with Epstein – Barr virus (32).

Recently the relationship between abnormal cervical cytology and Human immunodeficiency virus (HIV) infection has come into the spotlight. HIV positive women have a very high incidence of CIN III, though the increased risk for invasive cancer is not yet known. In fact, in poor resource countries like Zambia, invasive cervical carcinoma is a likely clinical indicator of Acquired Immunodeficiency Syndrome (AIDS). Studies have shown that HIV positive women are more likely to progress to invasive cervical carcinoma than HIV negative women (33, 34).

A cross sectional study conducted on 554 women attending family planning clinics in Harare showed an increased prevalence of abnormal cervical cytology of about five fold in HIV positive women when compared to HIV negative women (35). There is evidence that the incidence of HPV is much higher in HIV positive women than in their counterparts. A recent study in Brazil showed that a very high proportion of HIV infected women are infected with HPV and often carry multiple HPV genotypes (36). The incidence of CIN is greater when immunosuppression is more marked (37).

The other significant risk factor is smoking, which is considered a high risk factor for carcinoma of the cervix, and this observation correlates with distribution of other smoking-related cancers. Many epidemiological studies have indicated a higher prevalence of smokers among women who develop CIN and cancer and that the risk may increase with pack- years smoked (38, 39). Smoking may affect the early evolution of HPV-related lesions possibly by increasing the rate of cell turnover (40). A study which performed a pooled analysis of 10 previously published case-control studies on the role of smoking as a cofactor of progression from HPV to cancer has reviewed unequivocal evidence (41).

Smoking during HIV infection may alter the natural history of HPV infection and increase the risk for cervical cancer. A recent study has shown that among HIV-infected women, smoking is associated with a significantly higher prevalence and incidence of HPV infection (42). It is possible that stopping smoking could result in CIN lesion regression and a report has shown that smoking increases the risk of treatment failure of CIN (43).

Numerous epidemiological studies reported in the literature have established a positive association between cancer of the cervix and multiple, independent social factors. A greater incidence of cervical cancer is observed among blacks and Mexican Americans, and this is undoubtedly related to their lower socioeconomic status (44). Socioeconomic status is interrelated, since an association has long been noted between relative poverty and early marriage and youthful childbearing. Indeed cervical cancer is rare in celibate groups such as catholic nuns (25). Reviews on suggestions of the role of vitamin deficiency and oral contraceptives in cervical cancer have failed to show a consistent association.

2.2.4 INCIDENCE OF CERVICAL CANCER

The international Agency for Research on Cancer estimates that nearly 380,000 women are diagnosed with cervical cancer worldwide each year (1). The number of cases and number of deaths from cervical cancer are higher in less developed countries where routine screening is not widespread (1). Researchers estimate that non-invasive cervical cancer is nearly four times as likely as invasive cancer (25). The distribution of estimated cervical cancer cases and deaths from cervical cancer worldwide in the year 2000 is shown in Table 1.

Although records obtained from the Health Information System Department at UTH does not show any increase in the incidence of cervical cancer for the periods of 1994 to 1998 and 1999 to 2003, indicating incidences of 1256 and 1124 respectively, the death toll over the same periods has increased. The number of deaths from cervical cancer recorded for the same periods show 160 and 251 respectively as shown in

Table 2. There is a gradual increase in annual Pap smear tests that are performed at UTH from 1997 to 2003 as shown in Table 3.

Table1. Incidence of cervical cancer and deaths worldwide in 2000

Region	New cases (2000)	Deaths (2000)
Eastern Africa	30,206	15,837
Middle Africa	6,947	3,799
Northern Africa	10,479	5,524
Southern Africa	5,541	2,906
Western Africa	13,903	7,154
Caribbean	6,670	3,143
Central America	21,596	8,690
South America	49,025	18,737
North America	14,845	7,070
Eastern Asia	51,266	25,639
South-Eastern Asia	39,648	20,462
South-Central Asia	151,297	83,678
Western Asia	3,458	1,765
Eastern Europe	35,482	15,180
Northern Europe	6,049	3,162
Southern Europe	10,116	4,011
Western Europe	13,282	6,207
Australia/New Zealand	1,077	432
Melanesia	983	510
Micronesia	25	12
Polynesia	70	11
Worldwide	470,606	233,350
More Developed Countries	91,451	39,350
Less Developed Countries	379,153	194,025

Reproduced from J. Ferly, Bray P, Pisani P and Parkin DM. GLOBOCAN 2000: Cancer incidence, Mortality and Prevalence worldwide, Version 1.0. IARC CancerBase No 5, IARCPress, 2001

Table 2. Incidence of cervical cancer and deaths at UTH from 1994 to 2003

Year	Incidence	Deaths
1994	199	21
1995	252	36
1996	273	33
1997	260	35
1998	272	35
1999	248	42
2000	182	41
2001	208	43
2002	233	52
2003	253	73

Data obtained from Health Information System Department at UTH

Table 3. Annual Pap smear tests performed at UTH from 1997 to 2003

Year	Pap smear Tests
1997	367
1998	451
1999	584
2000	445
2001	554
2002	616
2003	842

Data obtained from Health Information System Department at UTH

The number of women undergoing diagnostic staging of suspected cervical cancer is also increasing at UTH. For the year 2002, records show that 144 patients underwent diagnostic staging compared to 93 in the year 1997. An audit from the emergency out-patient gynaecological ward shows that on average 25 women with symptoms suggestive of cervical cancer are seen every month.

2.2.5 DIAGNOSIS AND MANAGEMENT OF CERVICAL CANCER

2.2.5.1 PRESENTATION OF CERVICAL CANCER

The most common presentation of cervical cancer is abnormal vaginal bleeding. In younger women this could constitute intermenstrual or postcoital bleeding and in older women, postmenopausal bleeding. Other typical forms of presentation include

vaginal discharge and abdominal pains. In some cases the patient remains asymptomatic but the cancer is detected by the process of cervical screening. At UTH, experience shows that most women present with longstanding history of watery blood stained vaginal discharge with or without abdominal pains, which is indicative of advanced disease.

2.2.5.2 CLINICAL EXAMINATION

Physical examination should include careful examination of the supraclavicular and inguinal nodes and palpation of the abdomen for enlarged liver or kidneys. Preliminary speculum examination of the cervix should be performed prior to gentle digital examination. Rectovaginal examination is the best method to assess parametrial and posterior spread of cancer. A punch biopsy may be performed if there is an obvious lesion present. If cervical cancer is suspected, the correct action is referral for colposcopy and biopsy. Ideally examination under anaesthesia is performed by the gynaecologist and radiotherapist jointly, where biopsy and staging of the disease is undertaken. Examination under anaesthesia may be unnecessary if High-quality Magnetic Resonance (MR) imaging is available, especially with the aid of a transvaginal coil.

2.2.5.3 STAGING

Accurate staging of cervical cancer is required because the effectiveness of treatment largely depends on the extent of the disease. The extent of the disease may be defined as the size of the tumour locally, involvement of adjacent tissues, such as the parametrium or the bladder, and the presence of metastasis. Table 4 shows the FIGO 1998 classification of cervical cancer, which is the most widely used. For staging,

bimanual examination under anaesthesia is performed by more than one examiner.

Surgical staging has been advocated, particularly to assess involvement of the para-aortic nodes but this usually delays the commencement of radiotherapy.

Table 4: The FIGO staging classification for cervical cancer (FIGO 1998)

Stage	Description
0	Preinvasive carcinoma (carcinoma in situ, CIN)
I	Carcinoma confined to the cervix (corpus extension should be disregarded)
Ia	Invasive cancer identified only microscopically. All gross lesions, even with superficial invasion, are stage Ib cancers. Depth of measured stromal invasion should not be greater than 5 mm and no wider than 7 mm.
Ia1	Measured invasion no greater than 3 mm in depth and no wider than 7 mm
Ia2	Measured invasion greater than 3 mm and no greater than 5 mm and no wider than 7 mm
Ib	Clinical lesions confined to the cervix or preclinical lesions greater than Ia
Ib1	Clinical lesions no greater than 4 cm in size
Ib2	Clinical lesions greater than 4 cm
II	Carcinoma extending beyond the cervix and involving the vagina (but not the lower third) and/or infiltrating the parametrium (but not reaching the pelvic side wall)
IIa	Carcinoma has involved the vagina
IIb	Carcinoma has infiltrated the parametrium
III	Carcinoma involving the lower third of the vagina and/or hydronephrosis or non-functioning kidney due to ureterostenosis caused by tumour.
IIIa	Carcinoma involving the lower third of the vagina
IIIb	Carcinoma extending to the pelvic wall and/or hydronephrosis or non-functioning kidney due to ureterostenosis caused by tumour
IVa	Carcinoma involving the mucosa of the bladder or rectum and/or extending beyond the true pelvis
IVb	Spread to distant organs

2.2.5.4 INVESTIGATIONS

Mandatory investigations include a full blood count, urea and electrolytes, liver function tests, intravenous urogram and chest X-ray. Computer Tomography and abdominopelvic ultrasound may be used to estimate the size and extent of the primary tumour and to detect nodal disease, but neither is sufficiently accurate to merit routine use. The best imaging method is MR, as it can give reliable information such as

tumour volume and extent of uterine and parametrial involvement. However, MR is unable to identify small metastatic deposits in lymph nodes.

2.2.5.5 MANAGEMENT OF MICROINVASIVE DISEASE

The value of the term ‘microinvasive disease’ lies in defining early invasive disease with virtually no risk of lymph node involvement, which means that surgical treatment can be confined to excision of the local disease. When microinvasive disease is confined to lesions 3 mm or less in depth and 7 mm or less in width (stage *Ia1*), *a cone biopsy is usually sufficient to ensure adequate treatment, especially when a woman desires to conserve her fertility.* But for women who fertility is not a consideration, hysterectomy may be advised after frank invasion has been excluded. If invasion extends beyond 3 mm or is more than 7 mm wide, radical hysterectomy and pelvic lymphadenectomy (also known as wertheim’s hysterectomy) is the standard surgical management.

A study of 476 women with stage Ia disease reported 10-year recurrence rates for *Ia1* and *Ia2* of 3.2% and 3.9% respectively and death rates of 1.9% and 1.3% respectively. Only one out of 115 patients treated with cone biopsy died of cervical cancer (45). Multivariate analysis showed that both conservative hysterectomy and the omission of lymphadenectomy were associated with higher recurrence rates among the women whose tumours invaded more than 3 mm.

2.2.5.6 MANAGEMENT OF MACROINVASIVE DISEASE

The definitive treatment for carcinoma of the cervix may involve either surgery or radiotherapy or a combination of both, although this depends on certain principles of

management developed in each unit. Each patient should be staged and discussed jointly. In many centres surgery is performed on the younger patient with lower-volume stage Ib disease, while radiotherapy is used for older and less fit patients, regardless of the size of the tumour, for women with bulky stage Ib and IIa tumours or for more advanced disease. Radical hysterectomy and pelvic lymphadenectomy is the surgical approach to management of cervical cancer stage Ib. The procedure commences with lymphadenectomy, which is followed by radical resection of the uterus, cervix and upper third of the vagina together with the related parametrial and uterosacral tissues.

Of those women treated surgically whose lymph nodes are positive, at least 65% survive (25). Studies have shown that postoperative radiotherapy in women with positive lymph node sampling does not improve prognosis (46, 47), their survival can be attributed only to the complete surgical resection of metastatic disease. This is why some believe that lymphadenectomy can be therapeutic while others regard it only as a means of staging and refining the prognosis.

The overall 5-year survival rate after surgery for stage Ib cervical carcinoma is around 90% (48). For node-negative patients it is 91% and for node-positive women 66%. For stage Ib1 cancers (<4 cm in diameter), the cure rate for radical hysterectomy is of the order of 90% (49). With Ib2 tumours, the cure rate falls around 70% principally because of higher rates of pelvic or para-aortic lymph node metastases. While surgery and radiotherapy produce equally good cure rates in the treatment of stage Ib tumours, there is an increase in major long-term complications such as bladder dysfunction, lymphoedema and bowel problems when postoperative radiation is given (49).

Because postoperative radiotherapy is required in around 80% of women with stage Ib2 tumours, these bulky tumours are being managed increasingly with chemoradiation (49).

The role of surgery may extend to the removal of the bladder or rectum or both en bloc with the uterus and vaginal. This is called exenteration. The principle indication is to treat central recurrence, usually following primary radiotherapy. Such surgery goes with risks not only morbidity and death but significant psychosexual problems afterwards.

