Awareness of risk factors associated with tubal infertility among female youth corps members in Benin City, Nigeria

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Abstract

Infertility is the inability to achieve pregnancy within one year of regular unprotected coital exposures. It is a common gynecological problem in our environment. The cause of infertility could be of female origin, male origin, a combination of both, or idiopathic. It can be primary when there is no previous pregnancy, or secondary infertility when there is an inability to conceive after a previous conception. In secondary infertility, a tubal factor is the most typical cause globally. In a review of factors associated with tubal factor infertility in a tertiary hospital in southern Nigeria, the tubal aspect constituted 13.5%. It was due to previous post-abortion sepsis, puerperal sepsis, and Pelvic Inflammatory Disease (PID). Awareness of infertility risk factors is an essential first step to safeguard future fertility; however, several studies demonstrated poor knowledge of tubal infertility and its risk factors, especially among infertile couples and couples attending gynecology clinics. This study assesses the knowledge of female youth corps members in Benin City, Edo State, on tubal factor infertility, its risk factors, and management. A cross-sectional analytical study was conducted among female youth corps members in Benin City using a multi-stage sampling technique. A self-administered questionnaire was used for data collection. The data was entered and analyzed using Statistical Package for Social Sciences (SPSS) Version 25.0 (IBM SPSS V 25.0, Chicago, IL, USA) and presented using tables.

From this study, there is good knowledge of the burden of tubal infertility and treatment implications (50.4%). However, the knowledge of tubal infertility (34.3%) and its risk factors (27.0%) was poor. Age, marriage, and the medical profession are associated with sound knowledge of the burden of tubal infertility (p=0.02). However, only the medical profession is independently associated with good knowledge of tubal infertility (AOR=2.963, p=0.006, CI=1.370-6.411). There is generally poor knowledge of tubal infertility among females of reproductive age, who are at higher risk of pelvic inflammatory disease being the most typical risk factor for tubal infertility. This calls for more health awareness programs for the youth to help safeguard their future fertility.

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Introduction

Infertility is the inability of a couple to conceive despite regular unprotected sexual intercourse for a year.[1-3] It is considered a global issue, affecting many aspects of human life in both genders, with associated stigmas and marital disharmony among some couples.[4,5]

The problem of infertility continues to increase worldwide, as couples tend to postpone childbirth beyond 30 in pursuit of their education, careers, and financial stability while being involved in activities that could hamper fertility.[6] It's primary when there is no previous pregnancy, or secondary infertility where there is an inability to conceive after a previous conception.[2,4] In secondary infertility, the tubal factor is the most typical cause globally; others include ovulatory disorders, uterine or peritoneal disease, male factors, as well as unexplained causes.[2]

Globally, there is an upward trend in the incidence of infertility, affecting about 8-12% of couples.[4,6] In developed countries, the prevalence is 10-15% as against 20-46% in Sub-Saharan Africa.[4] Although variable and under-recognized in most developing countries, infertility remains higher in the infertility belt of Africa that cuts across West and Central Africa.[1] In a study in

northern Nigeria, the prevalence of infertility was 15.7%, with a predominance of secondary causes, amounting to 67.2%.[4] In a review of factors associated with tubal factor infertility in a tertiary hospital in southern Nigeria, tubal factor constituted 13.5%.[7]

Tubal disease is the most common cause of secondary infertility, accounting for 20% and 40% of primary and secondary infertility, respectively.[2,4] Tubal Factor Infertility (TFI) is among the most typical causes of infertility worldwide and accounts for 30% of infertility in females in the United States, with a high prevalence of 85% amongst infertile couples in Sub-Saharan Africa when compared to 33% cases worldwide.[6]

Most cases of TFI result from Pelvic Inflammatory Disease (PID) caused by previous or poorly treated ascending sexually transmitted infections to the upper genital tracts. About 15% of women with PID develop TFI, and the more episodes of PID, the more the risk of infertility, 34% and 54% in the second and third episodes, respectively. Other factors include tubal obstruction or occlusion, endo-salpingeal destruction, peri-adnexal adhesions, endometriosis, ectopic pregnancy, abdominopelvic surgery, induced surgical abortion, and smoking.[8-11]

Awareness of infertility risk factors constitutes a significant measure of protecting fertility. Emerging evidence revealed that the awareness of risk factors tends to vary with region, social status, and cultural and religious affiliations.[12-15] Thus, predisposing women, especially the young population, to infertility.[16-18]

