Scicom Journal of Medical and Applied Medical Sciences
Scicom J Med Appl Med Sci, 3(1): 45-50 (2024)
DOI: https://doi.org/10.54117/sjmams.v3i1.13

Prevalence of Pelvic Inflammatory Disease among Women of Reproductive Age Attending Gynaecology Clinic at Lagos State University Teaching Hospital, Ikeja, Lagos

Rosemond Chidimma Iwu[1*], Dorcas Chika Amie[1], Oruese Abigail Eduwa[2], Monsurat Abiodun Sanusi-Borokini[2], Felicia Adedoyin Augustine[2] and Alice Olukemi Zakari[3]

[1]Department of Nursing, Faculty of Clinical Sciences, Lagos State University College of Medicine, Ikeja, Lagos.
[2]Department of Midwifery, Lagos State College of Nursing, Igando, Lagos.
[3]Department of Nursing, Lagos State College of Nursing, Igando, Lagos.

*Correspondence e-mail: rosemond.iwu@lasucom.edu.ng; Tel.: +234(0)8064652212

Received: 24 Oct 2024 **Accepted:** 06 Nov 2024 **Published:** 23 Dec 2024

Abstract

Pelvic inflammatory disease (PID) is a polymicrobial infection of the female upper genital tract, mostly caused by *Neisseria gonorrhoea* and/or *Chlamydia trachomatis*, while other endogenous flora from the vagino-cervical areas might also be implicated. This study examined the prevalence of PID among women of reproductive age attending Gynaecology Clinic at Lagos State University Teaching Hospital (LASUTH). The study adopted a cross-sectional research design. A total of 218 respondents participated in the study. A 43-item questionnaire was used for data collection, and then analyzed using the statistical package for social sciences (SPSS) version 25 while adopting Chi square for the inferential statistics. Results of the study showed that there was high prevalence of PID 164(75%) among the respondents and 120(55%) had treated the disease previously. The study also revealed that the respondents had poor knowledge about the risk factors and effects of PID; they understood that lower abdominal pain 174(80%) and foul smelling discharge 164(75%) were the major experienced symptoms. Whereas 131(60%) disagreed that multiple sexual partners could cause it. Similarly, 179(82%) were undecided on whether PID could cause complications in pregnancy and 159(73%) strongly disagreed that PID can cause infertility. Also, all respondents 218(100%) agreed that use of pain relief and antibiotics could cause PID. Hypothesis testing revealed that there was no significant relationship between the respondents' educational level and their knowledge about PID. Conversely, there was a strong association between the occurrence of PID and the women's age. It was concluded that there is high prevalence of PID among women in Gynecology Clinic at LASUTH (age<25years) who portrayed poor knowledge on the risk factors and effects. It was therefore recommended that the management of LASUTH should invest more time and resources in educating women on the risk factors, preventive measures and complications of PID.

Keywords: *Prevalence, Pelvic Inflammatory disease, Women, Reproductive Age*

How to cite this paper: Iwu, R. C., Amie, D. C., Eduwa, O. A., Sanusi-Borokini, M. A., Augustine, F. A., & Zakari, A. O. (2024). Prevalence of Pelvic Inflammatory Disease among Women of Reproductive Age Attending Gynaecology Clinic at Lagos State University Teaching Hospital, Ikeja, Lagos. *Scicom Journal of Medical and Applied Medical Sciences*, *3*(1), 45–50. https://doi.org/10.54117/sjmams.v3i1.13.

Introduction

Pelvic inflammatory disease (PID) is fundamentally a condition affecting multiple organs, including the ovaries, fallopian tubes, uterus, and endometrium, situated within the upper genital tracts of females. Pathogenic organisms transmitted through sexual contact are responsible for the upward infection of the uterus, fallopian tubes, and ovaries. The main pathogens associated with PID include *Neisseria gonorrhoea* and/or *Chlamydia trachomatis*, are primarily thought to be responsible for the onset of this fatal illness (Naaz, Khan & Mastan, 2016; (Greydanus, Cabral, and Patel, 2021). The uterus, fallopian tubes, and ovaries become infected with sexually transmitted infections. Due to the increased frequency of sexually transmitted infections.

