



## **The Study of Prevalence, Knowledge, Attitude, Beliefs and Practice of Cervical Cancer in HIV Positive Women in Purdah and HIV Positive Women Not in Purdah in Gombe State Nigeria**

**S. Umar<sup>1\*</sup>, J. O. Adisa<sup>2</sup>, O. O. Okechi<sup>3</sup>, U. Abubakar<sup>4</sup> and A. B. Imam<sup>5</sup>**

<sup>1</sup>Department of Histopathology, Federal Medical Teaching Hospital, Gombe State, Nigeria.

<sup>2</sup>Department of Medical Laboratory Science, University, of Jos, Nigeria.

<sup>3</sup>Department of Medical Laboratory Science, Abia State University, Nigeria.

<sup>4</sup>Department of Histopathology, School of Medical Laboratory Science, Usmanu Danfodiyo University, Sokoto, Nigeria.

<sup>5</sup>Department of Histopathology, Maiduguri University, Teaching Hospital, Borno State, Nigeria.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author SU owner of the work source the materials and perform the design of the work. Authors JOA and OOO managed the overall cross the work to ensure that everything is in order. Author UA carried out statistical analysis and interpretation of the results. Author ABI managed the references. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** Purdah or pardah is a Persian word which translated loosely to mean 'curtain', is a religious and social practice of female seclusion prevalent among some Muslim communities. In stating the reasons for the need of purdah, the Qu'ran declares that "the observance of hijab is so that the (pure and pious women) may be recognized and not be molested" Cervical cancer is a malignant disease of the cervix. The disease has a pre-malignant stage which usually occurs in younger women. Carcinoma of the cervix is associated with the following risk factors; early age at first sexual intercourse, multiple male sexual partners, male sexual partners who have had multiple partners, early age at first birth, multiparty, smoking, long-term use of oral contraceptive

\*Corresponding author: E-mail: saratu@gmail.com;

pills, immunosuppressed states. Cervical cancer is preventable through vaccination and can be easily diagnosed, but prevention and diagnostic programmes are not widely available in the developing world (Branca et al., 2003). Rates of cervical cancer are four to five times higher among women living with HIV than among HIV negative women, while the overall risk of acquiring HIV among women doubles when women are infected with the human papillomavirus, a cause of cervical cancer.

**Aim:** To study the Prevalence, Knowledge, Attitude, Beliefs and Practice of cervical cancer in HIV positive women in purdah and HIV positive women not in purdah, and relate this to the prevalence of cervical cancer.

**Methods:** The study was a cross-sectional study to determine the prevalence of cervical cancer among HIV positive women in purdah attending the anti retroviral therapy (ART) Clinic of the Federal Teaching Hospital, Gombe. A sample size of 150 each was used for both the subject group and controls. HIV positive women in purdah=150 subjects, HIV positive women not in purdah= 150 subjects and HIV negative women not in purdah =150 subjects. Sample size equals 450 to give room for alteration.

**Results:** Results collected using the questionnaire revealed that only a mean of about 41 (27.3%) HIV positive women in purdah had correct knowledge of Cervical Cancer as compared with HIV positive women not in purdah who had a mean of 129 (86.0%) and 114 (76.7%) for HIV negative women not in purdah. Large percentage of 61.3% of HIV positive women in Purdah, 86.0% of HIV positive women not in purdah and 76.7% of HIV negative women not in purdah, had previous knowledge of Cervical Cancer. The knowledge about the link between early marriages to increased risk of cervical cancer was not low amongst HIV positive women in purdah (34.7%) but this was not the case with their counterparts as 86.0% of HIV positive women not in purdah and 80.7% of HIV negative women in purdah were knowledgeable about the link. Not less than 95% of women in all groups expressed indifference towards the gender of the personnel collecting the Pap smear nevertheless some still showed some reluctance towards having their pap smear collected by personnel of the opposite sex. Women in purdah showed the highest percentage of this reluctance (4.7%). As regards to practices, the women in purdah had a mean positive practice of 63.3% as against 58.7% and 60.8% respectively of the control group (HIV positive women not in purdah and HIV negative women not in purdah). Women in purdah had a higher positive practice in all cases except the issues of husbands deciding the number of children (16.7% -HIV positive women in purdah, 88.0% -HIV positive women not in purdah and 100% -HIV negative women not in purdah) and husbands deciding when to stop having children (35.5% -HIV positive women in purdah, 52.0% -HIV positive women not in purdah and 43.3% -HIV negative women not in purdah).