Radiotherapy for carcinoma of the cervix is usually given by a combination of external beam and intracavitary irradiation, patients with small-volume stage I tumours requiring intracavitary treatment alone while more advanced disease are treated with a combination of intracavitary dose and external beam therapy. However, the choice of treatment should be individualised as some cases may tolerate poorly external beam therapy, e.g. patients who have inflammatory bowel disease, diabetes, previous endometriosis, surgical adhesions, just to mention a few.

Late complications are related to dose, fraction size and intracavitary dose rate, and may be influenced by pre-existing medical problems that reduce pelvic radiotolerance (50). Depending on technique, some 1-10% of patients develop long-term problems, which are usually related to the small or large bowel (subacute obstruction, diarrhoea) but may involve the urinary tract (haematuria) (51). Vesicovaginal fistulae will occasionally occur in patients who have been treated entirely appropriately.

The combination of neoadjuvant chemotherapy and radiotherapy has not resulted in improved survival, as a good response to chemotherapy seems to occur only in women who also respond well to radiotherapy (52). A meta-analysis including a negative study from Canada still shows a small, statistically significant benefit for the addition of cisplatin to radiation (53). It is possible that this may change the practice in most centres.

Management of carcinoma of the cervix in pregnancy depends on the stage at diagnosis, the gestational age and the wishes and beliefs of the patient and her partner. When fetal survival is desired, delivery should be delayed until the fetus is mature rather than just potentially viable. The prognosis does not seem to be affected adversely by the pregnancy in women with early-stage disease (54). For stage I, the management in first trimester is Wertheim's hysterectomy; in second trimester, termination of pregnancy by hysterotomy is followed by Wertheim's hysterectomy; while in third trimester, caesarean at 34 weeks and then Wertheim's hysterectomy is advocated. For stages II-IV, in first trimester vaginal termination and radiation is preferred; second trimester, prostaglandin termination is followed by radiotherapy; while in third trimester, caesarean at 34 weeks and radiotherapy after 10 days is advisable.

Invasive carcinoma may be found after hysterectomy for presumed preinvasive disease or when cervical pathology was not suspected. If the patient was carefully evaluated before surgery and the invasive lesion was a small Ib tumour, the prognosis is good (55). In studies where the outcome is poor, it is likely that the original lesion extended outside the cervix (56, 57). A 5-year survival of 80% may be achieved with

wertheim's hysterectomy (57). Alternatively, radiation may be given, and provided the lesion was originally stage Ib, this offers a 5-year survival of 78%, similar to that of patients treated with an intact uterus (55).

The continuing follow-up of these patients is of great importance to evaluate results, provide assurance and to give symptomatic relief to those whose treatment has failed. It is recommended that there should be 3-monthly follow-up for 3 years, 6-monthly follow-up for 2 years and annual visits thereafter. Counselling and support should be provided throughout the patient's treatment and help her to cope with all aspects of readjustment, including prevention of the sexual problems that tend to develop in these women and their partners. Where indicated hormone replacement therapy should be provided, including younger patients who receive radiotherapy.

2.3 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN AFRICA

Studies have shown that cervical cancer is the commonest female malignancy in sub-Saharan Africa (58, 59, 60, 61, 62). This section will look at some studies from a few African countries as outlined below.

2.3.1 ZIMBABWE

A cross sectional survey was carried out at Mudzi District Hospital and all the 20 rural health centres in Mudzi District of Zimbabwe (63). The objectives were to assess knowledge, beliefs and screening behaviours on cervical cancer among 60 health workers. Only 50% of the respondents knew of the Pap smear as a screening method for cervical cancer. 86.6% did not know the HPV screening and 90% did not know of

the VIA. Knowledge was very low for treatment options for pre-cancer and all the health workers did not know the LEEP and laser options. The majority 73.3% believed that they were not at risk of developing cervical cancer and most of the respondents 81.7% had not undergone any form of cervical cancer screening.

2.3.2 BOTSWANA

Cervical cancer is the most common cancer in Botswana (64). A study to explore knowledge and beliefs of 30 women about cervical cancer and Pap smear tests was conducted and recruitment was done from all income levels using network sampling (64). This study revealed that the knowledge of cervical cancer and the Pap smear test was inadequate among women with low incomes. Pap smear utilization was also found to be limited among low-income women. Of the 18 women who had had at least one Pap smear in their lifetime, 44% had opportunistic testing as a result of having gynaecological symptoms. 40% had never had a Pap smear test. The major barrier to Pap smear screening included inadequate knowledge about Pap smear testing, providers' negative attitudes, and limited access to doctors.

2.3.3 SOUTH AFRICA

A study conducted recently in South Africa has shown that mere provision of cervical cancer screening services is not sufficient to ensure successful Pap smear uptake because screening is a multifaceted entity (65). In this study, women from different socioeconomic backgrounds were assessed by means of a questionnaire on knowledge and use of cervical cancer screening in Durban, Kwazulu Natal.

Despite most patients residing within a 12-kilometer radius of a facility that either provided or could potentially provide screening, results showed that the majority of women from lower socioeconomic circumstances with multiple risk factors were not aware of cervical screening or facilities available for this purpose. However, in spite of knowledge of cervical screening and availability of such services, 87% of women from higher social and educational backgrounds did not undergo cervical screening. Only 27.3% reported having had a Pap test. This was due to failure on the part of the healthcare giver to disseminate information regarding the reason and value of cervical screening. Therefore this study concluded that improvement of socioeconomic and educational circumstances should improve the uptake of a screening program only if the health care giver provides appropriate information to women and the women take initiative to avail themselves of such screening.

In a separate recent study, two groups of randomly selected women of African decent in a rural and urban area were interviewed using a structured questionnaire to assess their knowledge and attitudes regarding breast and cervical cancer and screening options (66). Almost one-fifth of women had not heard of these cancers. Generally lower awareness levels were found in older and rural women who were also inclined to consult traditional healers (than doctors) about lumps in their breast or abnormal bleeding. More than half were unaware of tests for cervical cancer. The results revealed a need to pay particular focus on rural women in order to empower them with knowledge about their health and illness prevention options, considering the inadequate health care resources in their communities.

2.3.4 KENYA

A Kenyan study has shown that the level of knowledge is low among patients with invasive cervical cancer and noncancer patients at Kenyatta National Hospital in Nairobi (67). *The objective of this study was to assess knowledge and practice about cervical cancer using a structured questionnaire. 51% of the respondents were aware of cervical cancer while 32% knew about Pap smear testing. There were no significant differences in knowledge between cervical cancer and noncancer patients. Health care providers were the principal source of information about the Pap testing (82%). Only 22% of all the patients had had a Pap smear test in the past, and patients aware of cervical cancer were more likely to have had a Pap in the past.*

2.3.5 TANZANIA

A hospital based cross-sectional study has revealed that the level of knowledge of basic symptoms of cancer of the cervix is low among Tanzanian women at Muhimbili National Hospital in Dar es Salaam, which could contribute to women presenting to hospital with advanced disease among cancer patients (68). The study intended to determine the level of knowledge of basic symptoms of cervical cancer and to determine causes of late presentation with advanced disease among cancer patients.

89 cervical cancer patients and 178 controls were interviewed using a structured questionnaire. The mean age of case was 48.8 years and mean parity was 6.7 years which were comparable to that of control, 45 years and mean parity 6.6 respectively. The mean age in years at marriage was lower for cases (17.2) than controls (18.8). The majority of both cases (47.2%) and control (56.7%) had no routine

gynaecological examination and they did not find it necessary. The results showed that more than 90% of the cases were in advanced stages of the disease (stage IIb-IV).

2.3.6 NIGERIA

A study aimed at finding out the level of awareness about cervical cancer and level of utilization of preventive measures among female health workers at 3 hospitals in Ibadan, has shown low uptake of Pap smear test among health workers (69). A total of 205 female doctors, nurses and hospital maids were interviewed using a questionnaire. Knowledge about cervical cancer was high among doctors, surprisingly inadequate among nurses and predictably poor among hospital maids. The results showed that 93.2% of the respondents had never had a Pap smear performed, and that the poor utilization of the test was independent of the respondent's profession, marital status or hospital.

2.3.7 GHANA

At the Korle-Bu Teaching hospital in Accra, 64% of gynaecological cancers between 1995 and 1997 were cervical cancer (70). A cross-sectional study was carried out, using self administered questionnaires, among four different groups of well-educated women at the University of Ghana main and medical campuses. These groups were medical students, nonmedical undergraduate students, nurses and senior university workers. The study aimed at determining the level of knowledge about cervical cancer and Pap smear, assessing the level of Pap smear use, and identifying the factors that promote cervical cancer awareness and Pap smear use. 175 women were recruited.

The results of this study showed that 93% of respondents had heard of cervical cancer, but only 37% had adequate knowledge about the disease (70). Of those with adequate knowledge, nurses and medical students were significantly in the majority. Regarding etiological factors 41% mentioned multiple sexual partners, 36% thought that vaginal douching and insertion of substances into the vagina increased the risk of cervical cancer, while 23% had no idea about the etiological factors for cancer. Only 15 respondents (8.5%) had ever had a Pap smear done, and of these 10 (66.7%) had adequate knowledge of cervical cancer. Of the 15 respondents who had had a Pap smear done, 7 (53.3%) did so because a doctor asked for it as part of their management, 2 (13.3%) had the test as part of routine checkup, and 3 (20%) asked for the test to be done after receiving some education about cervical cancer.

Of the 67 respondents who stated that they had never had a Pap smear done, 19.4% considered the Pap smear as not necessary, 16.4% had never heard of Pap smear, and 2.8% did not know where to have the test done. This study concluded that the level of Pap smear use among well-educated women in the west African city of Accra is very low despite the higher level of knowledge about cervical cancer and Pap smear when compared with women in other African cities.

2.4 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN LATIN AMERICA

A study was conducted among low-income women in Venezuela, Ecuador, Mexico, El Salvador and Peru to identify barriers and benefits of cervical cancer screening. The main barriers identified by all participants were accessibility and availability of quality services, facilities that lack comfort and privacy, and courtesy of providers, which interact with poor service delivery (71). Some of the barriers identified that

pertain to women's beliefs were anxiety borne by women awaiting results, associated negligence and fear of cancer. The benefits of screening were a peace of mind and being in control of their health. These results were found to be consistent with other findings from other studies conducted in developed and developing countries.

2.4.1 MEXICO

The national mortality rate due to cervical cancer was estimated at 21.8 per 100,000 among women over 15 years in 1994 (72). A recent pilot study has suggested that compliance with cervical cancer screening would be enhanced by addressing cultural beliefs, encouraging conversations about women's health issues, and increasing the number of female health care providers (72). In this same study, 97 rural women were interviewed to find out about factors that may influence cervical cancer screening among rural Mexican women.

Results showed that 52% of respondents had not received a Pap smear within the last 2 years, while 62% had never received a Pap smear before. The most frequent reason for not obtaining a Pap smear was anxiety regarding physical privacy (50%) and less frequent were lack of knowledge (18%) and difficulties accessing health care (14%). Women who had delivered children were significantly more likely to have received a Pap smear (71%) than women who had no children (10%).

A separate cross-sectional Mexican study was conducted to identify and evaluate the predisposing factors regarding the utilization of Pap smear in the population seen in the cervical cancer screening program in Mexico. The results showed that the predisposing factors were knowledge about Pap smear's benefits, history of using at

least two birth control methods, previous history of vaginal infection, and sexual partner's approval of gynecological examinations (73). The conclusion of this study was the need to strengthen health promotion programs to women at high risk of cervical cancer and their sexual partners, and to include benefits of screening tests in their educational programs on cancer prevention.

2.4.2 NICARAGUA

A population-based study was conducted in Rivas to obtain baseline information for designing a community-based intervention program aimed at increasing the cervical cancer screening coverage of women most at risk. A questionnaire was designed to elicit knowledge; attitudes, and practices concerning sexual and reproductive health and behaviour; risk factors for cervical cancer; and the use of health and cervical cancer screening services. 634 women and 612 men participated in this study.

Results reviewed that only 68.3% of women and 56.9% of men respondents said they knew some basic facts about cancer, and yet 94% and 89.2% respectively, knew that women could be examined to detect the illness (74). Of the women interviewed 19.6% and 14% of men could give at least one symptom of cervical cancer. Symptoms most cited were abdominal pains (13.2%), bleeding (9.1%) and vaginal discharge (2.6%). In general, people were favourably inclined towards screening, 89% of men and 80.3% of women thought that it was good for women to be screened.