PID is one of the three most common gynecological issues linked to female reproductive disorders, including endometriosis, oophoritis, and fallopian tubal obstruction. These conditions cause 10% of women in the reproductive ages of 25 to 34 to become infertile, and 0.5% of them to die. PID is typically more common in reproductive age groups and in younger women who have many partners (Usman, 2016).

In most developing countries, including Nigeria, urogenital pathogens, particularly enterobacteriaceae (e.g. *Salmonella spp., Klebsiella spp., Pseudomonas spp., Staphylococcus spp., and Proteus spp.),* have been identified over time as part of the aetiology of PID. Previous studies have demonstrated high

prevalence of PID among rural populated women in Asia and India (Naaz, Khan & Mastan, 2016).

PID is a clinical syndrome linked to poor reproductive health outcomes such ectopic pregnancy, infertility, and persistent pelvic pain. A clinical diagnosis of pelvic inflammatory disease is made on the basis of indicators of soreness in the cervix, adnexa, or uterus during an examination, as well as symptoms of lower abdomen pain. When a sexually active individual with a uterus and cervix is diagnosed with PID, there is no other discernible cause. This diagnosis is syndromic. Since pelvic inflammatory disease is a syndrome, its manifestation, degree of severity, and origin are all variable.

Contemporary reports of the prevalence of PID sequelae range from 3% to 7% for infertility and ectopic pregnancies in a military population to 36% for chronic pelvic pain in the PID Evaluation and Clinical Health (PEACH) trial. Diagnosis of PID is based on several clinical symptoms including lower abdominal pain, purulent vaginal discharge, abnormal uterine bleeding and elevated body temperature. In order to detect these pathogens, physicians use the nucleic acid amplification test (NAAT) for real time PCR from endocervical swabs. Oseni and Odewale, (2017), in their work, "Occurrence of Pelvic Inflammatory Disease and Associated Factors Among Undergraduates Attending Irrua Specialist Teaching Hospital, Irrua, Edo State' revealed that PID is a major cause of gynaecological morbidity globally. It is a spectrum of infections that arise commonly from the lower genitalia (vagina and cervix) and ascending to the upper genital tract causing endometritis, salpingitis, oophoritis, tubo-ovarian abscess and/or pelvic peritonitis. They further illustrated that complications from PID include infertility, ectopic pregnancy and chronic pelvic pain. Major risk factors for PID include low socioeconomic status, early coitarche, multiple sex partners, poor or no barrier contraceptive use, young age, history of induced abortion, low parity and past history of PID or Sexually Transmitted Infections.

Statement of Problem

Pelvic Inflammatory Disease is a common cause of gynaecological morbidity worldwide (Oseni and Odewale, 2017). Over 800,000 cases of PID are diagnosed annually in the United States of America (Wariso, Odigie, and Eyaru, 2012). In the United Kingdom, PID was found to contribute to about 2% of annual visit to general practitioners (Ingerslev et al, 2017). A Jamaican study reported a PID prevalence of 17% among women of reproductive age with majority of them from low socioeconomic status. The study also found PID to be higher among those who were sexually assaulted (Bourne, 2016). This is supported by another study also in Jamaica which found PID to be higher among sexually assaulted women from low socio-economic status (Bourne, 2016).

Prevalence of PID in Nigeria is high, particularly among young adults. A study done in Port Harcourt, Nigeria put the prevalence among undergraduates at 11% (Wariso, Odigie, and Eyaru, 2012). In a similar study reported a prevalence of 14% among young women in India. This is small compared to the study by Olowe, Alabi and Akindele (2012) in Osogbo, South-Western Nigeria which reported a PID prevalence of 70%. It is therefore imperative to determine other predisposing factors associated with the prevalence of PID among women of reproductive age attending Gynaecology Clinic at Lagos State University Teaching Hospital Ikeja.