**Conclusion:** The prevalence of cervical lesions in HIV positive women in purdah (42.0%) is higher than that of HIV negative women not in purdah (16.0%), but lower than that of HIV positive women not in purdah (56.0%). HIV positive women in purdah had the lowest knowledge of cervical cancer with a mean score of (27.3%) while the control groups had a higher knowledge of 86.0% and 76.7% respectively. This implies that there is need for comprehensive and correct knowledge, positive attitude/ beliefs and positive behavioral practice are important in the control of cervical cancer and diseases in general.

*Keywords: Prevalence; knowledge; attitude; beliefs; practice; cervical cancer; HIV and purdah.*

## 1. INTRODUCTION

Purdah or pardah is a Persian word which translated loosely to mean 'curtain', is a religious and social practice of female seclusion prevalent among some Muslim communities [1]. In stating the reasons for the need of purdah, the Qu'ran declares that "the observance of hijab is so that the (pure and pious women) may be recognized and not be molested". It takes two forms: physical segregation of the sexes and the requirement that women cover their bodies so as

to cover the skin and conceal their form [2]. Advocates of purdah attributed its introduction to the place of the devil, in our daily interactions particularly its powerful influence on relationship between men and women. It is their view that purdah became necessary because gaze at a girl is a poisonous arrow among the arrows of the devil. To them, every eye is a fornicator and when a man is alone with a woman, the third one present is the devil. Furthermore, it is desirable to guide the piracy of household, to prevent men from entering the house of another man as it is

unlawful for a woman who is a believer to allow anyone to enter the house without the man's permission [3]. The practice of seclusion and restrictions that reduces access to information on even health issues may affect their access to medical. The practice of a general form of awareness that does not address the socio-cultural peculiarities of women who practice *purdah* cannot be effective. The need for a focused education and approach to control on this category of women cannot be overemphasized [3].

Cervical cancer is a malignant disease of the cervix. The disease has a pre-malignant stage which usually occurs in younger women. Carcinoma of the cervix is associated with the following risk factors; early age at first sexual intercourse, multiple male sexual partners, male sexual partners who have had multiple partners, early age at first birth, multiparity, smoking, long-term use of oral contraceptive pills, immunosuppressed states [4].

Cervical cancer ranks as the second most common cancer in women worldwide and the most common cause of mortality from gynecologic malignancy, with an estimated 270,000 deaths annually. Over 85% of both cervical cancer cases and deaths occur in developing countries including Nigeria with only 5% of global cancer resources [5]. Cervical cancer is the most common cancer in women in most developing countries and most common cause of cancer deaths [6]. It is the leading cause of years of life lost to cancer in low resource settings [7]. The Northern part of the Nigeria is known to have the highest maternal mortality rates in the country. Thus, a lot of attention has been directed at reducing obstetric deaths while neglecting the high morbidity and mortality due to genital tract malignancies which are also very common in this region. Thus there is need to decrease gynecological malignancies and increase survival [8].

Women living with human immunodeficiency virus (HIV) infection have a much higher risk of human papillomavirus infection and cervical cancer than do HIV-uninfected women. Before the introduction of antiretroviral therapy, the lack of cervical cancer screening among HIV-infected women probably had little influence on their life expectancies because of the high competing mortality associated with other causes, but the situation is changing rapidly everywhere [9].

The progression of cervical cancer lesions is slow and most of these lesions are asymptomatic but can be detected early through cervical cancer screening (CCS). Cervical cancer is preventable if detected early and treated early [10]. It takes a long time for (HPV) infection to develop to pre-cancer but it takes less time in HIV positive women [11]. Early detection of cervical cancer can lead to a positive prognosis that can result in decreased mortality and reduced health costs, but it can lead to untold suffering of individuals/family as well as significant community adverse effects if left unattended to [12]. Research suggests that intrinsic factors influence women's Cervical Cancer Status (CCSU) and this has been reported consistently among different populations that include Caucasian, Asian, Africans and Latino American women [13].

