

## **Influential Factors in Pelvic Inflammatory Disease Prevalence Among Sexually Active Women at Kampala International University-Western Campus, Ishaka-Bushenyi, Uganda**

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### **ABSTRACT**

PID is a significant public health issue among sexually active women, with silent PID being a major diagnostic and treatment challenge. A 2008 study estimated an average direct medical cost of \$3,202 per case of PID. A quantitative, cross-sectional, descriptive study was conducted to assess the factors influencing the prevalence of PID among sexually active women attending OBS/GYN clinics at KIU-TH. The study found that 45.6% of sexually active women at KIU-TH had PID, with 80.6% having their first intercourse at 18 years of age, 19.4% starting between 15-18 years, and 90.6% preferring pills or withdrawal for contraception. 51.9% attended government healthcare, while 56.2% used government facilities. Most PID patients reached within one hour or less than 30 minutes. Only 38.7% could meet their bills without insurance. Most patients agreed that health sensitization is essential, and 96.9% received counseling and professional advice. 62.5% of PID affected women were under 35 years old, 35.5% were unemployed, and 59.3% earned  $\leq 50,000/=$  and had secondary education. The prevalence of PID among sexually active women at KIU-TH is 45.6%.

**Keywords:** prevalence, pelvic inflammatory disease, sexually active women

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### **INTRODUCTION**

Pelvic Inflammatory Disease is a clinical syndrome characterized by infectious and inflammation of the female upper genital tract. It involves any of these; endometritis, oophoritis, salpingitis, myometritis, or peritonitis. Acute PID refers to any acute symptoms accompanying the ascending infection from the cervix to the endometrium, fallopian tubes, ovaries and or pelvic peritoneum.

In the National Health and Nutrition Examination Survey 2013–2014 cycle, the prevalence of a self-reported lifetime PID diagnosis was 4.4% among sexually experienced reproductive-aged women, equating to 2.5 million prevalent PID cases in women aged 18–44 years nationwide. This varied by sexual behaviors and sexual health history and differed by race/ethnicity in women without a prior STI diagnosis, black women were 2.2 times that among white

women if no previous STI was diagnosed (6.0% versus 2.7%). women whose age of sexual debut was  $<12$  years was approximately eight times that of women whose age of sexual debut was  $\geq 18$  years, women with  $\geq 10$  lifetime male vaginal sex partners were approximately three times that of women with a single partner (PR = 3.6). women reporting a previous STI diagnosis was approximately three times that of women without a previous STI diagnosis (PR = 3.3) [1]. Women who never married and women who are divorced or separated are at increased risk of PID, urban residence is often suggested to be associated with increased risk of PID, but no studies have compared PID rates among urban and rural populations. increased risk for PID occurs in the first months after insertion of an IUD though lower risks of PID have been reported with the current generation of

IUDs than with types used in earlier years [2, 3].

In Africa, especially in sub-Saharan countries, the incidence is not well known and might be higher than the reported incidence of between 0.28% and 1.67% worldwide because the majority of cases are subclinical. Thus, affecting the true

prevalence. A study conducted between October 1st, 2013 and March 31st, 2014 in the gynecologic units of the University Teaching Hospital and the Central Hospital, Yaoundé (Cameroon), 5.2% was the established prevalence of acute PID, [4].

## METHODOLOGY

### Study Design

This was a cross-sectional descriptive study [5] where the prevalence and factors influencing the prevalence of PID among sexually active women, was carried out.

### Study Area

The study was conducted at KIU-TH, Ishaka-Bushenyi district, Runyankole is the language used in this area, though some other related Bantu language is spoken, like Luganda.

### Study Population

This included women of reproductive age who was attending gynaecology outpatient and gynaecology ward at KIU-TH.

### Inclusion criteria

- This involved woman of reproductive age who attended gynaecology outpatient and ward.
- Within the period of research time.
- Those who have consented to participate in this research.

### Exclusion criteria

Pregnant women, not of reproductive age neither attend KIU-TH gynaecology outpatient clinic nor admitted on ward for PID,

Those who have not consented to participate.

Those who have not come within the period of research time scope.