Nearly 80% of both sexes considered the medical doctor best placed to perform the screening and significantly more women than men preferred a female health worker (70.3% vs. 38.5%). For 25% of men and 56.4% of women the screening should

preferably be offered through private services, but one quarter of men and 37.2% of women were not able or willing to pay for a Pap smear.

Of the women screened, 41.9% had never been screened and 17% had had their Pap smear more than 3 years ago. The reasons given for not being screened were negligence (23.6%), absence of medical problems (22.1%), fear of the examination (21.1%), ignorance (15.1%) and economic reasons (8%). Less than 10% declared they had been willing to undergo screening tests. This study provided useful information for the design of a screening program adapted to the needs of the population, as their current screening program was found not to be effective in reaching the majority of the population. It recommended complimentary activities such as education and information, as well as a more pro-active approach to invite women for screening.

2.5 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN NORTH AMERICA

Cervical cancer screening is not fully utilized among all groups of women in the United States, especially women without access to health care and older women (75). Analyses of the 2000 National health Interview Survey showed that among women who had not had a hysterectomy, 83% reported having had a Pap test within the past 3 years (75). Characteristics which were associated with lower rates of Pap test use included lacking a usual source of care, low family income, low educational attainment, and being unmarried. Despite higher insurance coverage, being age 65 and older was associated with low use. It was concluded that policies to generalize insurance coverage and a usual source of health care would likely increase use of Pap

testing. Also needed are health system changes such as automated reminders to assist health care providers implement appropriate screening.

A recent study has concluded that Vietnamese women in the United States have a higher rate of cervical cancer and lower Pap test utilization than white women (76). This study was conducted to evaluate factors associated with awareness of the Pap test, intention to obtain it, and its receipt in Vietnamese-American women. Data on sociodemographics, healthcare system access and attitudes, as well as Pap test awareness, attitudes, intentions, and practices were collected from 1566 women living in Santa Clara County, California, and Harris County, Texas, using a telephone survey.

Results showed that 74% had heard of the Pap test, and 76% had had at least one test (76). Only 42% of those who never had a Pap test had considered obtaining one. There were significant differences between the two sites. For all women, younger age, being married, having requested a Pap test, physician recommendation, and preferring a women standby if the doctor was male were associated with Pap test intention. Being married, higher level of education, having a female doctor, having a respectful doctor, having requested for the test, and physician recommendation were associated with Pap test receipt.

A community-based survey of 472 Chinese American women living in Seattle has shown that there is a need for increased recognition of cervical cancer risk factors among Chinese American immigrants (77). Pap smear testing is less common in Chinese American immigrants than in the general population. This study assessed

knowledge of cervical cancer risk factors and history of Pap smear testing along with socioeconomic and acculturation characteristics.

Most cervical cancer risk factors were recognised by less than half of the participants. Factors independently associated with knowledge of cervical cancer risk factors included marital status, employment, and education. Respondents with the highest knowledge had greater odds of ever receiving a Pap smear, compared to those with lowest knowledge.

Another study was conducted to examine whether low-income Latina immigrants were less likely to receive a pap smear, as well as examine ethnic differences regarding cervical cancer knowledge, and the sociocultural factors associated with cervical cancer screening (78). 225 low-income women of reproductive age attending a Women, Infants and Children clinic were recruited in Birmingham, Alabama. 50% were Latina immigrants and 50% were non-Latinas.

Results from this study showed that Latina immigrants were less educated, less likely to have health insurance and more likely to be married or living with a partner than non-Latinas. All non-Latinas had a Pap smear in the past compared to 81.3% of Latina immigrants. Latina immigrants displayed significantly less knowledge regarding cervical cancer than non-Latinas, and also displayed culturally based knowledge and beliefs regarding cervical cancer screening that may influence getting a Pap smear.

A separate study has found suboptimal rates of screening for cervical cancer in a sample of young Hispanic women residing along the U.S.-Mexico border (79). In this study, beliefs, attitudes, and personal characteristics that correlated with self-reported cervical cancer screening history were examined among Hispanic women aged 18-25. Data was collected through a cross-sectional, face-to-face survey. The study questionnaire also included measures of acculturation, Pap test history, pregnancy and sexual history, use of birth control, type of medical insurance, and educational attainment.

Results showed that 69% reported ever having had a Pap test and 56% reported having had a test in the past year. 80% reported that they were sexually active, and of these, 63% reported using birth control. Respondents understood the seriousness of cervical cancer, their susceptibility to cervical cancer, and the benefits of Pap testing. However, only 61% agreed that most young women whom they know have Pap tests. The perception that the test would be painful and not knowing where to go for the test were negatively associated with ever having a Pap test.

Many Korean-American women are unaware of the importance of regular cervical cancer screening in the U.S. (80). A research was conducted to estimate rates and predictors of regular cervical cancer screening among 459 Korean-American women, through a face-face survey in Maryland, Baltimore. These women were recruited through Korean Churches and senior housing.

Only 39% of women had regular Pap smears (80). Regular Pap smear rates varied with age, with women 65 years and older least likely to have regular Pap smears. In

multiple logistic regressions, the strongest correlate of regular Pap smear was knowledge of guidelines. Physician recommendation, having health insurance, and having friends or family members receiving Pap smears were also important facilitators. Women with low levels of education and low English proficiency had lower rates of Pap smears than those who had a high level of education and high proficiency. The most frequently given reason for lack of a regular Pap smear was a belief that screening was unnecessary if a woman had no symptoms of cervical cancer. This study concluded that strategies for education on screening guidelines, along with physician referrals, should be implemented, and that culturally appropriate educational programs about cervical cancer screening should be developed for less educated and less acculturated immigrant women.

2.6 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN CANADA

Chinese Canadian women have higher cervical cancer incidence and lower Pap testing rates than the general Canadian population (81). Predisposing, enabling and reinforcing factors associated with ever having a Pap test, and having a recent Pap test within the last 2 years, were assessed among Chinese women in British Columbia. 512 women between the ages of 20 and 79 years were interviewed about Pap testing, health care, traditional health beliefs, acculturation and sociodemographic characteristics. Two analyses were done, comparing women who had ever had and never had a Pap test, and comparing women who had and not had received a recent Pap test.

76% reported ever having a Pap test and 57% reported having a Pap test within the last 2 years (81). Traditional health beliefs were not associated with ever or recent Pap testing. However, belief that Pap testing prevented cancer and general knowledge about the Pap test were associated with screening. Concern about pain or discomfort with the test, availability of time, culturally sensitive health care services and recommendation for Pap testing by a physician were also associated with screening. This study recommended continuing education about Pap testing for physicians serving underscreened Chinese women, and provision of culturally and linguistically appropriate educational materials.

2.7 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN SWEDEN

A Swedish study was conducted to investigate knowledge about and attitudes to gynecological Pap smear screening among Swedish women where a screening programme has been in existence since 1970 (82). Questionnaires were mailed to a random sample of 400 women. Replies were received from 275 of the 392 available for evaluation.

95% of the responders had a registered Pap smear in the pathology database. 95% stated that they knew the purpose of screening but only 62% could indicate which type of cancer the screening actually examined. The majority (82%) did not experience anxiety while awaiting the test results. Almost all women knew that dysplasia may not give symptoms but 10% did not consider seeking a doctor when experiencing postcoital bleeding. 50% thought that their life-style may be of importance for developing dysplasia but only 13% were aware of the protective effect

of a condom. Although the vast majority of women had experience of participating in the screening program, one in three of the women were unaware of which type of cancer she was being screened for and only half of the women were aware of the connection between dysplasia/cervical cancer and life-style factors. This study recommended provision of better information about life-style factors in order to give women the opportunity of acting accordingly.

2.8 CERVICAL CANCER AND PAP SMEAR SCREENING KNOWLEDGE AND PRACTICES IN CHINA

Despite the provision of cervical cancer screening programs, women's attendance for cervical cancer screening remains low at 59% in China (83). A recent Chinese study has demonstrated that there is need for further knowledge about the preventive nature of cervical screening and regular screening (83). The study was undertaken to investigate the level of knowledge about cervical cancer and cervical screening among a population of Hong Kong Chinese women. 242 responded to a confidential questionnaire.

A total of 135 (57%) women had attended screening, with those who were married with children significantly more likely to attend. Although no significant difference was found between the overall level of knowledge of attendees and nonattendees, individual items such as women's knowledge of risk factors were significant. Other factors influencing Chinese women's attendance patterns included advice from practitioners and the significance of children to women's propensity for self-care.

3. STUDY JUSTIFICATION

The incidence of cancer of the cervix is on the increase in Zambia, and many women who suffer from the disease present in late stage of the disease when not much help can be rendered to them by physicians. Despite having screening facilities in most government hospitals, it is thought that the uptake of Pap smear screening is low. No study has been done at UTH to assess the impact of knowledge and attitudes of cervical cancer and Pap smear screening among women.

The decision by the government of Zambia to set up a radiotherapy centre for treatment of cancer at UTH is plausible. However, in order to reduce cervical cancer morbidity and mortality among women in Zambia, there is need to create national screening programme for cervical cancer. The results obtained from this study can be disseminated and utilized in designing an intervention programme aimed at increasing cervical cancer screening coverage of women at risk in Zambia.

4. OBJECTIVES

4.1 MAIN OBJECTIVE

This study intends to determine the level of knowledge about cervical cancer and Pap smear among women who attend the antenatal and gynaecological clinic at UTH in Lusaka.

4.2 SPECIFIC OBJECTIVES

1. To determine the level of utilization of Pap smear.
2. To find out whether women consider Pap smear to be important
3. To determine whether women receive information on Pap smear from clinicians
4. To establish whether women attending the antenatal and gynaecological clinic are aware of the existence of Pap smear screening facilities at UTH.

5. STUDY HYPOTHESIS

1. Women with knowledge about cervical cancer are more likely to know about Pap smear screening than those without knowledge.
2. Women who have one or more children are more likely to know about cancer of the cervix and Pap smear benefits than women who do not have children.
3. Educational background is an important factor in the utilization of Pap smear screening services.
4. Women living in Lusaka urban are more likely to know about cancer of the cervix and Pap smear than women living in Lusaka rural.
5. Death of a close relative or friend from cervical cancer is likely to increase awareness of symptoms of cervical cancer.

6. METHODOLOGY

6.1 STUDY DESIGN

A cross sectional study was conducted on women aged 18 years and above, who attended antenatal and gynaecological clinic at the UTH from October 2003 to April 2004. A structured questionnaire was used to obtain information from women as they came for their antenatal or gynaecological appointments. Information collected from women included questions on demographic data, knowledge about cancer of the cervix, knowledge about Pap smear, and utilization of Pap smear (see questionnaire in appendix 1).

6.2 STUDY SETTING

The study was carried out in the antenatal and gynaecological clinic at UTH. UTH in Lusaka is the largest hospital in the country, with a bed capacity of 1,800 and serves as a referral centre for patients from all over the country. It is also a teaching centre for various health professions, including undergraduate and postgraduate medical students, nurses, midwives and paramedicals.

UTH has a cancer ward for women located in the Department of Obstetrics and Gynaecology with a bed capacity of 24. The majority of these women have cancer of the cervix. There is a cytology laboratory within the department which is managed by an experienced cytologist who has worked for over 20 years. Cervical cancer cases are referred to UTH from all over the country for management.

6.3 STUDY SAMPLE

This study targeted a sample of 1188 women. On average, the daily flow of patients for the antenatal and gynaecology clinics at UTH is 40 and 25 respectively. 738 women were targeted for recruitment from the antenatal clinic and 450 women from the gynaecological clinic, representing 62% and 38% respectively. The study adopted a 1 in 4 systematic random sampling.

6.4 INCLUSION CRITERIA

1. Sexually active women aged 18 years and above.
2. Women with any obstetric or gynaecological problem
3. Resident of Lusaka Province

6.5 EXCLUSION CRITERIA

1. Below age 18 years
2. Non resident of Lusaka Province

6.6 DATA COLLECTION CRITERIA

The data collection was done for a period of six months, running from October 2003 up to April 2004. Interviews were conducted for three days on a weekly basis from Tuesday to Thursday. Two qualified midwives who are fluent in more than 4 vernacular languages were recruited as research assistants to conduct interviews. The research assistants went through all the questions with the clients, and the answers given by clients were entered in the data sheets. The filling in of answers was done by the research assistants in the presence of the clients, in order to maintain uniformity and consistency because not everybody was conversant with English or all questions.