Determinants of the level of knowledge of infertility risk factors include age, sex, marital status, level of education, previous fertility treatment, pregnancy history, and occupation. Ascertaining these various factors to the level of knowledge is subject to debate in the literature.[17-21]

However, adequate knowledge of the younger population on the various risks, especially PID, and preventive practices at multiple levels, like abstinence, faithfulness to a partner, avoiding post-abortion sepsis by use of effective contraception, use of barrier contraception, sex education, as well as the proper treatment of sexually transmitted infections will help to reduce the incidence of TFI.[22-36] TFI is currently on the increase. With increasing unprotected sexual intercourse and multiple partners, TFI will worsen over time.[35,36]

Despite the emphasis on its impact on infertility, there is still an overall poor knowledge of the risk factors of tubal infertility among the younger population in developing countries.[1,15,32,33] TFI treatment is mainly through assisted reproductive technology, which is expensive and out of reach of most couples.[33] Unfortunately, many single women of reproductive age still wallow in ignorance of this preventable problem, with the need for the enlightenment of the reproductive age group for better awareness.[6,22,23]

The aim is to assess the knowledge of female youth corps members in Benin City, Edo State, on tubal factor infertility, its risk factors, and management.

Materials and Methods

A cross-sectional analytical study was conducted among female youth corps members serving in Benin City during the study period. Female corps members were chosen in this study to enable uniformity of ideas and representation from all walks of life and religious and ethnic backgrounds, which can be seen among corps members. The sample size was determined using the Cochrane formula to get 184, rounded to 200, with a 10% non-response rate. Approval was sought from the State NYSC Co-coordinator through the Zonal Inspector (ZI) and Local Government Inspector (LGI). A multi-stage sampling technique with a simple random method was used for the Local Government Area (LGA) and respondents. In addition, a self-administered questionnaire-based study was conducted. The questionnaire elicited data on their sociodemographic characteristics, knowledge of TFI risk factors, and the burden of TFI and management. The data were entered and analyzed using Statistical Package for Social Sciences (SPSS) Version 25.0 (IBM SPSS V 25.0, Chicago, IL, USA). Categorical variables were compared using the Chi-square and Fischer's exact tests, while continuous variables were compared *using the Student's* t-test. The level of significance was set as $p<0.05$. Data were analyzed and presented using tables and charts. Ethical clearance was obtained from the University Benin Teaching Hospital's ethics committee.

Results

Two hundred questionnaires were distributed, and 196 were retrieved (98% response rate). Out of this entire response, 188 were correctly filled and therefore entered and analyzed. More than half of the respondents, 109 (58%), were aged between 20 and 25 years, with a mean age of 25.0±0.1 years. Most were Christians (95.7%) and of Igbo ethnicity (38.8%). About a third were single, 142 (75.5%), while the respondents of the non-medical group were 137 (72.9%) (Table 1). More than half, 110 (58.5%), of respondents knew that infertility treatment should be done by a gynecologist, and more respondents knew that infertility causes marital disharmony, 126 (67.0%), and a reason for divorce, 80 (42.6%). However, most did not know the answer to the rest of the questions on the burden of the disease and treatment (Table 2). The risk factors most correctly identified by respondents were PID, 138 (73.4%), and uterine fibroid, 108 (57.4%). The respondents did not know most of the other risk factors. About half of them, 92 (48.9%), wrongly consider toilet infection a risk factor (Table 3). The level of knowledge of risk factors for tubal infertility was 27.0%. Muslim respondents had a better knowledge of the risk fac-

Table 1. Sociodemographic data.

Variable	Frequency	Percentage (%)
Age		
20-25	109	58.0
26-30	76	40.4
31-35	3	1.6
Mean	25.0±0.1	
Religion		
Christianity	180	95.7
Islam	8	4.3
Others	0	0.0
Marital status		
Married	43	22.9
Single	142	75.5
Separated	3	1.6
Profession		
Medical	51	27.1
Non-medical	137	72.9
Ethnicity		
Igbo	73	38.8
Yoruba	33	17.6
Hausa	1	0.5
Others	81	43.1