Methodology

Research Design

This study adopted a cross-sectional research design to determine the prevalence of pelvic inflammatory disease among women of reproductive age attending Gynaecology Clinic at Lagos State University Teaching Hospital Ikeja.

Study Area

The study was conducted at Gynaecology Clinic, LASUTH. The Lagos State University Teaching Hospital Ikeja emergred from a modest cottage hospital which was established 25th of June, 1955 by the old Western Regional Government to provide health care services for the people of Ikeja and its environs. The cottage hospital later metamorphosed into a full-fledged general hospital which served as a secondary level health care facility. The hospital is equipped with a variety of medical and surgical training programs. It also provides a variety of services such as obstetrics and gynaecology, internal medicine, pediatrics, surgery, psychiatry, ophthalmology, pathology, and community health. It is also the site of a state-of-the-art Lassa Fever Research and Control lab. Furthermore, it serves as a teaching hospital to Lagos State University Medical School which is a state-owned institution. The Gynaecology Clinic of this hospital was used as a point of study because it caters to the health and well-being of female reproductive health.

Study Population

Study population included all females within the reproductive age (18 to 49 years) attending Gynae Clinic in Lagos State University Teaching Hospital Ikeja, Lagos.

Sample Size Determination

The sample size (n) in this study was determined using Cochran's sample size formula for population greater than 10,000 people, sample size will be calculated using the formula

$n = z^2pq/d^2$

n= the desired sample size (when population is greater than 10,000)

z= the standard normal deviate, usually set at 1.96 which corresponds to the 95% confidence level

p = According to a study of Oseni & Odewale (2017) on the occurrence of Pelvic Inflammatory Disease and Associated Factors Among Undergraduates Attending Irrua Specialist Teaching Hospital, Irrua, Edo State, out of the 270 female undergraduates studied, 229 (85.0%) had PID.

Therefore,

q= 1-p = 0.15

d= degree of accuracy desired, usually set at 0.05

$n= 1.96^2\times0.85\times0.15/0.05^2$

n= 195. 92

Non-response rate

Adjusting for 10% non-response rate

N= n / (1-0.1)

N= **195.92**/0.9e

N=218.

Sampling Technique
A census sampling technique was used for this study.

Instrument for Data Collection
A 43-item questionnaire was developed by the researchers based on the literature reviewed and research objectives, which was used for data collection. The questionnaire was developed by the researcher based on the literature reviewed and research objectives. It was structured into four sections, labeled A-D. Section A elicited the socio-demographic data of respondents, consisting of 3 items. Section B was used to obtain data on the prevalence of pelvic inflammatory disease, consisting of 16 items. Section C assessed the respondents' knowledge of pelvic inflammatory disease, consisting of 15 items. Section D measured the risk factors for pelvic inflammatory disease, consisting of 9 items.

Validity and Reliability of Instrument
The questionnaire was developed from the reviewed literature in line with the study objectives and research questions. The instrument was presented to the research supervisor for assessment to ensure face validity, confirming it had a good representation of the study. Content validity was ensured by covering all relevant aspects of the subject being measured, with feedback received on how each question measured the construct in question. Reliability was established using a test-retest method, where the instrument was administered to 39 women of reproductive age. This was done to reduce measurement error and confirm that respondents interpreted the questions correctly. No revisions were necessary, as the test-retest confirmed the questionnaire accurately measured all variables under study. Calculated reliability coefficient was 0.7%.

Method of Data Collection
The process of data collection took about two weeks. The sample size was proportionally allocated based on the department and level of each respondent. The questionnaire was shared with women of reproductive age who met the inclusion criteria. Prior to the administration of the questionnaire, the purpose of the research was explained to the participants, and consent was obtained from those who signed the consent form before the questionnaires were administered. Finally, the questionnaire was administered by the researcher to the participants during their visit to the Gynaecology Clinic at Lagos State University Teaching Hospital and collected upon completion.