Translation into vernacular language was made by research assistants for clients who were not conversant with English. Only one questionnaire was completed per client.

6.7 DATA MANAGEMENT

6.7.1 FIELD EDITING OF QUESTIONNAIRES

Questionnaires were collected at the end of the clinic on a daily basis. The questionnaires were then numbered and checked for completeness, to make sure that the data were correctly entered.

6.7.2 DATA ENTRY AND EDITING IN EPI INFO

Data were entered into EPI Info. Range check and consistency check were used to edit the data after it was entered into EPI Info.

6.8 DATA ANALYSIS

The data were exported from EPI Info to SPSS for analysis. Data were presented in univariate, bivariate and multivariate forms for analysis. The 2 x 2 contingency tables also allowed calculation of the odds ratio (OR) and the 95% confidence interval (95%CI). The Yate's corrected chi-squared test was used to determine association between exposure factor and the outcome. All significant factors in bivariate analyses were used in a logistic regression model in order to adjust for confounding factors. The cut off point for statistical significance was set at 5%.

6.9 ETHICAL CONSIDERATION

Permission was sort from the Ethics Committee of the University of Zambia prior to commencement of this study. The rights of the patients were respected and upheld.

The recruitment of clients was considered after obtaining consent from interested clients. No patient was coerced into participating in the study and it was made clear that refusal to participate would not infringe on the patients' right to continue receiving appropriate medical attention at UTH. All information was kept as confidential as possible and would in no way be used for other purposes.

7. RESULTS

Table 3. Distribution of the interviewees by marital status, parity, residence and

7.1 SAMPLE DESCRIPTION

Out of the possible 1188 target sample, 1059 women agreed to be interviewed, representing a response rate of 89%. Figure 1 and Table 5 show the distributions of the sociodemographic factors. About half (49.9%) of the respondents were of the age 21-30 years. Most (82.8%) of the respondents were married and about two thirds (63.0%) of them were of parity 1-5. The majority of the respondents were from urban areas.

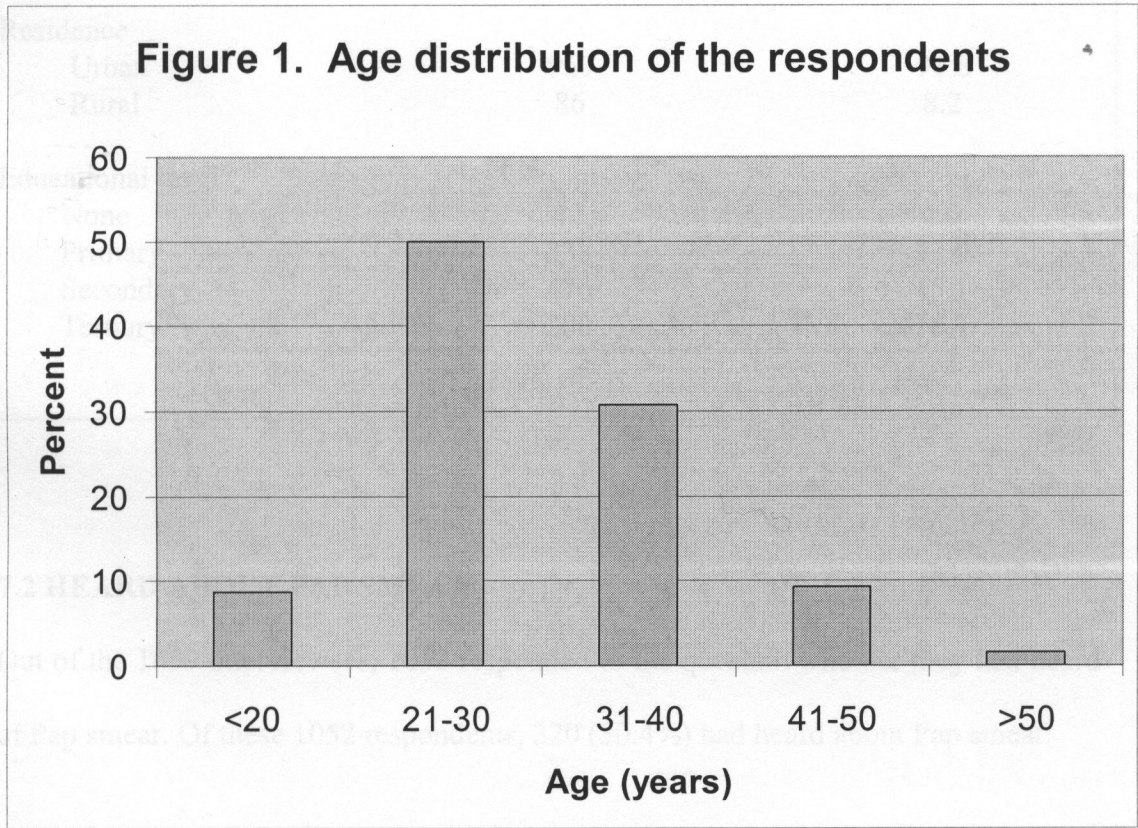


Table 5. Distributions of the interviewees by marital status, parity, residence and educational level

Factor	Frequency	Percent
Marital status		
Single	114	10.8
Married	877	82.8
Divorced	33	3.1
Widowed	35	3.3
Parity		
0	274	25.9
1-5	666	63.0
>5	117	11.1
Residence		
Urban	969	91.8
Rural	86	8.2
Educational level		
None	42	4.0
Primary	338	32.0
Secondary	476	45.1
Tertiary	200	18.9

7.2 HEARD ABOUT PAP SMEAR

Out of the 1059 interviewees, 1052 responded to the question whether they had heard of Pap smear. Of these 1052 respondents, 320 (30.4%) had heard about Pap smear.

7.3 IMPORTANCE OF PAP SMEAR

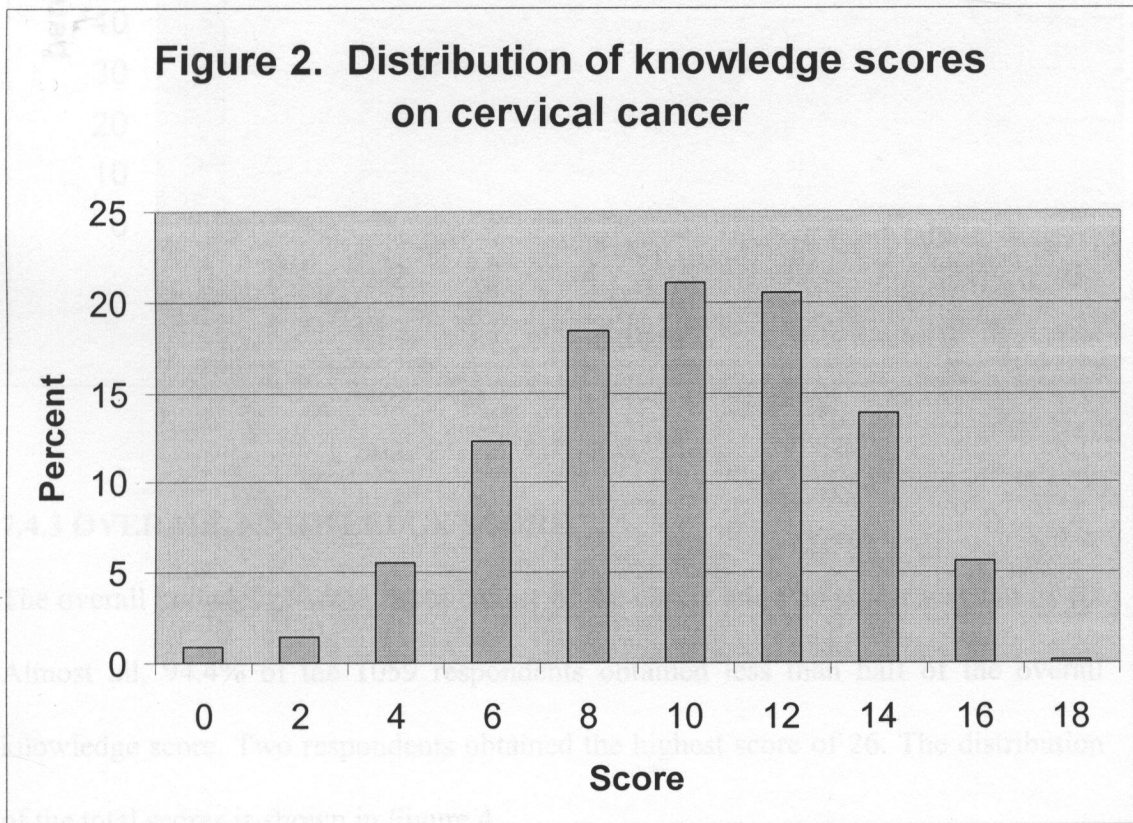
When asked about the importance of Pap smear, 151 (47.2%) of the 320 who had heard about Pap smear replied yes, 2 (0.6%) said no, and 167 (52.2%) did not know about its importance.

7.4 KNOWLEDGE OF CERVICAL CANCER AND PAP SMEAR

Sections B and C of the questionnaire (Appendix 1) ask questions on the knowledge about cancer of the cervix and Pap smear.

7.4.1 KNOWLEDGE ABOUT CERVICAL CANCER

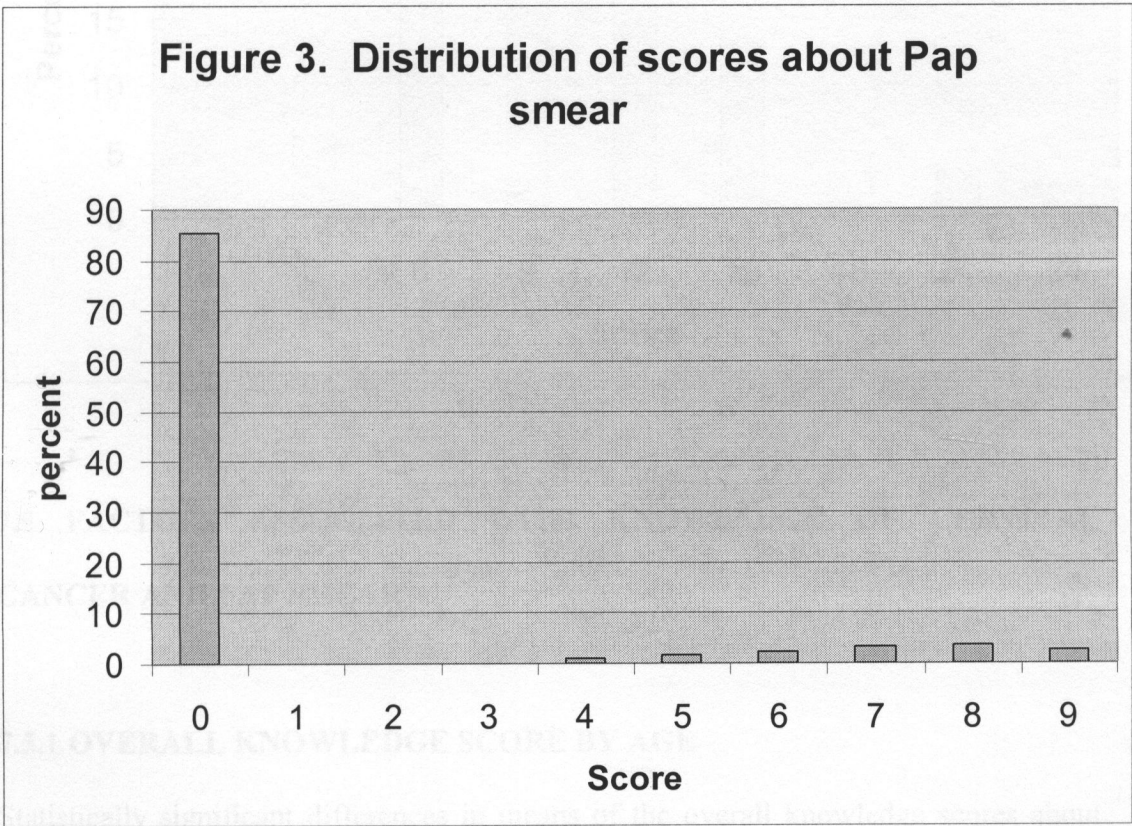
The respondents were scored out of 27. Most (80.3%) of the respondents scored less than half of the total score with the highest score being 18. Figure 2 shows the distribution of the scores.