Cervical cancer is preventable through vaccination and can be easily diagnosed, but prevention and diagnostic programmes are not widely available in the developing world. Rates of cervical cancer are four to five times higher among women living with HIV than among HIV negative women, while the overall risk of acquiring HIV among women doubles when women are infected with the human papillomavirus, a cause of cervical cancer [14].

## 2. MATERIALS AND METHODS

### 2.1 Study Area

The Federal Teaching Hospital, Gombe is located within the city of Gombe, the capital of Gombe state which is one of the 36 states of the Federal Republic of Nigeria. Gombe is located between latitude 10° and 11°N within the Savannah region. It has a population of about 2.5 million people according to 2006 population census and an area of 18,000 km<sup>2</sup>.

The hospital was established in 1996 with a mandate to serve Gombe state as a referred tertiary health care facility. It has 451 beds capacity with about 90% occupancy rate. The hospital is one of the 10 tertiary hospital designated for National cancer control program by the federal Government of Nigeria and International Atomic Energy (IAEA).

### 2.2 Study Population

This research was carried out in Federal Teaching Hospital, Gombe, (FTH), Gombe state,

Nigeria. Participants were recruited in collaboration with physicians and other health workers managing the study subject.

A well structured questionnaire which contained both close and open ended questions was administered on each of the study subject to collect data from each respondent, before which they must fill an informed consent form. The questionnaire contained questions on the socio-demographic profiles of the subject's e.g. age, sex, educational status, marital status, occupation. Questions about their knowledge, attitude/beliefs and practices that may predispose them to cervical cancer were also asked.

### 2.3 Research Design

The study was a cross-sectional study to determine the prevalence of cervical cancer among HIV positive women in purdah attending the anti retroviral therapy (ART) Clinic of the Federal Teaching Hospital, Gombe. A sample size of 150 each was used for both the subject group and controls i.e HIV positive women in purdah=150 subjects, HIV positive women not in purdah= 150 subjects and HIV negative women not in purdah =150 subjects. Sample size equals 450 to give room for alteration.

### 2.4 Subject Recruitment

HIV positive women in purdah attending the ART clinic of the Federal Teaching Hospital, Gombe were selected to participate in this study as test group, while HIV positive women not in purdah and HIV negative women not in purdah were chosen as the control groups. Questionnaire containing both open ended questions and closed ended questions was administered to each of the subjects after signing a consent form. Their Pap smears were collected in collaboration with other health workers attending to the subjects.

### 2.5 Statistical Analysis

The statistical software GRAPHPAD PRISM, version 7.0 (Graph Pad Software, Inc. California, USA) was used to analyze the socio-economic components of this work. Ordinary Two-way ANOVA was used to analyze grouped data (Tables 4, 5 and 6). Chi Square Test was used to analyze data containing contingency Tables

(7, 8A, 8B, and 8C). Data was also reported in tables.

## 3. RESULTS

Results collected using the questionnaire (Table 1) revealed that only a mean of about 41 (27.3%) HIV positive women in purdah had correct knowledge of Cervical Cancer, its risk factors, warning signs, treatability and the test used for its screening as compared with HIV positive women not in purdah who had a mean of 129 (86.0%) and 114 (76.7%) for HIV negative women not in purdah. However, a large percentage of 61.3% of HIV positive women in Purdah, 86.0% of HIV positive women not in purdah and 76.7% of HIV negative women not in purdah, had previous knowledge of Cervical Cancer.

The knowledge about the link between early marriages to increased risk of cervical cancer was not low amongst HIV positive women in purdah (34.7%) but this was not the case with their counterparts as 86.0% of HIV positive women not in purdah and 80.7% of HIV negative women in purdah were knowledgeable about the link. Not less than 95% of women in all groups expressed indifference towards the gender of the personnel collecting the Pap smear nevertheless some still showed some reluctance towards having their pap smear collected by personnel of the opposite sex. Women in purdah showed the highest percentage of this reluctance (4.7%).