### Sample Size Determination

The sample size was determined using Kish Leslie (1965) formula:

$$n = z^2 p (1-p) / E^2$$

Where;

n=estimated minimum sample size required.

p=proportion of a characteristic in a sample (P=11.1% according to [6])

z=1.96(for confidence interval)

e=margin of error set at 5%

$$n = 1.96^2 * 0.111(1-0.111) / 0.05^2$$

$$n = 151.63409856$$

However, using the "Finite Population Correction for Proportions" formula

$$n = \frac{n_1}{1 + \left(\frac{n_1 - 1}{N}\right)}$$

where;

N is the population size (for this case number of women of reproductive age at the hospital, = (Ward, 135+20 at OPD) =155) and n1 is the sample obtained above;

Sample size was;

$$\frac{151.63409856}{1.971832893935484} = 76.90007557251009$$

Therefore, 77 women were sampled.

### Sampling Technique

The simple random sampling technique was used. This involved every individual in the target population has an equal chance of being part of the sample. To show that it is a true reflection of the technique, I obtained the complete list of the population, randomly select individuals from that list for the sample and the individuals must reflect the unit of analysis.

### Data Analysis

Data was analyzed using statistical package of Microsoft excel spread sheet and information summarized in the form of percentages or tables to give descriptive statistics as per the theme of the study [7].

### Ethical Consideration

Approval was obtained from KIU Research Ethics Committee. Also, an approval from relevant hospital authorities was obtained before accessing their documents. Written informed consent was taken from all women interviewed. Confidentiality of information was guaranteed by using codes instead of names [8].

## RESULTS

**Table 1: Measures of Central Tendency and Dispersion of the socio-demographic of the study participants**

Parameters		Age (years)	Occupation	Education attainment	Monthly income level
N	Valid	77	76	77	66
	Missing	0	1	0	11
Mean		1.325	1.526	1.558	1.394
Median		1.000	2.000	2.000	1.000
Std. Deviation		0.4713	0.5026	0.4998	0.4924
Variance		0.222	0.253	0.250	0.242

Statistics (N=77)

**Table 2: Soci0-demographic Characteristics of the Study Characteristics**

Variable		Frequency (n=77)	Percentage (%)
Age (years)	<35	52	67.5
	35 Or more	25	32.5
Occupation	Employed	36	46.8
	unemployed	41	53.2
Education attainment	Primary level or less	34	44.2
	Secondary level or greater	43	55.8
Monthly income level	50,000 or Less	40	51.9
	> 50,000	26	33.8
	Not sure	11	14.3

According to this study findings, majority 52(67.5%) of the study participants were less than 35 years of age compared to their counterparts 25(32.5%) who were 35 years or more. 41(53.2%) were unemployed with a considerable number

34 (44.2%) who reached only primary level of education or less meanwhile majority 43(55.8%) attained secondary education or greater; Majority 40(51.9%) with only 26(33.8%) earning more than 50,000/= per month.

**Table 3: Prevalence of PID among sexually active women attending KIU-TH**

VARIABLE		Frequency (N)	Percentage (%)
Self-reported previous diagnosis of PID	Yes	49	63.6
	No	28	36.4

From table 3 above, majority 49(63.6%) of the sexually active women (study participants) reported having previously

diagnosed and suffered from pelvic inflammatory Disease (PID)