Note: Classes are named by their lower limits of their class intervals: 0 = 0-1, 2 = 2-3, 4 = 4-5, e.t.c.

7.4.2 KNOWLEDGE ABOUT PAP SMEAR

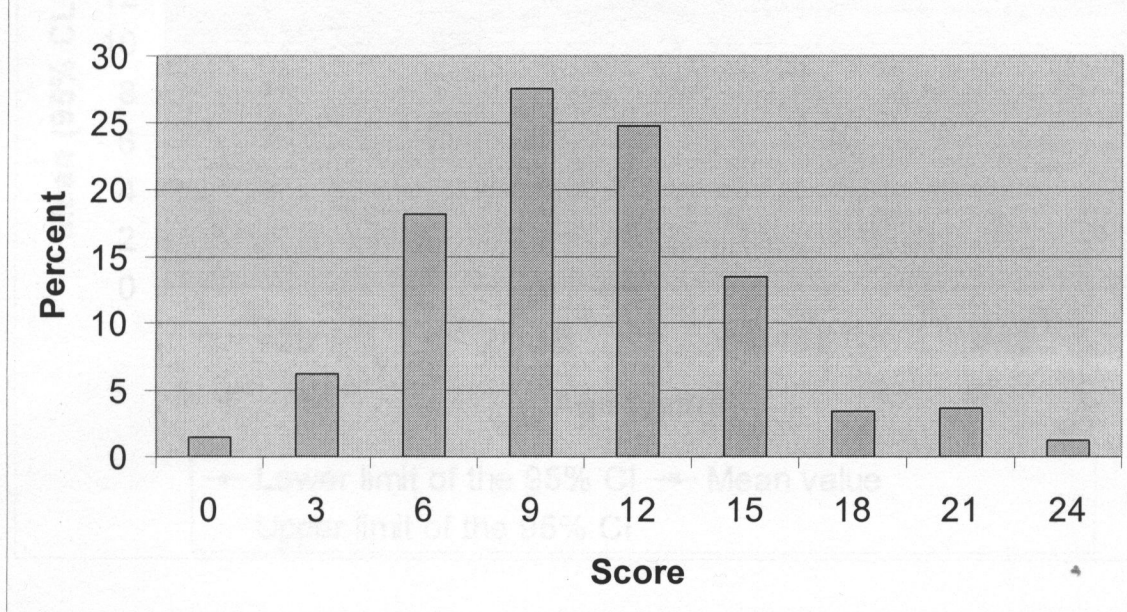
Out of 1059, 148 (14.0%) respondents indicated that they knew what a Pap smear is. A total possible score for knowledge items about Pap smear was 13. Altogether, 905 (85.5%) respondents had absolutely no knowledge about Pap smear. Only 102 (9.6%) respondents scored more than half of the total score, with the highest score being 9. Figure 3 shows the distribution of scores about Pap smear.



7.4.3 OVERALL KNOWLEDGE SCORE

The overall knowledge score about cancer of the cervix and Pap smear was out of 40. Almost all, 94.4% of the 1059 respondents obtained less than half of the overall knowledge score. Two respondents obtained the highest score of 26. The distribution of the total scores is shown in Figure 4.

Figure 4. Distribution of the overall scores of knowledge about cancer of the cervix and Pap smear

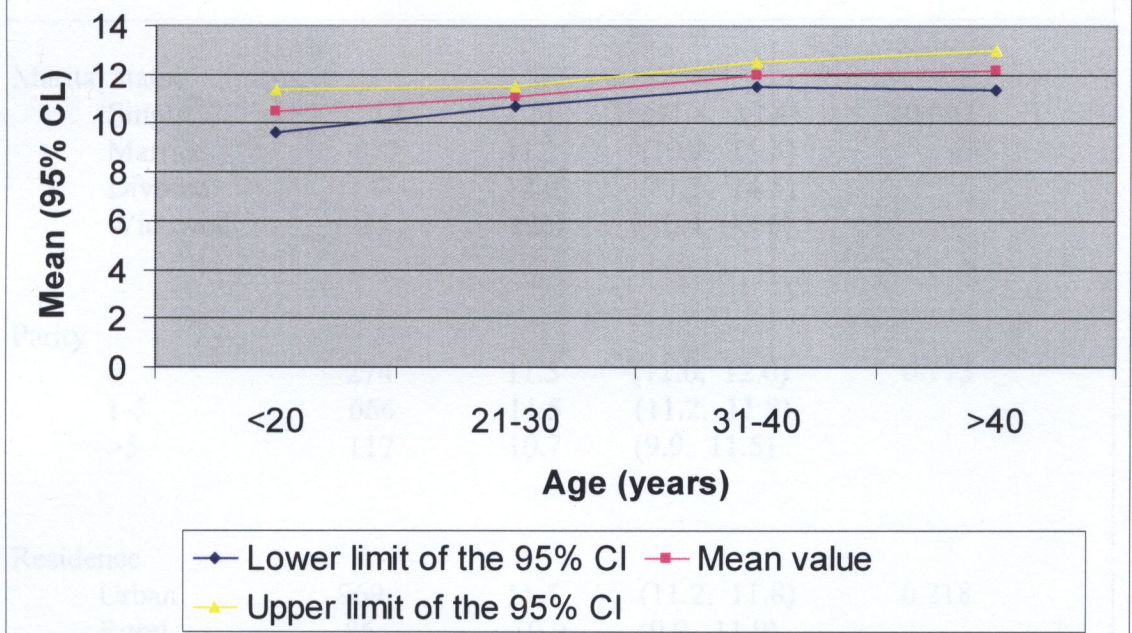


7.5 FACTORS ASSOCIATED WITH KNOWLEDGE OF CERVICAL CANCER AND PAP SMEAR

7.5.1 OVERALL KNOWLEDGE SCORE BY AGE

Statistically significant differences in means of the overall knowledge scores about cervical cancer and Pap smear were observed among the age groups ($p = 0.002$). A plot of the means of the scores is shown in Figure 5. The mean overall knowledge increased with age ($p < 0.05$)

Figure 5. Mean overall knowledge scores by age



7.5.2 OVERALL KNOWLEDGE BY MARITAL STATUS, PARITY AND RESIDENCE

The distributions of the overall knowledge scores by marital status, parity and residence are shown in Table 6. Mean scores were significantly different among classes of marital status ($p = 0.003$). Married respondents had the lowest mean score. No significant differences in mean scores were observed among non-married respondents ($p = 0.715$). Furthermore, no significant differences in mean scores were observed among parity levels ($p = 0.173$) nor between urban and rural residence ($p = 0.218$).

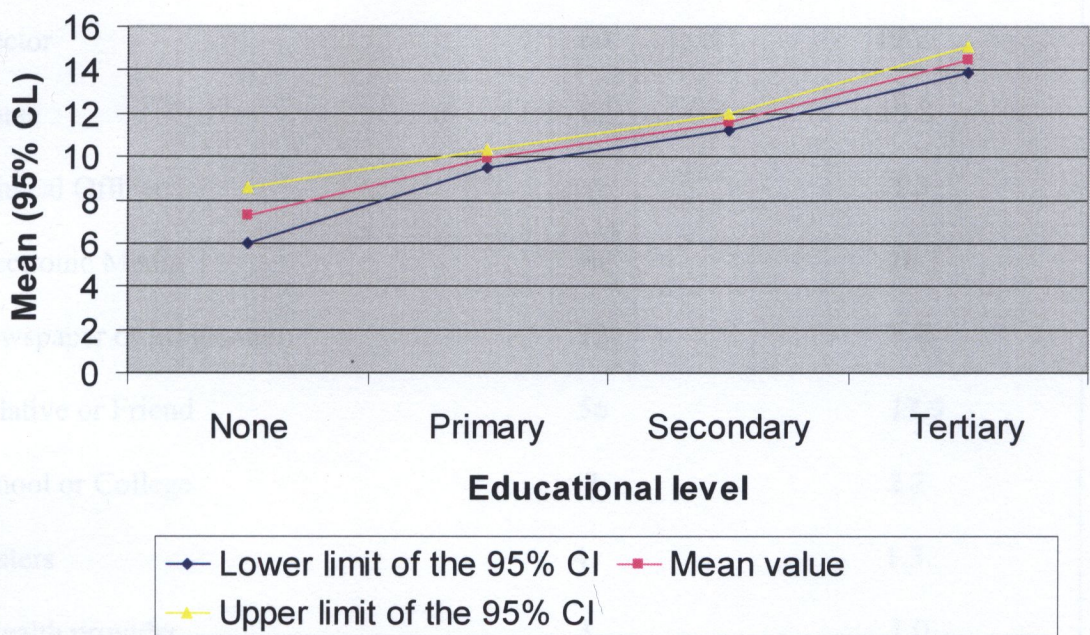
Table 6. Overall knowledge score by marital status, parity and residence

Factor	n	Score		p value
		mean	(95% CI)	
Marital status				
Single	114	12.6	(11.8, 13.4)	0.003
Married	877	11.2	(10.9, 11.5)	
Divorce	33	12.9	(11.3, 14.5)	
Widowed	35	12.0	(10.4, 13.6)	
Parity				
0	274	11.5	(11.0, 12.0)	0.173
1-5	666	11.5	(11.2, 11.8)	
>5	117	10.7	(9.9, 11.5)	
Residence				
Urban	969	11.5	(11.2, 11.8)	0.218
Rural	86	10.9	(9.9, 11.9)	

7.5.3 OVERALL KNOWLEDGE SCORE BY EDUCATIONAL LEVEL

Means of overall knowledge score differed significantly among educational levels ($p < 0.001$). Figure 6 shows the changes in mean scores by level of education. The mean score increased significantly with educational level ($p < 0.001$).

Figure 6. Mean overall knowledge scores by educational level



7.6 SOURCES OF INFORMATION ABOUT PAP SMEAR

The most common source of information about Pap smear was the electronic media (28.1%), followed by Nurse (19.8%), Doctor (19.2%) and Friend/relative (17.9%) as shown in Table 7.

7.8 UTILIZATION OF PAP SMEAR

Out of 1039 respondents, 49 (4.6%) had had a Pap smear prior to the survey. Of the 49 respondents who had had a Pap smear, 47 of them indicated the frequency of which they obtained the test. About half (23/47 or 48.9%) stated that a Pap smear is

Table 7. Sources of information about Pap smear

Source	Frequency	Percent
Doctor	60	19.2
Nurse	62	19.8
Clinical Officer	4	1.3
Electronic Media	88	28.1
Newspaper or Magazine	22	7.0
Relative or Friend	56	17.9
School or College	7	2.2
Posters	4	1.3
*Health provider	3	1.0
Other	7	2.2

* Health provider not specified by respondents

7.7 AWARENESS OF EXISTENCE OF PAP SMEAR SREENING FACILITIES AT UTH

Only 86 (8.1%) of the 1059 respondents knew that Pap smear screening was available at UTH.

7.8 UTILIZATION OF PAP SMEAR

Out of 1059 respondents, 49 (4.6%) had had a Pap smear prior to the survey. Of the 49 respondents who had had a Pap smear, 47 of them indicated the frequency of which they obtained the test. About half (23/47 or 48.9%) stated that a Pap smear is

supposed to be obtained once a year, 5 (10.6%) stated every two years and 19 (40.4%) stated other frequencies.

Reasons for obtaining the test were given by 46 respondents (Table 8). The common reasons given were: wanted to know the status (23.9%), long periods (15.2%), cervix/uterus problems (8.7%) and for fun (8.7%).

Table 8. Reasons for having a Pap smear

Reason	Frequency	Percentage
Cervix/uterus problem	4	8.7
Was not having children	2	4.3
For fun	4	8.7
Wanted to know status	11	23.9
Long periods	7	15.2
IUD preparation	2	4.3
Abdominal pains	3	6.5
Pregnant	1	2.2
Obstetrical/Gynaecological problem	2	4.3
Spotting	1	2.2
Had strange vaginal discharge	2	4.3
Recommended after giving birth	1	2.2
Recommended by doctor	2	4.3
Itching vagina	2	4.3
Routine check up	2	4.3

7.9 FACTORS ASSOCIATED WITH HAVING HAD A PAP SMEAR

The following factors were considered in the analysis of factors associated with having had a Pap smear: age, education, marital status, parity, residence, knowledge of cancer of the cervix, knowledge of Pap smear and the overall knowledge of cancer of the cervix and Pap smear.