Most women in all groups believe that there is no relationship between cervical cancer and witchcraft or evil spirits, however, 34.0% of HIV positive women in purdah, 1.3% of HIV positive women not in purdah and 6.0% of HIV negative women not in purdah believe that the relationship does exist. HIV positive women in purdah were more inclined to believing that cervical cancer can be treated with herbs (50.7%). HIV positive women in purdah (86.0%) showed a remarkable willingness to participate in an organized cervical cancer screening; more remarkably, both control groups show 100% willingness to participate in the screening. On the average, all groups showed similar and commendable positive attitude and beliefs (90.2%, 90.0%, and 89.6% respectively) towards cervical cancer (Table 2).

**Table 1. Distribution of HIV positive women practicing purdah/control groups according to their knowledge in relation to cervical cancer**

Knowledge Aspect	HIV +VE women in Purdah		Control Groups			
	Yes (%)	No (%)	HIV +VE Women not in Purdah		HIV -VE women not in Purdah	
			Yes (%)	No (%)	Yes (%)	No (%)
1. Have you heard of cervical cancer?	92(61.3%)	58(38.7%)	129(86.0%)	21(14.0%)	115(76.7%)	25(23.3%)
2. Warning signs for cervical cancer are:						
a) Vaginal bleeding between periods.	32(21.4%)	118(78.7%)	129(86.0%)	21(14.0%)	105(70.0%)	45(30.0%)
b) Persistent vaginal discharge that does not respond to antibiotics	29(19.3%)	121(80.7%)	131(87.3%)	19(12.7%)	103(68.7%)	47(31.3%)
c) Bleeding or pain during or after sex?	30(20.0%)	120 (80.0%)	130(86.7%)	20(13.3%)	105(100%)	45(30.0%)
d) A persisted pelvic pain?	31(20.7%)	119(79.3%)	129(86.0%)	21(14.0%)	102(68.0%)	48(32.0%)
3. Is cervical cancer treatable?	41(27.3%)	109(72.7%)	124(82.7%)	26(17.3%)	136(90.7%)	14(9.3%)
4. Are you aware of the test used to screen for cervical cancer?	32(21.4%)	118(78.7%)	131(87.3%)	19(12.7%)	133(88.7%)	17(11.3%)
MEAN	41(27.3%)	109(72.7%)	129 (86.0%)	21 (14.0%)	115*(76.7%)	35*(23.3%)

*\*Rounded-up to the nearest whole number*

**Table 2. Distribution of HIV positive women in purdah/control groups according to their attitude and beliefs in relation to cervical cancer**

Attitudes and Beliefs	HIV +VE Women in Purdah		Control Groups			
	Yes (%)	No (%)	HIV +VE Women not in Purdah		HIV -VE women not in Purdah	
			Yes (%)	No (%)	Yes (%)	No (%)
1. Is early marriage associated with cervical cancer?	52 (34.7%)	98 (65.3%)	129 (86.0%)	21 (14.0%)	121 (80.7%)	29 (19.3%)
2. Will you allow a male health worker to collect your cervical smear?	143 (95.3%)	7 (4.7%)	148 (98.7%)	2 (1.3%)	149 (99.3%)	1 (0.7%)
3. Do you think cervical cancer occur as a result of witchcraft or evil spirits?	51 (34.0%)	99 (66.0%)	2 (1.3%)	148 (98.7%)	9 (6.0%)	141 (94.0%)
4. Do you think it can be treated using herbs?	76 (50.7%)	74 (49.3%)	21 (14.0%)	129 (86.0%)	9 (6.0%)	141 (94.0%)
5. Will you participate in an organized cervical cancer screening?	129 (86.0%)	21 (14.0%)	150 (100%)	0 (0.0%)	150 (100%)	0 (0.0%)
Mean	90.2 (60.1%)	59.8 (39.9%)	90 (60.0%)	60 (40.0%)	87.6 (58.4%)	62.4 (41.6%)

**Table 3. Shows the distribution of HIV positive women in purdah/control groups according to practices in relation to cervical cancer**