DIAGNOSTIC SIGNS AND SYMPTOMS EXHIBITED BY THE ARTICIPANTS

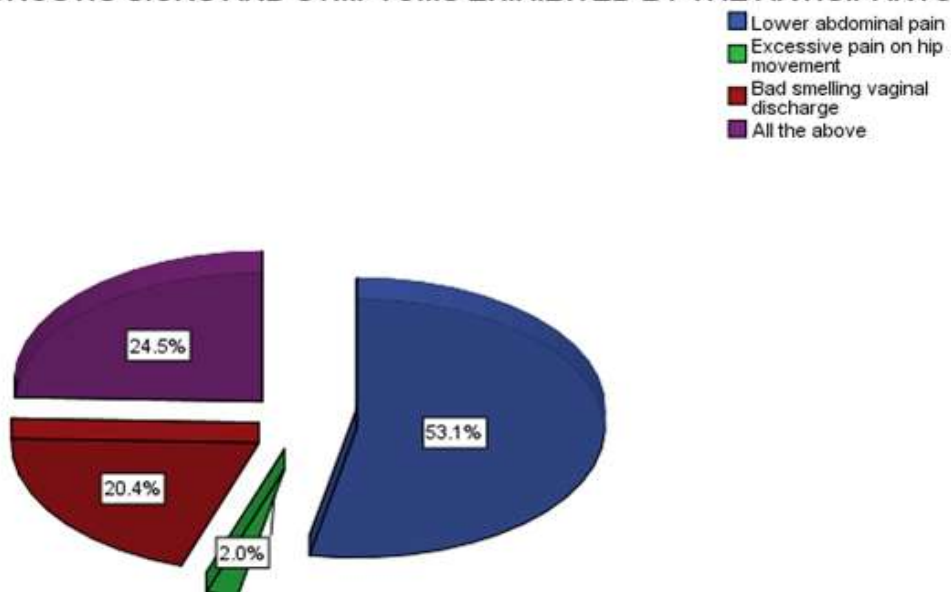


Figure 1: Diagnostic Clinical Manifestations

As shown on fig. 1; 53.1% reported to have experienced abdominal pain; 20.4% had a bad smelling vaginal discharge, 2.0% reported excessive pain on hip

movement (adnexal tenderness) whereas 24.5% experienced a combination of these signs and symptom.

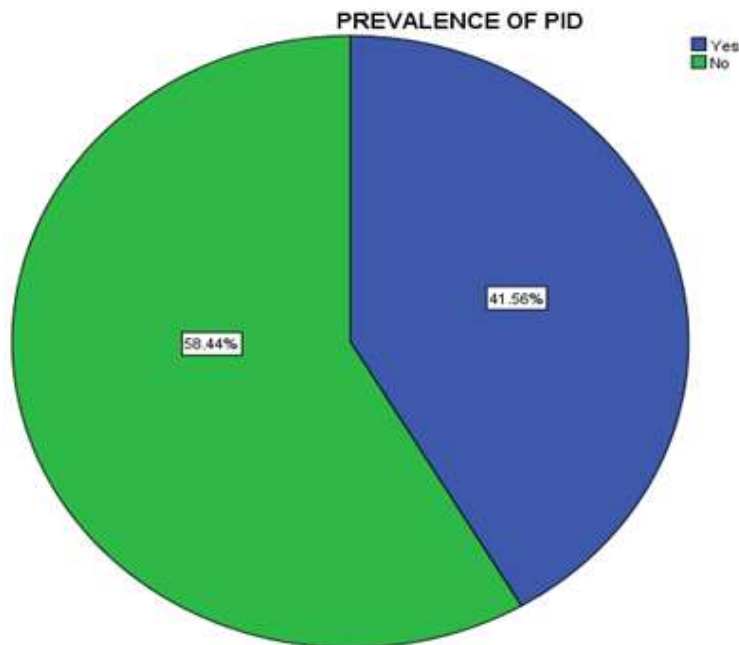


Figure 2: Prevalence of PID among sexually active women attending OBGY clinic at KIUTH

The prevalence of PID as illustrated on fig. 2; stands at 45.6% whereas majority (58.4%) were found to be free from PID at the time of this study. The diagnosis was based on possession of a combination of the diagnostic signs and symptoms as

illustrated on fig. 1 coupled with previous laboratory diagnosis of PID

4.2 The individual factors influencing the prevalence of PID among sexually active women attending OBS/GYN clinic at KIU-TH.