Results of a multivariate analysis are shown in Table 9. Urban respondents were 2.50 (95% CI 1.04, 5.98) times more likely to have had a Pap smear compared to rural respondents. With every additional unit of knowledge, respondents were 8.7% more likely to have had a Pap smear (OR = 1.87, 95% CI 1.63, 2.15). Compared to respondents who were of age more than 50 years, respondents who were between 21 and 30 years were 72% less likely to have had a Pap smear (OR = 0.28, 95% CI 0.13, 0.63).

Table 9. Results of the multivariate analysis for factors associated with having had a Pap smear

Factor	OR	(95% CI)
Age (years)		
<20	0.39	(0.07, 2.25)
21-30	0.28	(0.13, 0.63)
31-40	0.84	(0.40, 1.76)
41-50	1.78	(0.71, 4.44)
>50	1	
Residence		
Urban	2.50	(1.04, 5.98)
Rural	1	
Knowledge of Pap smear	1.87	(1.63, 2.15)

7.10 INTENTION TO HAVE A PAP SMEAR

Out of 1010 clients who had had no Pap smear, only 106 (10.5%) had intentions of obtaining the test. When asked whether they would like to have a Pap smear, 94 (95.9%) out of 98 clients were affirmative. Out of the clients who wanted to have a Pap smear, 11 (11.7%) of them said yes today, 75 (79.8%) said yes some other times, and 8 (8.5%) said will think about it.

7.11 PREFERENCE FOR SEX OF A PRACTITIONER TO CONDUCT THE PROCEEDURE OF PAP SMEAR

Among the 100 clients who had had no Pap smear, 3 (3.0%) reported that they would prefer a male practitioner, 42 (42.0%) preferred a female practitioner and 55 (55.0%) had no preference for a practitioner who would do the procedure.

7.12 OBTAINING A TEST AFTER BEING TALKED TO

Less than half of the respondents (Table 10) talked to by the partners/friends/relatives (35.6%) and health care providers (40.7%) to obtain a Pap smear went on to take the test. No significant difference between these rates was observed ($p = 0.658$).

Table 10. Reasons for not taking the test despite being given advice to do so

Reason	Talked to by health worker Total = 38		Talked to by partners/ friends/relatives Total = 39	
	n	(%)	n	(%)
Not ready	23	(60.5)	22	(56.4)
Did not know where to get the test	4	(10.5)	5	(12.8)
Other	11	(28.9)	12	(30.8)

7.13 REASONS FOR NON UTILIZATION OF PAP SMEAR

When health workers and partners/friends/relatives suggested to the respondents about obtaining a Pap smear, 23 (60.5%) out of the 38 respondents talked to by health care providers and 22 (56.4%) out of the 39 respondents talked to by partners/friends/relatives indicated that they were not ready (Table 11).

Table 11. Person or incidence prompting clients to take a Pap smear

Person/incidence	Total	Obtained test	
		n	(%)
Partner/friend/relative	59	29	(35.6)
Health care provider	81	33	(40.7)
Death of close relative/friend due to cervical cancer	26	6	(23.1)

8. DISCUSSION

8.1 SUMMARY OF RESULTS

This study has explored the level of knowledge about cervical cancer and Pap smear, and the level of utilization of Pap smear among women who attended the Obstetrics and Gynaecology clinic at UTH over a 6 months period from October 2003 to April 2004. A total of 1059 women participated in the survey. Using SPSS for data analysis, we have established that the level of knowledge about cancer of the cervix is low among the women who were interviewed, with the majority of women (80.3%) scoring less than 50% of the total score (see Fig. 2).

The level of knowledge about Pap smear is equally low, only 9.6% of women scored more than 50% of the total score. 320 (30.4%) women had heard about Pap smear, and of these 151 (47.2%) agreed that the Pap smear is important. 148 (14.0%) respondents knew what a Pap smear is. The overall knowledge score about cancer of the cervix and Pap smear is low. Almost 94.1% of the 1059 respondents obtained less than 50% of the overall knowledge score (see Fig. 4).

We have also established that marital status can be an important factor in awareness of cervical cancer and Pap smear, as evidenced by significantly different mean scores on overall knowledge score among classes of marital status ($p = 0.003$), with the lowest mean score observed among the married respondents (see Table. 6). However, Parity and residence was not associated with cervical cancer and Pap smear awareness, as no significant differences in mean scores were observed among Parity level ($p = 0.173$) nor between rural and urban residence ($p = 0.218$). Furthermore, we have established that educational background is an important factor in awareness of

cervical cancer and Pap smear, as means of the overall knowledge score differed significantly among educational levels. The mean score increased significantly with increased educational level ($p < 0.001$) (see Fig 6).

Our study has also revealed that Clinicians (Doctors, Nurses and clinical officers) are the primary source of information about Pap smear, representing 40.3% as source of information (see Table. 7). This study has also shown that most women are not aware of the existence of Pap smear screening facilities at UTH, only 86 (8.1%) out of 1059 knew about its existence. We have established that very few women (4.6%) had a Pap smear prior to the survey. However, most women who had a Pap smear before did not know the frequency with which they are supposed to obtain the Pap smear. 49.9% had stated once a year, 10.6% every two years, and 40.4% stated other frequencies without specifying the period.

8.2 KNOWLEDGE ABOUT CERVICAL CANCER

To date, there is no evidence in the literature of any study that has looked at knowledge of cervical cancer among women in Zambia. It is obvious that women have little knowledge about cancer of the cervix as shown by the results obtained in this study, despite the fact that the majority of women in this study were from urban areas within Lusaka. Only 19.7% of the women managed to score above 50%, the highest individual score being 66%.

The results obtained from this study on low levels of knowledge about cervical cancer are comparable to results obtained from other studies conducted in Zimbabwe (63), Botswana (64) and Tanzania (68). However, in developed countries the level of

knowledge about cervical cancer is much higher than in poor resource nations like ours, as evidenced by one study that was carried out by Holroyd et al (2003) in Hong Kong, where the majority of women (78%) were knowledgeable about cervical cancer (84). Nonetheless, this is expected as developed countries have better medical facilities, national health educational programs and affordable health insurance facilities for majority of their women. Unfortunately this is not the case in Zambia and other developing countries.

There are exceptions in developing countries, like health workers who undoubtedly are more knowledgeable about cervical cancer. In the case of a study in Ghana, Adanu (2002) managed to show that medical students and nurses were much knowledgeable about cervical cancer than nonmedical undergraduate students and senior university workers (70). Before any conclusions are drawn from this analysis, it would be ideal to conduct a similar study among the health workers in Zambia, probably similar results would be obtained.

There is overwhelming evidence that lack of knowledge about cancer of the cervix contributes largely to the high mortality rates from cervical cancer in Zambia, as well as in other developing countries. A recent report from the National Cervical Cancer Coalition indicates that only 15% of women in Malawi seek help in early, treatable stages, where cervical cancer accounts for nearly 80% of female cancer (85). This may not be different from Zambia, where women are not aware of and do not have access to even the most basic, effective, low-cost treatment methods which prevent cells from progressing into invasive, and often fatal, cancer.

Indeed most women do not know about cervical cancer as a disease and many may not even know what a cervix is, especially in rural areas. As a matter of fact, most women in rural areas may prefer to consult traditional healers when faced with gynaecological or other health problems. If anything, most women in these areas seek medical help after unsuccessful attempts with traditional healers.

The study has shown that the low level of knowledge about cancer of the cervix was significantly correlated ($p < 0.001$) with a low level of formal education. Women with tertiary education were more likely to know about cancer of the cervix than women who had no formal education or those who only attained the level of primary education. Even then, we expected most of our women with formal education to know about cervical cancer, but this was not the case in our study.

The fact that the knowledge scores among the well educated were disappointingly low makes a point for increased public education of not only women but men as well about cervical cancer, if indeed we are to make a change. Gupta et al (2002) in their study found that South Asian women from a university setting had higher knowledge levels about cervical cancer than Tamil women selected from a community centre for South Asian women in Canada (86).

This is not surprising and was expected. In any given society, education forms a basic foundation for knowledge. In fact, the well-educated group is believed to have the greatest knowledge about cervical cancer and cervical cancer screening (60, 62). This study also found that increased age group of the respondents significantly correlated ($p = 0.002$) with higher level of knowledge about cervical cancer and Pap smear. The

older are more likely to know about cancer of the cervix and other reproductive health issues, because as a woman ages the number of reproductive health problems increase such as cancer risks, menstrual problems, use of contraception, and other gynaecological problems. Already results of the multivariate analysis of factors associated with having had a Pap smear has shown that respondents who were between the ages of 21 and 30 years were less likely to have had a Pap smear, compared to women who were of the age 50 years or more (OR = 0.28, 95% CI 0.13, 0.63). Probably age is an important factor in acquisition of health education.

8.3 KNOWLEDGE ABOUT PAP SMEAR

I find it logical to state that for somebody to have knowledge about Pap smear, one has to have some knowledge about cervical cancer. For one obvious reason; Pap smear is a screening test for cervical cancer, it therefore follows that one has to know the disease before knowing how it can be prevented or diagnosed. The results of this study support my statement. 9.6% scored more than 50% of the total score on level of knowledge about Pap smear, compared to 19.7% women who scored above 50% on knowledge about cervical cancer. 30.4% of women had heard about Pap smear and 14.0% knew what a Pap smear is.

The fact that the majority (85.5%) had absolutely no knowledge about Pap smear, speaks volumes of the dire need for campaigns and education on Pap smear awareness across the nation. The fact that there is no national program for cervical cancer screening in Zambia may just be one factor that may contribute to the low levels of knowledge on Pap smear obtained in our study. In countries with such programs, screening coverage of 80% is considered acceptable (87). Awareness is also a factor

in the low knowledge level about Pap smear. Other factors may be cultural beliefs, religious beliefs, accessibility to screening services, medical facilities and lack of qualified medical staff and cytologists in our hospitals. Our women who are experiencing many cervical cancer risk factors have virtually no access to education, screening and treatment. Many may not even know about their reproductive organs and reproductive health problems.

8.4 UTILIZATION OF PAP SMEAR

The number of women who had had a Pap smear prior to our survey is disappointingly low (4.6%) and this just emphasises the point why drastic measures should be taken to increase the screening coverage of our women in order to reduce morbidity and mortality from cervical cancer in Zambia. When compared to the figure of women who were knowledgeable about cervical cancer (19.7%), the figure of women who had had a Pap smear prior to the survey does not translate into an acceptable patronage of cervical cancer screening services at UTH, considering the fact that UTH is our main referral hospital in Zambia.

In our study, reasons given for having had a Pap smear were categorized as shown in Table 8. It is disappointing to note from this data that recommendation from medical personnel, as a reason for having had a Pap smear is low. This appears to show that medical personnel are less likely to recommend our women to go for a Pap smear. This is despite 40.7% of women who had heard about Pap smear, responded that they had obtained the information on Pap smear from health care providers. This could also explain why only 8.1% of the women in this study were aware of the availability of Pap smear screening services at UTH.

Our women folk need to be empowered with information on reproductive health matters, and there is no one who is better placed to do this than medical staff. Perhaps doctors, nurses and clinical officers need training in screening and treatment of women. The other observation in our study is a reasonably high number of women who stated that they obtained information about Pap smear through the media. Suffice here to mention that emphasis should be made on the use of electronic media for health education considering the fact that 28.1% of women obtained information about Pap smear through electronic media (see Table 7).

Else where in Africa, studies have produced different results of women who had had Pap smears prior to the surveys; Adanu (Ghana) 8.5% (70), Ayinde and Omigbodun (Nigeria) 6.8% (69), Gichangi et al (Kenya) 22% (67), Wellensiek et al (South Africa) 27.3%, McFarland (Botswana) 44% (64), and Tarwireyi et al (Zimbabwe) 18.3% (63). One observation made here is that the percentage of women who had Pap smear is lowest in our study when compared with the aforementioned studies, despite a comparable low level of knowledge about cervical cancer obtained in studies conducted in Zimbabwe, Tanzania and Botswana. However, it is difficult to draw any conclusions from this point of view. In developed countries the level of Pap smear use is higher as evidenced by two studies; Nguyen et al (USA) 76% (76) and Twinn et al (China) 57% (83).

Results of a multivariate analysis showed that women from urban areas of Lusaka were 2.50 (95% CI 1.04, 5.98) times more likely to have had a Pap smear compared to women from rural areas, taking into consideration different factors such as age,

education, parity, marital status, residence, and knowledge of cervical cancer and pap smear. Women in rural areas are disadvantaged in terms health information, health facilities and other socio-economical hardships. There is need to balance the provision of health services so that even the most vulnerable amongst rural women can have access to screening services.