Practice in Purdah	HIV +VE Women in Purdah		Control Groups			
			HIV +VE Women not in Purdah		HIV -VE Women not in Purdah	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1. Did you get married before you attained the age of 18 years?	133 (88.7%)	17 (11.3%)	62 (41.3%)	88 (58.7%)	104 (69.3%)	46 (30.7%)
2. Does your husband/guardian give you permission to access health care?	112 (74.7%)	38 (25.3%)	101 (67.3%)	49 (32.7%)	71 (47.3%)	79 (52.7%)
3. Do you attend antenatal Clinic during pregnancy?	127 (84.7%)	23 (15.3%)	113 (75.3%)	37 (24.7%)	124 (82.7%)	26 (17.3%)
4. Have you ever used oral contraceptives?	96 (64.0%)	54 (36.0%)	83 (55.3%)	67 (44.7%)	64 (42.7%)	86 (57.3%)
5. Does your husband have other wives?	111 (74.0%)	39 (26.0%)	69 (46.0%)	81 (64.0%)	77 (51.3%)	73 (48.7%)
6. Have you been pregnant more than five times?	102 (68.0%)	48 (32.0%)	69 (46.0%)	81 (64.0%)	75 (50.0%)	75 (50.0%)
7. Does your husband decide when to stop having children?	53 (35.5%)	97 (64.7%)	78 (52.0%)	72 (48.0%)	65(43.3%)	85 (56.7%)
MEAN	94.9(63.3%)	55.1(36.7%)	88.0*(58.7%)	62.0*(41.3%)	91.2 (60.8%)	58.8(39.2%)

*\*Rounded-up to the nearest whole number*

As regards to practices (Table 3), the women in purdah had a mean positive practice of 63.3% as against 58.7% and 60.8% respectively of the control group (HIV positive women not in purdah and HIV negative women not in purdah). Women in purdah had a higher positive practice in all cases except the issues of husbands deciding the number of

children (16.7% -HIV positive women in purdah, 88.0% -HIV positive women not in purdah and 100% -HIV negative women not in purdah) and husbands deciding when to stop having children (35.5% -HIV positive women in purdah, 52.0% -HIV positive women not in purdah and 43.3% -HIV negative women not in purdah).

**Table 4. Age distribution and pap smear result of HIV positive women in Purdah**

Age interval (Yrs)	FX (%)	N	NSI	ASCUS	LGSIL	HGSIL	SCC
11-20	36(24)	9	18	8	-	-	-
21-30	49(32.7)	5	13	6	15	9	-
31-40	35(23.3)	2	7	2	10	8	-
41-50	28(18.7)	2	3	4	7	11	1
51-60	2(1.3)	-	-	-	-	1	1
61-70	-	-	-	-	-	-	-
71-80	-	-	-	-	-	-	-
TOTAL	150	18	41	20	32	29	2

KEY: Fx=Frequency, N=NORMAL, NSI=Non-Specific Inflammation, ASC=Atypical Squamous Cell of Undetermined Significance, LGSIL=Low Grade Squamous Intraepithelial Lesion, HGSIL=High Grade Squamous Intraepithelial Lesion.

\*TEST: ordinary two ways ANOVA. Test was found to be significant at 95 confidence level. P value (P=0.0001)

**Table 5. Age distribution and pap smear result of HIV positive women not in purdah**

Age interval (yrs)	FX(%)	N	NSI	ASCUS	LGSIL	HGSIL	SCC
11-20	7(4.7)	3	3	-	-	-	-
21-30	42(28)	10	9	5	6	12	-
31-40	51(34)	7	17	3	13	11	1
41-50	36(24)	1	7	-	9	15	-
51-60	10(6.7)	-	2	1	3	4	-
61-70	2(1.3)	-	-	-	-	-	2
71-80	2(1.3)	-	-	-	-	-	2
TOTAL	150	21	38	9	31	42	5

KEY: =Inadequate, Fx=Frequency, N=Normal, NSI=Non Specific Inflammation, ASC=Atypical Squamous Cell of Undetermined Significance, LGSIL=Low Grade Squamous Intraepithelial Lesion, HGSIL=High Grade Squamous Intraepithelial Lesion.

\*TEST: Ordinary Two way ANOVA was used and test were found to be significant at 95% confidence level. P value (P<0.0001)

**Table 6. Age distribution and pap smear result of HIV negative women not in purdah**

Age interval (yrs)	FX (%)	N	NSI	ASCUS	LGSIL	HGSIL	SCC
11-20	10(6.7%)	6	2	2	-	-	-
21-30	28(18.7%)	3	9	8	6	-	-
31-40	43(28.7%)	15	18	4	2	3	-
41-50	47(31.3%)	12	22	5	4	4	-
51-60	12(8.0%)	3	5	2	-	-	-
61-70	6(4.0%)	1	3	1	-	1	-
71-80	4(2.7%)	-	-	-	2	1	1
TOTAL	150	40	59	22	14	9	1

KEY:\*=Inadequate, Fx=Frequency, N=Normal, NSI=Non Specific Inflammation, ASC=Atypical Squamous Cell of Undetermined Significance, LGSIL=Low Grade Squamous Intraepithelial Lesion, HGSIL=High Grade Squamous Intraepithelial Lesion.