Procedure for Data Analysis
The collected data were organized and manually sorted before analysis. The quantitative data were analyzed using IBM SPSS Statistics Software 25. Descriptive statistics, such as percentages and frequencies, were used to analyze Objective (i) and Objective (ii), and the results were presented in tables and figures where appropriate. Objective (iii) was achieved using mean scores based on Likert scale ratings. Hypotheses I and II were tested using the Chi-square test of independence. The null hypothesis was rejected if the p-value was greater than 0.05, and accepted if the p-value was less than 0.05.

Ethical Consideration
An application was sent to the ethical review committee of Lagos State University Teaching Hospital Research Ethics Committee (LASUTHREC) who gave an approval with number LREC/06/1993 for the study to be conducted. All respondents were informed about the reason and benefits of the study and given a choice to either participate or not participate. Consent of respondents was obtained verbally and the confidentiality of data collected was assured and maintained throughout the course of the study.

Results

Demographic Characteristics of the Respondents

Age
The results from Table 1 revealed that a considerable number, 108 (49.5%) of the study population, are between 18-30 years of age, followed by 92 (42.2%) of them between 31-40 years of age. A smaller proportion, 18 (8.3%), are between 41-49 years of age respectively.

Level of Education
The results from Table 1 showed that 48 (22.0%) of the respondents had SSCE qualifications, and 48 (22.0%) had OND/NCE qualifications. A higher number, 56 (25.7%), had HND/B.Sc. qualifications, while none had M.Sc. qualification. Additionally, 66 (30.3%) of the respondents reported having other qualifications.

Marital status
Less than half 68 (31.2%) of the respondents were single, while the majority, 150 (68.8%), were married. (Table 1).

From Table 2 above, it was revealed that 164 (75%) of the respondents have been diagnosed with PID while 54 (25%) of the respondents have not been diagnosed with PID. 120 (55%) of the respondents have also treated PID before while 98 (45%) have never treated PID. The result also proves that heavy bleeding is one of the clinical manifestations of PID amongst those who have been diagnosed with PID with 196 (90%) of the respondents agreeing to have had heavy bleeding due to PID. Another 164(75%) participants reveal to have had foul smelling discharge which alerted them to seek medical intervention before been diagnosed of PID. 131(60%) of the respondents reported genital ulcer, 153(70%) of the respondents reported vagina itching, 174(80%) respondents reported lower abdominal pains and 164(75%) respondents reported menstrual cramp.

From Table 3, the result showed that majority of respondents do not possess enough knowledge about pelvic inflammatory disease. This is evident in the part where 131(60%) of the respondents do not agree that having multiple sex partners can cause PID. 174 (80%) of the respondents were also undecided on the right answer to give if abortion can lead to PID or not. 179(82%) of the participants were undecided on the right answer to give where they were asked if they knew that PID can cause complication in pregnancy. The result of table 3 above showed that the women of reproductive age who attend the Gynaecology Clinic of Lagos State University Teaching Hospital possessed inadequate knowledge of causes, preventive methods and implications of PID in women

Table 1: Socio-demographic Characteristics of Respondents (n = 218)

Socio-demographic characteristics	**Frequency**	**Percentage (%)**
Age		
18-30 years	108	49.5
31-40 years	92	42.2
41-49 years	18	8.3
Total	218	100.0
Educational level		
SSCE	48	22.0
OND/NCE	48	22.0
HND/B.Sc	56	25.7
M.Sc	-	-
Others	66	30.3
Total	218	100.0
Marital status		
Single	68	31.2
Married	150	68.8
Total	218	100.0

Table 2: Prevalence of Pelvic Inflammatory Disease among Women in LASUTH (n=218)