8.5 STUDY LIMITATION

While the study sample was adequate for obtaining information for this study, the age distribution was not well represented. We had a lower number of respondents from the age group of 50 years and above. Ideally this age group represents a period of high risk for cervical cancer, when compared to age group 21- 30 years where we had the highest respondents. However, statistical significance was upheld in some instances.

8.6 FUTURE RESEARCH

It would be of interest to investigate the level of knowledge among rural women, and compare with results obtained in our study. Other areas of future research are to target health workers, college and university students, and non health workers in our communities, in order to establish common factors associated with Pap smear utilization. This would help develop national cervical cancer screening program for women in Zambia.

8.7 CONCLUSION

This study has provided evidence that the level of knowledge about cervical cancer and Pap smear is low among the women interviewed at UTH. It is likely that health care providers play very little role in influencing our women to obtain regular Pap smears. This study has also established that it is likely that women are not aware that *Pap smear screening services are available at UTH.*

The study has shown that there is need to focus on health education about cancer of the cervix and Pap smear. Women from rural areas need to be empowered with basic knowledge about cervical cancer risks, symptoms, screening and treatment options. There is also need to sensitise medical personnel on the importance of disseminating health information and promotion of Pap smears.

9. APPENDIX

9.1 QUESTIONNAIRE

DEMOGRAPHICS:

No.	Question	Data				
1.	Age:	<20	21-30	31-40	41-50	>50

2.	Marital Status:	Single	Married	Divorced	Widowed
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3.	Parity:	0	1-5	>5
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4.	Residence:	Urban	Rural
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KNOWLEDGE ABOUT CANCER OF THE CERVIX

1.	Some STDs, multiple sexual partners, early age at first intercourse, promiscuity and smoking are some of the risk factors associated with cancer of the cervix.	I agree	I don't agree	I don't know
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2.	Breastfeeding, multiple births, alcohol and miscarriages are not associated with the cause of cervical cancer.	I agree	I don't agree	I don't know
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3.	Is lack of hygiene one of the causes of cancer of the cervix?	Yes	No	I don't know
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4.	Is cancer of the cervix hereditary?	Yes	No	I don't know
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5.	Do you think that contraception is a risk factor for acquiring cancer of the cervix?	Yes	No	I don't know
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6.	Any woman who is sexually active is at risk of getting cancer.	I agree	I don't agree	I don't know
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7.	HIV positive women are at higher risk of getting cervical cancer than HIV negative women.	I agree	I don't agree	I don't know
----	---	---------	---------------	--------------

8.	Which of the following do you think are symptoms of cervical cancer? Please tick all those that apply.
	Abdominal mass Bleeding between periods Smelly vaginal discharge Delayed periods New bleeding after menopause Scanty periods Discomfort during intercourse Painful periods Swelling of legs

9.	Is cancer of the cervix a preventable disease?	Yes	No	I don't know
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10.	Cervical cancer is only curable in its early stage.	I agree	I don't agree	I don't know
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KNOWLEDGE ABOUT PAP SMEAR

1.A	Do you know what a Pap smear is?	Yes	No		
1.B	If 'Yes' how did you learn about it?	Doctor	Nurse	Clinical Officer	Other

2.	What is the purpose of the Pap smear? Explain in your own words.	
----	--	--

3.	Who should have a Pap smear? Please tick all those that apply.
	Sexually active women Girls between the ages of 10 – 15 years old Married women Men Women who have never had sex before Divorcee/widow Breastfeeding mothers Girls who have just started having their periods Women who have children

4.	When is it recommended to start Pap smear screening? Tick one that you think is the best answer.
	At first period (menarche) After giving birth After menopause Once a woman is sexually active

5.	How many times should a Pap smear be obtained in a woman's life?	Once	Twice	Several times	Other (specify)
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6.	Are painkillers or anaesthesia required when obtaining a Pap smear?	Yes	No	I don't know
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7.	How long should a Pap smear procedure take?	Few minutes	An hour	Few hours	I don't know
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8.	Where is the sample for Pap smear usually obtained from?	Vagina	Cervix	Inside the uterus (womb)	I don't know
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9.	Do you think that Pap smear is important?	Yes	No	I don't know
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10.A	Do you understand the significance of a positive cervical Pap smear?	Yes	No	I don't know
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10.B	If 'Yes' please explain in your own words.			
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UTILIZATION OF PAP SMEAR

1.A	Have you had a Pap smear before?	Yes	No	
1.B	If 'Yes' why did you have one?			
1.C	If 'Yes' how often do you obtain the test?	Once a year	Every 2 years	Other
1.D	When was the last time you obtained the test?			
1.E	If only once - why did you discontinue?			

1.F	If 'No' – Do you have any intention of obtaining the test?	Yes	No	
1.G	Would you like to have one	Yes	No	I don't know

2.A	Do you ever talk about cancer of the cervix or Pap smear with your partner, friends or relatives?	Yes	No
2.B	If 'Yes' has this discussion inspired you to obtain a Pap smear?	yes	No

3.A	Has your partner, friend or relative ever suggested that you obtain a Pap smear?	Yes	No
3.B	If 'Yes' did you obtain one?	Yes	No

4.A	Has any Health Care Provider recommended that you obtain a Pap smear?		Yes	No
4.B	If 'Yes' – Who suggested it?	Doctor	Nurse	Clinical Officer
4.C	If 'Yes' did you obtain one?		Yes	No

5.A.	Has any close relative/friend died of cervical cancer	Yes	No *
5.B	If 'Yes' was your awareness of cancer of the cervix increased?	Yes	No
5.C	If 'Yes' did this influence you in any way to obtain a Pap smear?	Yes	No
5.D	If 'Yes' did you obtain a Pap smear?	Yes	No

6.	If you were to do a Pap smear, who would you prefer to do the procedure?	Male practitioner	Female practitioner	Male or female practitioner
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7.	Do you know that Pap smear is available at UTH?	Yes	No	I don't know
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9.2 CONSENT FORM

CONSENT TO PARTICIPATE IN RESEARCH

INTRODUCTION

Dr Christopher Ng’andwe is a post-graduate student in the Department of Obstetrics and Gynaecology at UTH. He is conducting a study on Knowledge and Utilization of Pap smear among women attending the antenatal and gynaecological clinic at UTH. In this study his aim is to find out your knowledge on a screening procedure for cancer of the cervix called Pap smear. A questionnaire has been designed which you will be required to complete. Besides answering a few questions, no other procedure or test will be conducted on you.

VOLUNTARY PARTICIPATION AND RIGHTS

Your participation in this study is voluntary. Your consent to participate in this study will not result in violation of your rights. You have the right to refuse to participate or withdraw from the study whenever you wish. Regardless of whether you choose to participate or not, you will continue receiving appropriate standard medical care whenever you come to UTH.

CONFIDENTIALITY

All information collected will be confidential and will not be released without your permission or used for other purposes.

RISK AND HARM

There is no risk or harm to you if you decide to participate in this study. Some questions asked may be sensitive but you have the right to refuse to answer them.

BENEFITS

There is no direct benefit to you if you choose to participate in this study. However, information collected from this study may help to design a better screening programme for cervical cancer at UTH.

- 1. I have read and understood the information that has been read to me.
- 2. My questions have been answered to my satisfaction.
- 3. I do agree to participate in this study

_____ Name of Patient	_____ Signature/thumb print	_____ Date
_____ Name of researcher	_____ Signature/thumb print	_____ Date

N.B

In case of any questions or clarification please contact Dr Christopher Ng’andwe, Department of Obstetrics and Gynaecology, UTH P/B RW 1 LUSAKA
Phone 253947/097747097, E-mail: cngandwe@yahoo.com

10. REFERENCE

1. Ferley J, Bray F, Pisani P et al. GLOBOCAN. Cancer incidence, Mortality and Prevalence Worldwide, Version 1.0. Cancer Base No. 5. Lyon, IARCPress, 2001.
2. Parkin DM, Pisani P and Ferly J. Estimates of the worldwide incidence of 18 major cancers in 1985. *Int. J. Cancer.* 1993; 54: 594 – 606.
3. Pisani P. Cited in Preventing cancer in low resource settings. *Outlook* 1998;16:1
4. Sherris J, Preventing cancer in low resource settings. *Outlook* 1998; 16:1
5. Miller AB. Quality assurance in screening strategies. *Virus Res.* 2002 Nov; 89(2): 295 -299.
6. Evans MI, Krivchenia EL and Yaron Y. Screening. *Best Pract. Res. Clinical Obstet. Gynaecol.* 2002 Oct; 16(5): 645 -57.
7. Walton RJ. The Task Force on cervical cancer screening programs, editorial, *J. Can. Med. Assoc.* 1976; 114 – 81.
8. Worth A. The Warton report and its impact on cervical screening programs in Canada. *Obstet. Gynaecol.* 1984; 63: 135.

9. Anderson CH, Boyes DA, Benedet JL et al. 1988 Organization and results of the cervical cytology screening programme in British Columbia, 1955-85. *British Medical Journal* 296: 975 – 978.
10. Felix JC and Amezcua C. In vitro adjuncts to the Pap smear. *Obstet. Gynecol. North Am.* 2002 Dec; 29(4): 685 – 99.
11. MMWR Morb Mortal. Wkly Rep. Invasive cervical cancer among Hispanics and non-Hispanics women-United States, 1992-1999. 2002 Nov 29; 51(47): 1067-70.
12. Tay EH. Pap smear screening for cervical cancer in Singapore: issues to consider. *Singapore Med J.* 2004 Vol 45(6):244 -46.
13. Wain G, Hacker NF. Pitfalls in the screening and early diagnosis of cervical cancer. *Curr Opin Obstet Gynecol* 1990; 2: 74 -79.
14. Mubiayi N, Boaert E, Boman F, Leblanc E, Vinatier D, Leroy JL, Querleu D. Cytological history of 148 presenting with cervical cancer. *Gynecol Obstet Fertil.* 2002; 30: 210-17.
15. Spitzer M. In vitro conventional cytology historical strengths and current limitations. *Obstet. Gynecol Clin. North Am.* 2002 Dec; 29(4): 673-83.

16. Kesic VI, Soutter WP, Sulovic V, Juznic N, Aleksic M, Ljubic A. 1993 A comparison of cytological and cervicography in cervical screening. *Int J Gynecol Oncology* 3: 395-98.
17. Goldie SJ, Kuhn L, Denny L et al. Policy analysis of cervical cancer screening strategies in low-resource setting: clinic benefits and cost effectiveness. *JAMA*. 2001; 285(24): 3107-15.
18. Kitchner HC and Symonds P. Detection of cervical intraepithelial neoplasia in developing countries (commentary). *Lancet*. 1999; 355: 856-57.
19. Special issue [Topics of quality assurance in cervical cytology]. *Acta Cytol* 1996; 40: 1-142.
20. Coppleson M, Reid BL, Skladnev VN, Dalrymple JC. An electronic approach to the detection of pre-cancer and cancer of the uterine cervix: a preliminary evaluation of a polarprobe. *Int. J Gynecol. Cancer* 1994; 4: 79-83.
21. Bosch FX, Manos MM, Munos N et al. Prevalence of Human Papillomavirus in cervical cancer: a worldwide perspective. *J Natl Cancer Inst* 1995; 87: 796-802.
22. Walboomers JM, Jacobs MV, Manos MM et al. Human Papilloma virus is a necessary cause of invasive cervical worldwide. *J. Pathol* 1999; 189: 12-19.

23. Cox JT. Clinical role of HPV testing. *Obstet Gynecol Clin North Am.* 1996; 23: 811-51.
24. Davey DD. Papanicolaou smear 5-year retrospective review: what is required by the Clinical Laboratory Improvement Amendments of 1988? *Arch Pathol Lab Med* 1996; 120: 519-22.
25. Shaw RW, Soutter PW, Stanton SL. *Gynaecology. Third Edition. Surgical Anatomy.* 2003; 2:21-36.
26. del Refugio MG, Laviada M, Teran MA et al. Molecular variants of HPV type 16 E⁺ among Mexican women with LSIL and invasive cancer. *J Clin Virology.* 2004 Feb, Vol. 29. 2: 95-99.
27. ALTS 2000 Human papillomavirus testing for triage of women with cytologic evidence of low-grade squamous intraepithelial lesions: baseline data from a randomised trial. *J Nat Cancer Institute* 92: 397-402.
28. Woodman C, Collins S, Winter H et al 2001. Natural history of cervical human papillomavirus infection in young women: a longitudinal cohort study. *Lancet* 357: 1831-36.
29. Hopman E, Rozendaal L, Voorhorst T, Walboomers, Kenemans P. Helmerhorst Th 2000. High risk Human papillomavirus in women with normal cervical

cytology prior to the development of abnormal cytology and colposcopy. British J. Obstet. Gynaecol. 107: 600-4.