tors of tubal infertility than Christians (p=0.004). No significant associations between other sociodemographic data and the level of knowledge of risk factors (Table 4). About half of the respondents had good knowledge of the burden of tubal infertility and its implications for treatment (50.4%) (Table 5). While factors associated with a good level of knowledge of tubal infertility(34.3%) and the medical profession is significantly associated with sound knowledge of tubal infertility (p=0.009), being married or separated reflected a better knowledge of tubal infertility than being single. However, this was not statistically significant (p=0.59). Increasing age and the Islamic religion also reflected better knowledge, but they were not statistically significant (Table 6). Medical professionals are more likely to have good knowledge of tubal infertility, considering that the respondents in the medical profession have about three times better knowledge than those in the non-medical profession. (AOR=2.963, p=0.006, CI=1.370-6.411) (Table 7). Being in the medical profession is more likely to enhance the knowledge of tubal infertility. (OR=2.512, p=0.010, CI=1.249-5.052) (Table 8).

Discussion

This study assessed the risk factors for tubal infertility among female youth corps members in Benin City, Nigeria. There is inadequate knowledge of infertility in the study population, with only 34.3%% of the respondents having good knowledge of tubal infertility. Further assessment of the knowledge of risk factors and the burden of tubal infertility and treatment carried out in this study found that knowledge was also generally poor, although better with the burden of the disease condition (50.4%) than its risk factors (27.0%). Factors that determine good knowledge were noted to be increasing age and being married. In addition, being in the medical profession is associated with sound knowledge of the burden of tubal infertility. However, only the medical profession was a statistically significant factor, following a multivariate logistic regression analysis (AOR=2.963, p=0.006, CI=1.370-6.411).

The results were corroborated by other studies showing a general lack of knowledge of the risk factors of tubal infertility.[12,18-22] Among the listed risk factors of tubal infertility demonstrated in previous studies, PID, uterine fibroid, and post-abortion sepsis were the only risks identified by the majority of the respondents (73.4%, 57.4%, and 52.1%, respectively).[9,12,30,31] About 50% of the respondents wrongly believe that "toilet infection" is a signifi-

Table 2. Knowledge of the burden of tubal infertility and treatment.

	Variable	Yes (%)	No (%)	Don't know (%)	Total (%)
1	Tubal disease is the most common cause of infertility in Nigeria	64 (34.0)	24 (12.8)	100 (53.2)	188 (100.0)
2	Ovulation induction with clomid (clomiphene citrate) or other drugs can treat tubal factor infertility	42 (22.3)	33 (17.6)	113 (60.1)	188 (100.0)
3	*In vitro* fertilization is the treatment of tubal infertility	72 (38.3)	33 (17.6)	83 (44.1)	188 (100.0)
4	One cycle of IVF in Nigeria costs an average of 1 million Naira	77 (41.0)	24 (12.8)	87 (46.3)	188 (100.0)
5	IVF has a high failure rate despite the high cost of treatment	72 (38.3)	40 (21.3)	75 (39.9)	188 (100.0)
6	Herbal medication can be used for tubal infertility treatment	42 (22.3)	59 (31.4)	87 (46.3)	188 (100.0)
7	Infertility treatment should be done by a gynecologist	110 (58.5)	17 (9.0)	61 (32.4)	188 (100.0)
8	Infertility causes marital disharmony among a couple	126 (67.0)	12 (6.4)	50 (26.6)	188 (100.0)
9	Infertility is a reason for divorce	80 (42.6)	54 (28.7)	54 (28.7)	188 (100.0)

IVF, *in vitro* fertilization.

Table 3. Knowledge of risk factors of tubal infertility.

	Variable	Yes (%)	No (%)	Don't know (%)	Total (%)
1	Pelvic Inflammatory Disease (PID)	138 (73.4)	9 (4.8)	41 (21.8)	188 (100.0)
2	Pelvic surgeries	52 (27.7)	25 (13.3)	111 (59.0)	188 (100.0)
3	Cigarette smoking	44 (23.4)	37 (19.7)	107 (56.9)	188 (100.0)
4	Uterine fibroids	108 (57.4)	8 (4.3)	72 (38.3)	188 (100.0)
5	Age above 35 years	34 (18.1)	54 (34.0)	90 (47.9)	188 (100.0)
6	Multiple sexual partners	38 (19.1)	57 (30.3)	95 (50.5)	188 (100.0)
7	Toilet infection	92 (48.9)	21 (11.2)	75 (39.9)	188 (100.0)
8	Chronic pelvic pain	52 (27.7)	29 (15.4)	107 (56.9)	188 (100.0)
9	Induced abortion/post-abortion sepsis	98 (52.1)	10 (5.3)	80 (42.6)	188 (100.0)
10	Infection following childbirth	66 (35.1)	23 (12.2)	99 (52.7)	188 (100.0)
11	Having sex once a month	42 (22.3)	59 (31.4)	87 (46.3)	188 (100.0)