Variables	**Yes**	**No**
Have you ever been diagnosed of PID	164 (75%)	54 (25%)
Have you ever treated PID	120 (55%)	98 (45%)
Lower abdominal pain	174(80%)	44(20%)
Heavy bleeding (Menorrhagia)	196 (90%)	22(10%)
Inter menstrual bleeding (Metrorrhagia) menstruation occurs more than once a month	153(70%)	65(30%)
Menstrual cramp (Dysmenorrhea)	164(75%)	54(25%)
Infrequent menstruation (Oligomenorrhoea beyond 35-90days)	87(40%)	139(60%)
Heavy vaginal discharge	159(73%)	59(27%)
Vaginal discharge	153(70%)	65(30%)
Vulvo vaginal irritation (pain in genital area:	174(80%)	44(20%)
Vulvo vaginal itching:	153(70%)	65(30%)
Presence of Genital Ulcers:	131(60%)	87(40%)
Are ulcers painful?	116(53%)	102(47%)
Painful intercourse (Dyspareunia)	153(70%)	65(30%)
Foul smelling discharge	164(75%)	54(25%)

Table 3: Knowledge of Pelvic Inflammatory Disease among Women in LASUTH (n=218)

Variables	**SA (%)**	**A (%)**	**U (%)**	**D (%)**	**SD (%)**
Multiple sex partner can cause PID	-	-	87(40%)	-	131(60%)
PID can cause infertility	-	-	64(28%)	-	159(73%)
PID can be treated	218(100%)	-	-	-	
PID can cause complication in pregnancy	39(18%)	-	179(82%)	-	-
PID can cause ETOPIC pregnancy	76(35%)	-	109(50%)	-	33(15%)
PID can cause painful intercourse	-	-	218(100%)	-	-
PID can cause heavy menstrual bleeding	65 (30%)	-	153 (70%)	-	-
Abortion can lead to PID	44 (20%)	-	174 (80%)	-	-
Unsafe sexual intercourse can lead to PID	-	-	83(38%)	-	135(62%)
Foul smelly vagina discharge can be a sign of PID	-	-	218(100%)	-	-
Barrier contraceptive [condom] can help reduce the risk of contracting PID	-	131(60%)	87(40%)	-	-
Possible sexually transmitted infection (STI) should be tested for and treated by both participants before having sexual intercourse	218(100%)	-	-	-	-
Lower abdominal pain can be caused by PID	87 (40%)	39(18%)	44(20%)		48(22%)
PID could sometimes present no symptoms	87(40%)	-	-	-	131(60%)
Sexually active women of reproductive age should routinely test for STI	218(100%)	-	-	-	-

From Table 4, the results showed some identified risk factors in women of reproductive age who attend Gynecology Clinic, LASUTH as follows: use of pain relief and antibiotics 218 (100%) respectively, use of herbal remedies 172 (79%), abortion 170 (78%), use of contraceptive pill 137 (63%), use of condom 76 (35%) and use of natural methods of contraception 4 (2%).

Table 5 above showed the value of the test statistics to be 3.171. The association between knowledge about PID and educational background of the respondents is shown in the table below. It is evident in the test that there is no statistically significant relationship between knowledge about PID and educational background of the respondents because the calculated p value is higher than our level of significance which is 0.05.

Table 6 shows the value of the test statistic to be 122.906. Because the cross tabulation is a 2x2 table, the degrees of freedom (df) for the test statistic is df=(R−1)∗(C−1)=(2−1)∗(2−1)=1. Our P value is <.001. Based on the decision rule, the chi square table shows a significant relationship between the occurrence of PID and the participants' age because the chosen level of significance (α = 0.05), is higher than our calculated P value of .001.

Table 4: Identified Risk Factors of PID among Women in LASUTH (n=218)

Variables	**Yes**	**No**
Use of condom	76 (35%)	141(65%)
Use of contraceptive pill	137(63%)	81(37%)
Natural method of contraceptive: withdrawal, safe period	4 (2%)	214(98%)
Abortion if any	170(78%)	48 (22%)
use of pain relief	218 (100%)	-
use of antibiotics	218 (100%)	-
use of herbal remedy	172 (79%)	46(21%)

Table 5: Chi Square Test on the Relationship between the Respondents' Knowledge of PID and their Educational Background