30. VonkaV, Kanka J, Hirsch I et al. Perspective study on the relationship between cervical neoplasia and herpes simplex type II virus. Herpes simplex type II antibody present in serum taken at enrolment. Int. J. Cancer. 1984; 33: 61.
31. Anttila T, Saikku P, Koskela P et al. 2001. Serotypes of Chlamydia trachomatis and risk for development of cervical squamous cell carcinoma. JAMA 285: 47-51.
32. Turner MJ, White JO, Soutter WP. 1990. Human seminal plasma inhibits the lymphocyte response to infection with Epstein – Barr virus. Gynaecologic Oncology 37: 1022-26.
33. Maiman M. Cervical neoplasia in women with HIV infection. Oncol. 1994; 8:83.
34. Johnson JC, Burnett AF, Willet GD et al. High frequency of latent and clinical HPV cervical infections in immunocompromised HIV infected women. Obstet. Gynecol. 1992; 79: 321.
35. Chirenje ZM, Loeb L, Mwale M et al. Association of cervical SIL and HIV-1 infection among Zimbabwean women in an HIV/STI prevention study. Int. J. STD AIDS. 2002 Nov; 13 (11): 765-8.

36. Levi JE, Kleter B, Quint WG et al. High prevalence of Human Papilloma virus (HPV) infections and high frequency of multiple HPV genotypes in human immunodeficiency virus-infected women in Brazil. *Clin. Microbiol.* 2002 Sept; 40(9): 3341-5.
37. Davis AT, Chakraborty H, Flowers L, Mosunjac MB 2001 Cervical dysplasia in women infected with the human immunodeficiency virus (HIV): a correlation with HIV viral load and CD4 count. *Gynecologic Oncology* 80: 350-54.
38. Cohen AL, Rosenberg AJ, McCann MF. Active and passive cigarette smoke exposure and cervical neoplasia. *Ca Epid Biomark and Prev.* 1992; 1: 349.
39. Trevathan E, Loyde P, Webster LA et al. Cigarette smoking and cervical dysplasia in carcinoma in situ of the uterine cervix. *JAMA* 1983; 250: 499.
40. Harris TG, Kulasingam SL, Kiviat NB et al. Cigarette smoking, oncogenic human papillomavirus, Ki-67 antigen, and cervical intraepithelial neoplasia. *Am J Epidemiol.* 2004 May 1; 159(9): 834-42.
41. Plummer M, Herrero R, Franceschi S et al. Smoking and cervical cancer: pooled analysis of the IARC multi-centric case-control study. *Cancer Causes Control.* 2003 Nov; 14(9): 805-14.

42. Minkoff H, Feldman JG, Strickler HG et al. Relationship between smoking and human papillomavirus infections in HIV-infected and –uninfected women. *J. Infect Dis.* 2004 May 15; 189(10) 1821-8.
43. Acladios N, Mandel, Kitchener HC 2001 Persistence human papillomavirus infection and smoking increase the risk of failure of treatment of cervical intraepithelial neoplasia. *Int J. Cancer* (in Press).
44. Fenoglio CM, Ferenczy A. Etiologic factors in cervical neoplasia. *Sem Oncol.* 1982; 9:349.
45. Elliot P, Coppleson M, Russell P et al. Early invasive (FIGO stage IA) carcinoma of the cervix: a clinico-pathologic study of 476 cases. *Int J Gynaecol Cancer.* 2000; 10: 42-52.
46. Fuller A, Elliot N, Kosloff C, Lewis J. Lymph node metastases from carcinoma of the cervix, stages Ib and IIa: implications for prognosis and treatment. *Gynecological Oncology.* 1982; 13:165-174.
47. Marrow C, Shingleton H, Austin M et al. Is pelvic radiation beneficial in the postoperative management of stage Ib squamous cell carcinoma of the cervix with pelvic node metastases treated by radical hysterectomy and pelvic lymphadenectomy? *Gynecological Oncology.* 1980; 10:105-110.

48. FIGO 1998 Annual report on the results of treatment in gynaecological cancer. Twenty-third volume. *Journal of Epidemiology and Biostatistics* 3: 5-7.
49. Landoni F, Manco A, Colombo A et al. Randomised study of radical surgery versus radiotherapy for stage Ib-IIa cervical cancer. *Lancet*. 1997; 350: 535-540.
50. Barillot I, Horiot JC, Maingon P et al. Impact on treatment outcome and late effects of customised treatment planning in cervix carcinomas: baseline results to compare new strategies. *Int. J. Radiation Oncol, Biol, Phy*. 2000; 48:189-200.
51. Denton AS, Bond SJ, Mathews S, Bentzen SM, Maher EJ. National audit of the management and outcome of carcinoma of the cervix treated with radiotherapy in 1993. *Clinical Oncology*. 2000; 12: 347-353.
52. Vermorken J. 1993. The role of chemotherapy in squamous carcinoma of the uterine cervix: a review. *Int. J. Gynecol. Cancer*. 3: 121-142.
53. Green JA, Kirwan JM, Tierney JF et al 2001. Survival and recurrence after concomitant chemotherapy and radiotherapy for cancer of the uterine cervix: a systematic review and meta-analysis. *Lancet*. 328: 781-786.
54. van de Vange, Weverling G, Ketting B et al 1995. The prognosis of cervical cancer associated with pregnancy: a matched cohort study. *Obstet. Gynecol*. 85: 1022-1026.

55. Heller P, Barnhill D, Mayer A et al 1986. Cervical carcinoma found incidentally in a uterus removed for benign indications. *Obstetrics and Gynecology* 67: 187-190.
56. Bissett D, Lamont D, Nwabineli N, Brodie M, Symonds R 1994. The treatment of stage I carcinoma of the cervix in the west of Scotland. *British Journal of Obstetrics and Gynaecology*. 101: 615-620.
57. Kinney W, Egorshin E, Ballard D, Podratz K 1992. Long-term survival and sequelae after surgical management of invasive cervical carcinoma diagnosed at the time of simple hysterectomy. *Gynecological Oncology*. 44: 24-27.
58. Rogo KO, Omany J, Onyango JN, et al. Carcinoma of the cervix in the African setting. *Int. J Gynaecol Obstet* 1990; 33: 249.
59. Buga GAB, Cervical cancer awareness and the risk factors among female university students. *East Afr Med J* 1998; 75: 411.
60. Machoki JMN and Rogo KO. Knowledge and attitudinal study of Kenyan women in relation to cervical carcinoma. *Int J Gynaecol Obstet* 1990; 34: 55.
61. Emembolu JO and Ekwempu CC. Carcinoma of the cervix uteri in Zaria: Etiological factors. *Int J Gynaecol Obstet* 1988; 26: 265.

62. Kasule J. The pattern of gynaecological malignancy in Zimbabwe. *East Afr Med J* 1989; 66: 393.
63. Tarwireyi F, Chirenje ZM and Rusakaniko S. Cancer of the cervix: knowledge, beliefs and screening behaviours of the health workers in Mudzi District in Mashonaland East Province, Zimbabwe.
64. McFarland DM. Cervical cancer and Pap smear screening in Botswana: knowledge and perceptions. *Int Nurs Rev* 2003 Sept; 50(3): 167-75.
65. Wellensiek N, Moodley M, Moodley J, Nkwanyana N. Knowledge of cervical cancer screening and use of cervical screening facilities among women from various socioeconomic backgrounds in Durban, Kwazulu Natal, South Africa. *Int J Gynecol Cancer*. 2002 Jul-Aug; 12(4): 376-82.
66. Pillays AL. Rural and urban South African women's awareness of cancers of the breast and cervix. *Ethn Health*. 2002 May; 7(2): 103-14.
67. Gichangi P, Estambale B, Bwayo J et al. Knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital, Nairobi, Kenya. *Int J Gynecol Cancer*. 2003 Nov-Dec; 13(6): 827-33.
68. Kindato HL, Kilewo CD, Moshiro C. Cancer of the cervix: knowledge and attitudes of female patients admitted at Muhimbili National Hospital, Dar es Salaam. *East Afr Med J* 2002 Sept; 79(9): 467-75.

69. Ayinde OA and Omigbodun AO. Knowledge, attitude and practices related to the prevention of cancer of the cervix among female health workers in Ibadan. *J Obstet Gynaecol*. 2003 Jan; 23(1): 59-62.
70. Adanu RMK. Cervical cancer knowledge and screening in Accra, Ghana. *Journal of Women's Health & Gender-Based Medicine*. 2002; 11(6): 487-488.
71. Agurto I, Bishop A, Sanchez G et al. Perceived barriers and benefits to cervical cancer screening in Latin America. *Prev Med*. 2004 Jul; 39 (1): 91-98.
72. Watkins MM, Gabali C, Winkleby M et al. Barriers to cervical cancer screening in rural Mexico. *Int J Gynecol Cancer* 2002 Sept-Oct; 12 (5): 475-9.
73. Aguilar-Perez JA, Leyva-Lopez AG, Angulo-Najera D et al. Cervical cancer screening: knowledge of Pap smear benefits and utilization in Mexico. *Rev Saude Publica* 2003; 37(1): 100-6.
74. Claeys P, Gonzalez C, Gonzalez M et al. Determinants of cervical cancer screening in a poor area: results of a population-based survey in Rivas, Nicaragua. *Trop Med Int Health*. 2002 Nov; 7(11): 935-41.
75. Hewitt M, Devessa SS and Breen N. Cervical cancer screening among U.S. women: analyses of the 2000 National health Interview Survey. *Prev Med* 2004 Aug; 39(2): 270-8.

76. Nguyen TT, McPhee SJ, Nguyen T et al. Predictors of cervical Pap smear screening awareness, intention, and receipt among Vietnamese-American women. *Am J Prev Med.* 2002 Oct; 23(3): 207-14.
77. Ralston JD, Taylor VM, Yasui Y et al. Knowledge of cervical cancer risk factors among Chinese immigrants in Seattle. *Community health.* 2003 Feb; 28(1): 41-57.
78. Scarinci IC, Beech BM, Kovach KW and Bailey TL. An examination of sociocultural factors associated with cervical cancer screening among low-income Latina immigrants of reproductive age. *J Immigr Health.* 2003 Jul; 5(3): 119-128.
79. Byrd TL, Peterson SK, Chavez R and Heckert A. Cervical cancer screening beliefs among young Hispanic women. *Prev Med.* 2004 Feb; 38(2): 192-7.
80. Juon HS, Seung-Lee C and Klassen AC. Predictors of regular Pap smears among Korean-American women. *Prev Med.* 2003 Dec; 37(6 pt 1): 585-92.
81. Hislop TG, Deschamps M, The C et al. Facilitators and barriers to cervical cancer screening among Chinese Canadian women. *Can J Public Health.* 2003 Jan-Feb; 94(1): 68-73.
82. Idstrom M, Milsom I and Andersson-Ellstrom A. Knowledge and attitudes about the Pap-smear screening program: a population based study of women aged 20-59 years. *Acta Obstet Gynecol Scand.* 2002 Oct; 81(10): 962-7.

83. Twinn S, Shiu AT and Holroyd E. Women's knowledge about cervical cancer and cervical screening practice: a pilot study of Hong Kong Chinese women. *Cancer Nurs.* 2002 Oct; 25(5): 377-84.
84. Holroyd EA, Taylor-Piliae RE and Twinn SF. Investigating Hong Kong's Filipino domestic workers' healthcare behaviour, knowledge, beliefs and attitudes towards cervical cancer and cervical screening. *Women Health.* 2003; 38(1): 69-82.
85. 1997-2001 National Cervical Cancer Coalition. Cervical cancer screening project in Mulanje District, Malawi. 2001.
86. Gupta A, Kumar A and Stewart DE. Cervical cancer screening among South Asian women in Canada: the role of education and acculturation. *Health Care Women Int.* 2002 Feb; 23 (2): 123-34.
87. Progress in Reproductive Research. Cervical cancer prevention: screening still the only option. No. 65. 2004.