**Table 4: Showing the Cross-Tabulations of individual factors with PID among the sexually active women attending KIU-TH**

Variable	Sexually active with		Total [n/%]	P-Value	Odds Ratio(C.I)	
	PID [n/%]	NO PID[n/%]				
Age at first intercourse (years)	< 15	0(0.0%)	2 (4.4%)	2(2.6%)	0.22	-
	15 - 18	6 (19.4%)	14 (31.1%)	20 (26.3%)	0.21	0.5(0.17-1.49)
	18	25 (80.6%)	29 (64.4%)	54 (71.1%)	Ref	1
Number of sexual partners	1	26 (89.7%)	34 (85.0%)	60 (87.0%)	0.57	1.53(0.35-6.7)
	>1	3 (10.3%)	6 (15.0%)	9 (13.0%)	Ref	1
Sexually transmitted disease	Treated	10 (45.5%)	10 (37.0%)	20 (40.8%)	0.55	1.41(0.45-4.46)
	Not treated	12 (54.5%)	17 (63.0%)	29 (59.2%)	Ref	1
Contraceptive used	Condom	3 (9.4%)	11 (24.4%)	14 (18.2%)	<b>0.09</b>	<b>0.32(0.08-1.26)</b>
	Other, included pills, withdrawal	29 (90.6%)	34 (75.6%)	63 (81.8%)	Ref	1

Majority 25(80.6%) of the sexually active women in this study had their first intercourse at 18 years of age, with a few 6(19.4%) who started between 15-18 years. Similarly; of the 45.6% who had PID, a great number 25(80.6%) had a single sexual partner. Of those previously with

STDs, only 10(45.5%) reported to successful have treated it whereas 12(54.5%) never got treated. Similarly, a considerable number 29(90.6%) preferred other contraceptive options including pills and/or withdrawal and 3(9.4%) [P-value=**0.09 OR 0.32(0.08-1.26)**]

**Table 5: Showing the Cross-Tabulations of utilization of health services with PID among the sexually active women attending KIU-TH**

Variable		Total [n/%]		P-Value	Odds Ratio(C.I)		
		PID [n/%]	NO PID[n/%]				
Health facility attended	Government	18 (56.2%)	22 (48.9%)	40 (51.9%)	0.52	1.34 (0.54-3.34)	
	Private	14 (43.8%)	23 (51.1%)	37 (48.1%)	Ref	1	
	Means of Transport to health facility	Walking	4 (12.5%)	7 (16.3%)	11 (14.7%)	0.48	0.57 (0.12-2.70)
		Motorcycle	15 (46.9%)	25 (58.1%)	40 (53.3%)	0.53	0.70 (0.23-2.14)
		Motorcar	13 (40.6)	11 (25.6%)	24 (32.0%)	Ref	1
Time to reach	< 30 mins	<b>13 (40.6%)</b>	<b>30 (69.8%)</b>	<b>43 (57.3%)</b>	<b>0.04</b>	-	
	1 hour	14 (43.8%)	10 (23.3%)	24 (32.0%)	0.90	0.89 (0.16-4.93)	
	>1 hour	5 (15.6%)	3 (7.0%)	8 (10.7%)	Ref	1	
Meet bills	Yes	<b>12 (38.7%)</b>	<b>27 (67.5%)</b>	<b>39 (54.9%)</b>	<b>0.02</b>	<b>0.30 (0.11-0.81)</b>	
	No	19 (61.3%)	13 (32.5%)	32 (45.1%)	Ref	1	
Who else meets your bills	Insurance Company	<b>0 (0.0%)</b>	<b>5 (21.7%)</b>	<b>5 (10.6%)</b>	<b>0.01</b>	-	
	Relatives	8 (33.3%)	2 (8.7%)	10 (21.3%)	0.68	1.24 (0.46-3.34)	
	Government	16 (66.7%)	16 (69.6%)	32 (68.1%)	Ref	1	
Health sensitization	Yes	31 (96.9%)	43 (95.6%)	74 (96.1%)	0.77	1.44 (0.13-16.62)	
	No	1 (3.1%)	2 (4.4%)	3 (3.9%)	Ref	1	
Given counseling & professional advice	Yes	31 (96.9%)	40 (88.9%)	71 (92.2%)	0.20	3.88 (0.43-34.00)	
	No	1 (3.1%)	5 (11.1%)	6 (7.8%)	Ref	1	
Services cover STIs Prevention	Yes	<b>31 (100.0%)</b>	<b>34 (89.5%)</b>	<b>65 (94.2%)</b>	<b>0.06</b>	<b>0.52 (0.42-0.66)</b>	
	No	0 (0.0%)	4 (10.5%)	4 (5.8%)	Ref	1	
Can STIs be Prevented	Yes	<b>29 (90.6%)</b>	<b>38 (88.4%)</b>	<b>67 (89.3%)</b>	<b>0.76</b>	<b>1.27 (0.28-5.76)</b>	
	No	3 (9.4%)	5 (11.6%)	8 (10.7%)	Ref	1	