cant risk factor, which is a misconception. However, despite this level of awareness, less than 50% of the respondents know that tubal disease is the most common cause of secondary infertility in Nigeria (34.0%), whereas 66% did not know. Furthermore, multiple sexual partners were the least accepted risk factor for tubal infertility (19.1%), which shows a wide gap in knowledge among the respondents, as they do not understand the natural history of PID as the aftermath of risky sexual behavior, being the most identified risk factor of tubal infertility.

In the assessment of the knowledge of the burden of tubal infertility and treatment, the respondents only show that infertility causes marital disharmony (67.0%). The majority did not know much about the burden of tubal infertility and its high cost of treatment through assisted reproductive technology. Some still believe that herbal medication (22.3%) and clomiphene citrate (22.3%) are used in their treatment. The respondents in the medical profession showed better knowledge of the burden of tubal infertility and treatment than the risk factors. Conversely, the previous studies among medical and non-medical students showed good knowledge among the medical students.[25,27,28]

Like in previous studies, age is positively associated with good knowledge of tubal infertility (p=0.02).[24] However, no age group has better knowledge than the other (AOR=3.327, p=0.362, CI=0.251-44.151), which is most likely due to the same level of

Table 4. Association of level of knowledge of risk factors of tubal infertility with sociodemographic data.

Variable	Level of knowledge among participants		Total	Test statistics	p
	Good knowledge (%)	Poor knowledge (%)			
Age					
20-25	23 (21.1)	86 (78.9)	109 (100.0)	0.867	0.648
26-30	17 (22.4)	59 (77.6)	76 (100.0)		
31-35	0 (0.0)	3 (100.0)	3 (100.0)		
Religion					
Christianity	35 (19.4)	145 (80.6)	180 (100.0)	8.477	0.004
Islam	5 (62.5)	3 (37.5)	8 (100.0)		
Marital status					
Married	9 (20.9)	34 (79.1)	43 (100.0)	3.755	0.153
Single	29 (20.4)	113 (79.6)	142 (100.0)		
Separated	2 (66.7)	1 (33.3)	3 (100.0)		
Profession					
Medical	14 (27.5)	37 (72.5)	51 (100.0)	1.593	0.207
Non-medical	26 (81.0)	111 (19.0)	137 (100.0)		
Ethnicity					
Igbo	12 (16.4)	61 (83.6)	73 (100.0)	6.329	0.097
Yoruba	10 (30.3)	23 (69.7)	33 (100.0)		
Hausa	1 (100.0)	0 (0.0)	1 (100.0)		
Others	17 (21.0)	64 (79.0)	81 (100.0)		

Table 5. Association of level of knowledge of risk factors of tubal infertility with sociodemographic data.

Variable	Level of knowledge among participants		Total	Test statistics	p
	Good knowledge (%)	Poor knowledge (%)			
Age					
20-25	28 (25.7)	81 (74.3)	109	7.824	0.02
26-30	33 (43.4)	43 (56.6)	76		
31-35	2 (66.7)	1 (33.3)	3		
Religion					
Christianity	59 (32.8)	121 (67.2)	180	1.020	0.313
Islam	4 (50.0)	4 (50.0)			
Marital status					
Married	21 (48.8)	22 (51.2)	43	12.815	0.002
Single	39 (27.5)	103 (72.5)	142		
Separated	3 (100.0)	0 (0.0)	3		
Profession					
Medical	26 (51.0)	25 (49.0)	51	9.586	0.002
Non-medical	37 (27.0)	100 (73.0)	137		
Ethnicity					
Igbo	20 (27.4)	53 (72.6)	73	3.096	0.377
Yoruba	14 (42.4)	19 (57.6)	33		
Hausa	0 (0.0)	1 (100.0)	1		
Others	29 (35.8)	52 (64.2)	81		