\*TEST: Ordinary Two way ANOVA was used and test found to be significant at 95% confidence level. P value (P<0.0001)

**Table 7. Percentage distribution of abnormalities in all groups**

Groups	LGSIL(%)	HGSIL(%)	SCC(%)
HIV +ve women in purdah	32(21.3%)	29(19.3%)	2(1.3%)
HIV +ve women not in purdah	37(24.7%)	42(28%)	5(3.3%)
HIV –ve women not in purdah	14 (9.3%)	9 (6%)	1 (0.6%)
TOTAL=	83(18.4%)	80(17.8%)	8(1.8%)

KEY: LGSIL=Low grade squamous intraepithelial neoplasm, HGSIL=High grade squamous intraepithelial neoplasm, SCC=Squamous cell carcinoma.\*TEST: Chi-Square P value<0.0001.Values were found to be statistically significant at 95% confidence level (P < 0.05)

**Table 8a. Relationship between KABP of HIV +VE women in purdah and prevalence of premalignant and malignant lesions**

Knowledge aspect	Yes	No	% Premalignant	% Malignant
• Knowledge about cervical cancer	92 (61.3%)	58 (38.7%)		1(0.7%)
• Knowledge about risk factors	32 (21.4%)	118 (78.7%)	23(15.3%)	
• Knowledge about treatability	41 (27.3%)	109 (72.7%)		
• Knowledge about pap smear	32 (21.4%)	118 (78.7%)		
<b>Attitude/Beliefs</b>				
• Early marriage associated with ca cervix	52 (34.7%)	98 (65.3%)		
• Collection of pap smear by a male worker	143 (95.3%)	7 (4.7%)	14(9.3%)	
• Ca cervix association with witchcraft or spirit	51(34.0%)	99 (66.0%)		
• Participation in an organized screening	129 (86.0%)	21 914.0%)		
<b>Practice</b>				
• Age at marriage <18yrs	133(88.7%)	17(11.3%)		
• Permission to access healthcare	112(74.7%)	38(25.3%)		
• Decision making in reproductive health	53(35.5%)	97(64.7%)	24(16.0%)	1(0.7%)
• Attitude to having co-wives	111 (74.0%)	39 (26.0%)		
Mean			61(40.7%)	2(1.3%)

\*TEST: Chi-sqaure test was used, p value of < 0.0001 were found to be statistically significant at (P<0.05)

#### 4. DISCUSSION

The principal finding of this research was the prevalence of cervical squamous cell abnormalities in the study group, which was found to be 42.0% for the test group, 56.0% and 16.0% for the control groups respectively. These lesions were further classified into premalignant and malignant lesions. The prevalence of premalignant abnormalities was found to be 40.7% in the test group, this comprised of LGSIL (21.4%), HGSIL (19.3%), while the malignant lesions accounted for 1.3% which were Squamous cell carcinoma of the cervix. The first control group (Hiv positive women not in purdah

had a prevalence of 52.7% of premalignant lesions (LGSIL-24.7%, HGSIL-28.0%) and 3.3% prevalence for malignant lesion. The second control group had a premalignant lesion prevalence of 15.3 % (LGSIL-9.3%, HGSIL-6.0%), with a prevalence of 0.7% for malignant lesion.

High prevalence of precancerous and cancer in HIV positive women has also been reported from other studies conducted in Rwanda, Kenya, South Africa, Uganda and Zambia. They reported a prevalence of 24.3%, 26.7%, 66.3%, 73.0% and 76% respectively [15,16,17,18,19].