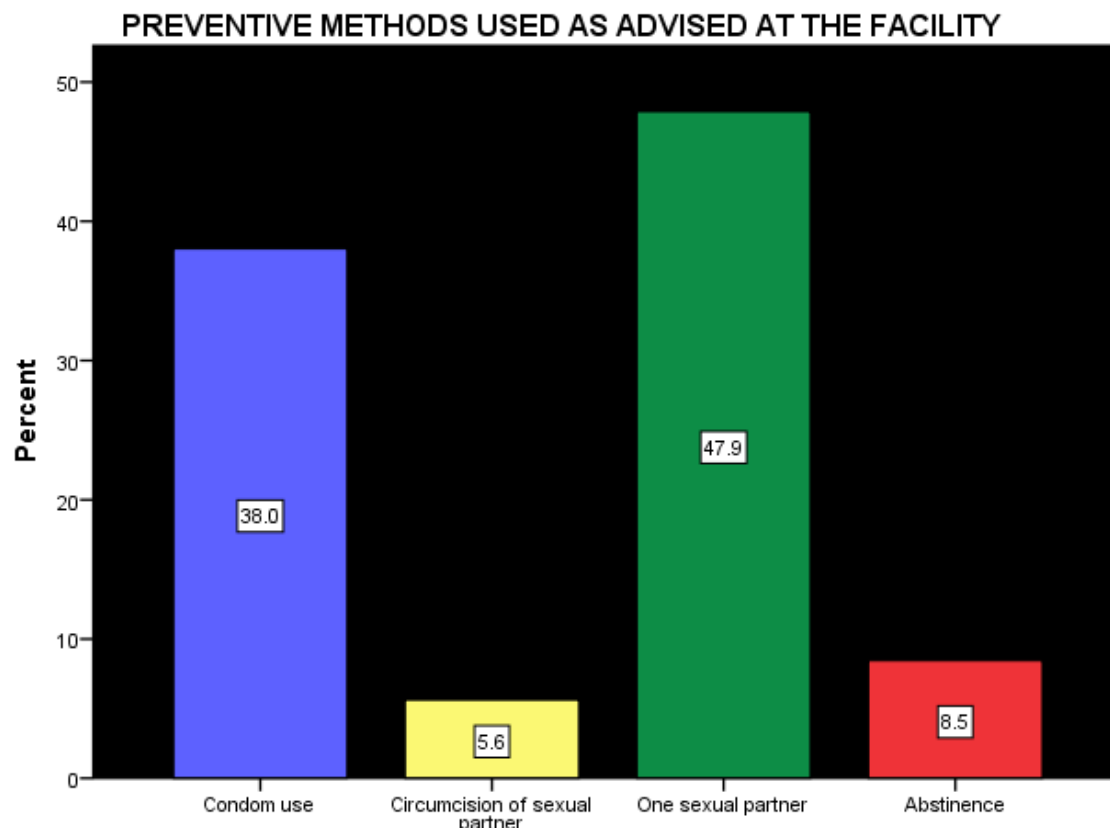
Concerning utilization of the health services effect on PID among sexually active women; table 5 show that; generally majority 40(51.9%) compared to 37(48.1%) who get to private facilities. Similarly, majority 18(56.2%) of those with PID use Government facility; mostly 14(46.9%) using a motorcycle and mostly 14(43.8%) reaching within one hour and a significant number (p-value=0.04) of those with PID 13(40.6%) reached in less than 30 minutes.

Only 12(38.7%) [P-value=0.02, OR=0.30(0.11-0.81)] of those diagnosed

with PID meet their bills; with none 0(0.0%) [P-value=0.01] uses insurance company.

Majority 31(96.9%) agreed that there is always health sensitization and similarly 31(96.9%) given counseling and professional advice.