education and exposure of the respondents. Among the respondents with sound knowledge of risk factors of tubal infertility, Muslims have better knowledge than Christians (p=0.004); however, religion alone does not significantly affect good knowledge in this study (AOR=0.275, p=0.160, CI=0.046-1.666). Respondents who were married and separated for personal reasons had more knowledge than the single respondents. However, marital status does not affect a good level of knowledge of tubal infertility, risk factors, or implication of treatment (AOR=0.091, p=0.081, CI=0.006-1.344). These findings are contrary to previous studies where age and marital status were found to significantly affect knowledge of infertility among infertile couples who may have been exposed to or educated on infertility during clinic visits.[25,27] Medical and allied professions significantly influence good knowledge of tubal infertility, similar to previous studies.[25,27,28] (AOR=2.963, p=0.006, CI=1.370-6.411).

Table 6. Association of level of knowledge of tubal infertility with sociodemographic data.

Variable	Level of knowledge among participants		Total	Test statistics	p
	Good knowledge (%)	Poor knowledge (%)			
Age					
20-25	23 (21.1)	86 (78.9)	109 (100.0)	2.683	0.261
26-30	24 (31.6)	52 (68.4)	76 (100.0)		
31-35	1 (33.3)	2 (66.7)	3 (100.0)		
Religion					
Christianity	44 (24.4)	136 (75.6)	180 (100.0)	2.631	0.105
Islam	4 (50.0)	4 (50.0)	8 (100.0)		
Marital status					
Married	15 (34.9)	28 (65.1)	43 (100.0)	5.671	0.059
Single	31 (21.8)	111 (78.2)	142 (100.0)		
Separated	2 (66.7)	1 (33.3)	3 (100.0)		
Profession					
Medical	20 (39.2)	31 (60.8)	51 (100.0)	6.892	0.009
Non-medical	28 (20.4)	109 (79.6)	137 (100.0)		
Ethnicity					
Igbo	13 (17.8)	60 (82.2)	73 (100.0)	4.240	0.237
Yoruba	10 (30.3)	23 (69.7)	33 (100.0)		
Hausa	0 (0.0)	1 (100.0)	1 (100.0)		
Others	25 (30.9)	56 (69.1)	81 (100.0)		

Table 7. Association between demographic factors with knowledge (multivariate analysis).

Predictor	B (regression coefficient)	AOR	95% CI for AOR		p
			Lower	Upper	
Age					
20-25	0.831	2.295	0.161	32.817	0.540
26-30	1.202	3.327	0.251	44.151	0.362
31-35					
Religion					
Christianity	-1.290	0.275	0.046	1.666	0.160
Islam					
Marital status					
Married	-1.703	0.182	0.011	2.906	0.228
Single	-2.397	0.091	0.006	1.344	0.081
Separated					
Profession					
Medical	1.086	2.963	1.370	6.411	0.006
Non-medical					
Ethnicity					
Hausa	-21.221	0.000	0.000		1.000
Igbo	-0.590	0.554	0.244	1.261	0.159
Yoruba	0.064	1.066	0.388	2.929	0.902
Others					

CI, confidence interval; AOR, adjusted odd ratio.

Table 8. Association between demographic factors with knowledge (univariate analysis).

Predictor	B (regression coefficient)	AOR	95% CI for AOR		p
			Lower	Upper	
Age					
20-25	-0.626	0.535	0.046	6.162	0.616
26-30	-0.080	0.923	0.080	10.683	0.949
31-35					
Religion					
Christianity	-1.128	0.324	0.078	1.348	0.121
Islam					
Marital status					
Married	-1.317	0.268	0.022	3.202	0.298
Single	-1.969	0.140	0.012	1.591	0.113
Separated					
Profession					
Medical	0.921	2.512	1.249	5.052	0.010
Non-medical					
Ethnicity					
Hausa	-20.396	0.000	0.000		1.000
Igbo	-0.723	0.485	0.226	1.041	0.063
Yoruba	-0.026	0.974	0.404	2.347	0.953
Others					

CI, confidence interval; AOR, adjusted odd ratio.

Conclusions

Knowledge of tubal infertility is still poor among the younger population, despite being the most typical cause of female infertility. The respondents did not identify multiple sexual partners and induced abortion as significant risk factors for tubal infertility. In contrast, the medical profession showed a good knowledge of the burden of tubal infertility and treatment but poor knowledge of its risk factors. Health education and campaigning are needed to raise knowledge of these risk factors and protective measures for tubal infertility among young individuals.

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