**Table 8b. Relationship between KABP of HIV +VE women not in purdah and prevalence of premalignant and malignant lesions**

Knowledge Aspect	YES(%)	NO(%)	PREMALIGNANT (%)	MALIGNANT (%)
• Knowledge about cervical cancer	129 (86.0%)	21(14.0%)	3 (22.67%)	2 (1.3%)
• Knowledge about risk factors	129 (86.0%)	21(14.0%)		
• Knowledge about treatability	124 (82.7%)	26(17.3%)		
• Knowledge about pap smear	131 (87.3%)	19(4.7%)		
<b>Attitude/Beliefs</b>				
• Early marriage associated with ca cervix	129 (86.0%)	21(14.0%)	28(18.6%)	2(1.3%)
• Collection of pap smear by a male worker	148(98.7%)	2(1.3%)		
• Ca cervix association with witchcraft or spirit	2(1.3%)	148(98.7%)		
• Participation in an organized screening	150(100%)	0(%)		
<b>Practice</b>				
• Age at marriage <18yrs	62(41.3%)	88(58.7%)	17(11.3%)	1(0.7%)
• Permission to access healthcare	101(67.3%)	49(32.7%)		
• Decision making in reproductive health	32(88.0%)	18(12.0%)		
• Attitude to having co-wives	69 (46.0%)	81 (64.05)		
Total			79 (52.7%)	5 (3.3%)

\*TEST: Chi-square test was used, p values of < 0.0001 were found to be statistically significant at (P<0.05)

The high prevalence of cervical lesions observed among HIV positive women in purdah in this study can be associated with low knowledge of cervical cancer. Knowledge of cervical cancer in all groups was assessed on the basis of having heard of cervical cancer, its risk factors, warning signs, treatability, and the test used for its screening. On all the aspects of knowledge assessed, the HIV positive women in purdah had a mean score of 27.3% who are knowledgeable while 72.7% were not knowledgeable. This is higher than the findings of Adisa et al. [1] who reported 17.2% awareness amongst women in purdah, but still agrees with their findings of low level of knowledge amongst them. This difference could be accounted for by the fact that this study only considered women in purdah that have been diagnosed HIV positive. Hence their HIV status or exposure to the ART clinic might have provided them with some information on cervical cancer that they were previously not predisposed to. Nevertheless, there is little awareness on cervical cancer in the HIV clinic of Federal teaching hospital Gombe, and those that are aware do not access it, this is consistent with earlier findings in Sudan and Lagos Massad et al. [20] and Rabiou et al. [21].

Low knowledge about the disease could be the reason why they could not differentiate between the signs and symptoms as compared to mere infections, thereby bringing about late presentations.

Okwi et al. [22] reported that only 10% of rural and urban women knew what cervical cancer is. However, this does not seem to be the case now as 86.0% of HIV positive women not in purdah and 76.1% of HIV negative women not in purdah were found to be knowledgeable about cervical cancer in this research. Since almost a decade has passed now from Okwi et al. [22], research, it could be said that there has been most likely a remarkable improvement over the years in the level of awareness of cancer of the cervix.

The high prevalence of cervical squamous cell abnormalities among women in purdah reported in this study can also be most likely attributed to their attitude/beliefs and practices, it is surprising to have found out that quite a percentage of women in purdah (34.0%) still believe that cervical cancer could occur as a result of witchcraft or evil spirits even though a larger

**Table 8c. Relationship between KABP of HIV -VE women not in purdah and prevalence of premalignant and malignant lesion**

Knowledge Aspect	Yes(%)	No(%)	Premalignant (%)	Malignant (%)
• Knowledge about cervical cancer	115 (76.7%)	25(23.3%)	9(6.0%)	1(0.7%)
• Knowledge about risk factors	103 (68.7%)	47 (31.3%)		
• Knowledge about treatability	136 (90.7%)	14 (9.35)		
• Knowledge about pap smear	133(88.7%)	17 (11.3%)		
<b>Attitude/Beliefs</b>				
• Early marriage associated with ca cervix	121(80.7%)	29 (19.3%)	7(4.7%)	-
• Collection of pap smear by a male worker	149(99.3%)	1(0.7%)		
• Ca cervix association with witchcraft or spirit	9(6.0%)	141(94.0%)		
• Participation in an organized screening	150(100%)	0(0.0%)		
<b>Practice</b>				
• Age at marriage <18yrs	104(69.3%)	46 (30.3%)	7(4.7%)	-
• Permission to accesshealthcare	71 (47.3%)	79 (52.7%)		
• Decision making in reproductive health	150(100%)	0(0%)		
• Attitude to having co-wives	7 (51.3%)	73(48.7 %)		
Total			23 (15.3%)	1 (0.7%)