Generally, the health service offered cover STIs 65(94.2%) [P-value=0.06, OR=0.52(0.42-0.66)]. thus STIs can be prevented [67(89.3%); OR=1.24(0.28-5.76)].



**Figure 3: Preventive Measures/Methods used as advised at the facility among sexually active women attending OBGYN Clinic at KIUTH**

Following the health workers’ advise, majority (47.9%) of the study participants reported having one sexual partner as their preventive measure/method;

followed by condom use (38%), abstinence (8.5%) and only 5.6% had a circumcised sexual partner.

**Table 6: Showing the Cross-Tabulations of socio-demographic factors with PID among the sexually active women attending KIU-TH**

Variable	PID [n/%]		Total [n/%]	P-Value	Odds Ratio	
	PID [n/%]	NO PID[n/%]				
Age (years)	<35	20(62.5%)	32(71.1%)	52 (67.5%)	0.43	0.68(0.25-1.77)
	35 Or more	12(37.5%)	13(28.9%)	25 (32.5%)	Ref	1
Occupation	Employed	11 (35.5%)	25 (55.6%)	36 (47.4%)	0.08	0.44(0.17-1.13)
	Unemployed	20 (64.5%)	20 (44.4%)	40 (52.6%)	Ref	1
Education attainment	≤Primary	13(40.6%)	21 (46.7%)	34 (44.2%)	0.60	0.782(0.31-1.96)
	≥Secondary level	19 (59.4%)	24 (53.3%)	43 (55.8%)	Ref	1
Monthly income level	≤50,000	16 (59.3%)	24 (61.5%)	40 (60.6%)	0.85	0.91(0.33-2.48)
	> 50,000	11 (40.7%)	15 (38.5%)	26 (39.4%)	Ref	1

From the cross tabulation of the relationship between the socio-demographic and PID among the sexually active women; as shown in table 6,

statistical significance was observed with <35 years of age comprising of 20(62.5%) [P-value=0.43; OR=0.68(0.25-1.77)]; occupation especially the unemployed

20(35.5%); education level,  $\geq$ Secondary level 19 (59.4%) [P-value 0.06, OR0.78 (0.31-1.96)] as well the monthly income

level,  $\leq$ 50,000 being 16 (59.3%) [P-value=0.85, OR=0.91(0.33-2.48)].

## DISCUSSION

According to this study, the prevalence of PID stands at 45.6%. this was too way higher compared to the findings from a similar study by [6] which concluded that STIs prevalence was 11.1%, being due to *Trichomonas Vaginalis*, *Nisseriae Gonorrhoeae*, and *Chlamydia trachomatis* was 5.9%, 5.4% and 0.9% respectively. The same applies to self-reported PID prevalence (63.6%) unlike the recently reported findings by [9] which was too low 10.0% and 10.3% in the whites and blacks in the US, respectively. In this study, diagnosis was based on possession of a combination of the diagnostic signs and symptoms coupled with previous laboratory diagnosis of PID. These included experienced abdominal pain; 20.4% had a bad smelling vaginal discharge, 2.0% reported excessive pain on hip movement (adnexal tenderness) whereas 24.5% experienced a combination of these signs and symptom.

According to the study in Nigeria majority of the respondents attained coitarche between the ages of 15 and 19 years but those whose sexual debut was before 15years all had PID. In contrary, current study revealed that Majority (80.6%) of the sexually active women in this study had their first intercourse at 18 years of age, with a few (19.4%) who started between 15-18 years. Nonetheless, it complements findings by [10, 11, 12] in which it was generally concluded and documented those age < 20 years as a major risk factor for the development of PID.

Similarly; of the 45.6% who had PID, a great number 25(80.6%) had a single sexual partner. This is in congruence with [13]; which revealed that women who had four or more sexual partners in six months were 3.4 times more likely to develop PID than women with one sexual partner, owing to the established fact from [13] that women who have frequent sexual intercourse are at increased risk for infection and PID. Also, those previously with STDs, considerably reported to successfully have treated it implying they may not get to continue owing to availability of medications. This

in one-way complements [14]; a study on university students revealed that sexually active female students preferred contraceptive pills for they were majorly (42.3%) user friendly compared to other methods.