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	3.171[a]	2	.105
Likelihood Ratio	3.217	2	.052
Linear-by-Linear Association	1.106	1	.098
N of Valid Cases	**218**		
a. 0 cells (0%) have expected count less than 5. The minimum expected count is 17.76			

Table 6: Chi Square Test on the Relationship between the Occurrence of PID and the Women's Age

Chi-Square Tests					
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (2-sided)**
Pearson Chi-Square	122.906[a]	1	.000		
Likelihood Ratio	136.460	1	.000		
Fisher's exact test				.000	.000
Linear-by-Linear Association	2.811	1	.001		
N of Valid Cases	**218**				
0 cells (0%) have expected count less than 5. The minimum expected count is 65.12. Computed only by 2x2 table					

Discussion

Prevalence of PID in the Women of Reproductive Age in LASUTH

Results of the study showed that PID prevalence was 164(75%) among the respondents. This result is similar to the findings of Olowe, Alabi & Akindele (2012) in Osogbo, South-Western Nigeria who reported a PID prevalence of 70% and that of Oseni & Odewale (2017) on the occurrence of Pelvic Inflammatory Disease and Associated Factors Among Undergraduates Attending Irrua Specialist Teaching Hospital, Irrua, Edo State, out of the 270 female undergraduates studied, 229 (85.0%) had PID. On the other hand, in the study carried out in Port Harcourt, Nigeria by Wariso, Odigie, and Eyaru, (2012) put the prevalence among undergraduates at 11%. A similar study reported a prevalence of 14% among young women in India. This is small compared to the findings above by Olowe, Alabi and Akindele (2012) in Osogbo. The disparity may be due to the difference in knowledge of respondents towards the risk factors and effects of PID. The difference in prevalence could also be attributed to the location as well; Port Harcourt being an urban centre as opposed to Nguru and Osogbo which are semi urban areas. Also, variations in health-seeking behaviour and increased management of PID outside the hospital environment particularly in urban areas could also explain the differences as all the studies with high prevalence were hospital-based.

Level of Knowledge of PID Possessed by the Women of Reproductive Age in LASUTH

The result of research question 2 shows that majority of the respondents 153 (75%) do not possess adequate knowledge of PID despite being educated people while reports shows that

only 65(30%) of the respondents possess adequate knowledge of PID. This means that majority of respondents do not possess enough knowledge about pelvic inflammatory disease. This is because 131(60%) of the respondents do not agree that having multiple sex partners can cause PID. 174 (80%) of the respondents were also undecided on the right answer to give if abortion can lead to PID or not. 179(82%) of the participants were undecided on the right answer to give where they were asked if they knew that PID can cause complication in pregnancy. The result of this study shows that the women of reproductive age who attend the Gynaecology clinic of Lagos State University Teaching Hospital Possesses inadequate knowledge of causes, preventive methods and implications of PID in women.

Identified Risk Factor in Women of Reproductive Age who attend Gynaecology Clinic of LASUTH

In this study, the researchers discovered some identified risk factors among women of reproductive age attending Gynecology Clinic in LASUTH. The results showed some identified risk factors as follows: use of pain relief and antibiotics 218 (100%) respectively, use of herbal remedies 172 (79%), abortion 170 (78%), use of contraceptive pill 137 (63%), use of condom 76 (35%) and use of natural methods of contraception 4 (2%). This indicates that their knowledge on the risk factors of PID is relatively poor.

Relationship between the Knowledge of PID and the Women's Educational Background

It was revealed that, since the p-value was greater than the level of significance ($\alpha = 0.05$), the null hypothesis was not rejected. Instead, the null hypothesis was accepted, concluding that there was not enough evidence to suggest an association between the knowledge of PID and the respondents' educational qualification ($X2(2) = 3.171$, $p = 0.205$).

Relationship between the Occurrence of PID and the Women's Age

It was revealed that, since the p-value was less than the chosen significance level ($\alpha = 0.05$), the null hypothesis was rejected. It was concluded that there was an association between the occurrence of PID and the age of women of reproductive age attending the Gynaecology clinic of Lagos State University Teaching Hospital, as a significant association was found between the occurrence of PID and the respondents' age ($X2(2)= 122.906$, $p < .001$)..