\*Test: Chi-sqaure was used, p values of 0.0194 were found to be statistically significant at (P<0.05)

share do not (66.1%). However, this percentage is still large in comparison to their non-purdah practicing counterparts (1.3% -HIV positive, 6.0% -HIV negative). This could be attributed to the popular belief of jinn attack (seizure-like attack believed to be caused by some class of spirits/ demons) common in the northern part of Nigeria of which purdah practice is more prevalent.

Women in Purdah were also found to be more inclined to orthodox medicine in this research (50.7%). Although this belief is not prevalent among women not in purdah (14.0% -HIV positive, 06.0% -HIV negative). This is in accordance with the findings of Tanyigna et al [23]. When analyzing Reproductory Tract Infections among women in purdah. They reported that 57.6% of women in purdah delayed between the periods of less than a month and more than one year before presenting to the hospital. In this category, 89.8% of them were not aware of the risk involved in the delay, while others in this group were aware of the risk but delayed going to hospitals on the basis that they went to traditional healers or administered self treatment.

It is a common practice in purdah that the men have to ascertain the safety, security and comfort of any place their wives want to visit before giving permission to visit anywhere or accompany them there themselves so as to further ensure their protection and assist with any task that is too demanding of her. This might be one of the reasons why these women delay visiting the hospital as they have to wait for their husbands to schedule a time that will be convenient for them to accompany them to the hospital.

The practice of polygamy among this group of people, could also be one of the reasons for high prevalence of cervical premalignant and malignant lesions, this result is in accordance with the research of Mbulaiteye et al. [24]. As it has been established that having multiple sexual partners probably increases the risk of acquiring HPV infection and in turn the development of cervical precancer and cancer, the risk factor of women in purdah studied in this research as to this could be said to be low (90% of them have  $\geq 2$  lifetime sexual partners) in comparison to women from other reports. In Cote D'Ivoire 56% of the women were reported to have  $\geq 5$  lifetime

sexual partners and in South Africa the median number of sexual partners was 4 Mbulaiteye et al. [24]. Nevertheless, women in purdah could still be said to be at risk due to this factor as their husbands are permitted to have up to 4 wives, hence 4 sexual partners at a time.

The women in purdah have low incidence of the husband specifying the number of children they are supposed to have (16.7%) and when they are supposed to stop having children (35.5%). This can be attributed to their common belief that the number of children one is meant to have is already predestined by God, hence one should not interfere with His divine decree. In contrast to this, this research found out that these women have used contraceptives at some point in their lives (64.0%). Similarly, high use of contraceptives (55.0%) was also reported among women in purdah by Adisa et al. [1]. A balance could be reached between both findings that even though their husbands do not specify the number of children they are to have, these contraceptives are possibly used for child spacing rather than limiting the number of children they are to have.

This study also found out that the risk of cervical cancer is greater in ages higher than 40 years, which supports the natural history of cervical carcinogenesis for HPV infection through cervical dysplasia, pre cancer and cancer.

## 5. CONCLUSION

The prevalence of cervical lesions in HIV positive women in purdah (42.0%) is higher than that of HIV negative women not in purdah (16.0%), but lower than that of HIV positive women not in purdah (56.0%). HIV positive women in purdah had the lowest knowledge of cervical cancer with a mean score of (27.3%) while the control groups had a higher knowledge of 86.0% and 76.7% respectively. This implies that there is need for comprehensive and correct knowledge, positive attitude/ beliefs and positive behavioral practice are important in the control of cervical cancer and diseases in general. This study has shown that there is virologic synergy between HIV and HPV infection, thereby increasing the risk of HPV and HPV related diseases including cervical cancer. In conclusion the result of this study implies that being in purdah does not put this group of women at more risk of developing cervical cancer than their counterpart, who are not practicing purdah.

## CONSENT AND ETHICAL APPROVAL

Ethical clearance and approval was issued by the Ethics committee of the Federal Teaching Hospital, Gombe. Informed consent was sought from the participating subjects, Objective and procedure of research was explained to the subjects.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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