In the same way, [15] revealed that; in Uganda, the most commonly known & used modern methods were condoms (88.4 %), followed by contraceptive pills (86.7 %). Similarly, to a considerable extent (90.6%) preferred other contraceptive options including pills and/or withdrawal. However, in disagreement to [16] only (9.4%) preferred a condom; this as well explains findings in a study among Kenyan sexually active women which indicated that their most preferred contraceptive methods being traditional methods, withdrawal (34.2%), short term methods such as condoms (31.2%) and only 6.4% for long-term methods [17].

Overall, [18] stipulates that the absolute risk of pelvic infection is small (1.6 cases per 1,000 woman-years in a meta-analysis) the benefits of contraception outweigh the risks.

According to the current study, majority (51.9%) attend government healthcare compared to (48.1%) who get to private facilities. This agrees with [19] in which it was concluded that there is low healthcare utilization (46%) due to few health care facilities and being located over three hours away from the next higher level referral facility. Also; despite 99% hospitals/HCIV reporting availability of laboratory services, only 12% of them provide culture and sensitivity services [19]. Similarly, [20] showed distance >10km to the nearest health facility (14.35 times) was found to be strong associated factor to progression of infections.

In this current study, it was contrary to the above in that majority (56.2%) of those with PID used Government facility; mostly (46.9%) using a motorcycle and mostly 14(43.8%) reaching within one hour and a significant number (p-value=0.04) of those with PID (40.6%) reached in less



than 30 minutes. Complementing [21]; a study in Ethiopia which concluded that a big percentage (90%) of the study population could easily access healthcare service in which many mentioned that they could walk for less than 30 minutes to access the health facility.

However, according to [22] report in many rural areas and low-income parts of central cities, public transportation services are inadequate or completely lacking, making access to medical care by alternative means difficult or impossible; yet only (38.7%) of those diagnosed with PID could meet their bills; with none (0.0%) on insurance company. Nonetheless, Medical insurance is among the most important determinants of access to care. [23] way long back stipulated that this is as well an important usual source of care, use of physician visits, and blood pressure screening.

Majority (96.9%) agreed that there is always health sensitization and similarly (96.9%) given counselling and professional advice. This supplements recommendations by [24] in which three areas of focus for information collection and analysis for effective humanitarian health coordination were identified being data on the health status of the population, the availability of health resources and services, and the performance of the health system. Luckily enough, the health service offered cover STIs (94.2%) thus STIs could effectively and massively be prevented (89.3%).

According to this study, the prevalence of PID among sexually active women at KIU-TH stands at 45.6%. it is protective to have early health seeking behaviour; having health sensitisation, counseling and guidance with professional advice on STIs, STDs and PID in particular.

However, poor sexual behaviour including early age sexual intercourse and multiple

According to [25]; it was concluded that sexually active women in the age group of 35-40 yrs were over four times more likely to use contraceptives during sexual intercourse compared to the younger aged sexually active women thus in this current study; it was observed that those <35 years of age were highly affected comprising of (62.5%) of PID diagnosed individuals. Further agreeing with [12] in which it was documented that age < 20 years being a major risk factor for the development of PID. Additionally, NHANES 2013-2014, stipulated that the lifetime PID prevalence in sexually active women aged 18-44 years was higher than in those with a younger sexual debut.

Just like previously concluded by [26]; that association between Chlamydia infections was equivocal from occupational class in women in Britain but stronger for measures of unemployment in household survey. Similarly, in this study; majority 20(35.5%) of the sexually active women with PID were unemployed probably due to low monthly income level since majority (59.3%) earn  $\leq 50,000$  /= which could not enable them afford better health care standards. Similarly, more than  $\frac{1}{2}$  (59.4%) of the sexually active women with PID had education level,  $\geq$  Secondary level contradicting with [26] which concluded that Lower educational opportunity or attainment was associated with increased risk of infection thus PID.

## CONCLUSION

partners especially before 35 years. Use of pills and withdrawal for contraception; poor access and inavailability of government healthcare services near the people as well as lack of insurance continues to give way to PID and related conditions.

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