Conclusion

The findings of this study have concluded that there is no significant relationship between knowledge about PID and the women's educational qualification. However, there is a strong association between the occurrence of PID and the women's age, as their education motivates them to learn more and safeguard their health. Moreover, it was revealed that women of reproductive age attending the Gynecology clinic at Lagos State University Teaching Hospital, Ikeja, encounter various risk factors associated with PID including unsafe sexual intercourse, unsafe abortion, multiple sex partners, inadequate use of barrier contraceptives, sexually transmitted diseases, and frequent use of pain relief medication or herbal remedies.

Recommendations

Based on the findings revealed in this study, the following recommendations are suggested: The management of Lagos State University Teaching Hospital, Ikeja, should invest more time and resources in educating women of reproductive age attending the Gynaecology clinic on pelvic inflammatory disease, including its risk factors, preventive measures, and complications. Additionally, women of reproductive age attending the clinic should undergo routine testing for sexually transmitted diseases, regardless of whether they are exhibiting signs or symptoms, as pelvic inflammatory disease can sometimes be asymptomatic. Furthermore, pelvic inflammatory disease should be suspected in women of reproductive age presenting with symptoms such as painful sexual intercourse, heavy menstrual bleeding, intermenstrual bleeding, severe lower abdominal pain, and irregular menstruation.

Acknowledgement

The authors appreciate the management and staff of Lagos State University Teaching Hospital for assistance in this study.

Conflict of Interest

The authors declare that there is no conflict of interest.

References

Bourne, P. A. (2016). Urinary tract infections, pelvic inflammatory disease, hepatitis B, and diabetes mellitus among women of reproductive ages in a developing nation. Journal of Clinical and Diagnostic Research, 5(2), 331–339.

Greydanus, D. E., Cabral, M. D., & Patel, D. R. (2021). Pelvic inflammatory disease in the adolescent and young adult: An update. Disease-a-Month, 68(3), 101287.

Ingerslev, K., Hogdall, E., Schnack, T. H., Skovrider-Ruminski, W., Hogdall, C., & Blaakaer, J. (2017). The potential role of infectious agents and pelvic inflammatory disease in ovarian carcinogenesis. Infectious Agents and Cancer, 12, 25. Retrieved from https://pubmed.ncbi.nlm.nih.gov/28529540/

Naaz, F., Khan, N., & Mastan, A. (2016). Risk factors of pelvic inflammatory disease: A prospective study. International Journal of Herbal Medicine, 4(4), 129–133.

Okon, K., Ayilara, R., Bello, K., Uba, A., & Aniesona, T. (2008). Microbial spectrum of pelvic inflammatory diseases in Nguru, Nigeria. African Journal of Clinical and Experimental Microbiology, 9(3).

Olowe, O. A., Alabi, A., & Akindele, A. A. (2012). Prevalence and pattern of bacterial isolates in cases of pelvic inflammatory disease patients at a tertiary hospital in Osogbo, Nigeria. Environmental Research Journal, 6(4), 308–311.

Oseni, T. A., & Odewale, M. (2017). Socioeconomic status of parents and the occurrence of pelvic inflammatory disease among undergraduates attending Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria. Nigerian Postgraduate Medical Journal, 24(2), 114.

Usman, M. (2016). Prevalence of polymicrobial pelvic inflammatory infection among women attending three general hospitals in Niger State, Nigeria. A published thesis presented to the Department of Microbiology, Federal University of Technology Minna, Niger State, 33–41.

Wariso, K. T., Odigie, J., & Eyaru, S. (2012). Prevalence of Chlamydia trachomatis infection among female undergraduates of the University of Port Harcourt using Strand Displacement and Amplification (SDA) technique. The Nigerian Health Journal, 12(2), 35–55. Retrieved from http://www.tnhjph.com/index.php/tnhj/article/view/87.