

# Public knowledge on some factors that influence male and female infertility in Nigeria: social media users' perspective

## Abstract

**Objective:** To explore social media users' knowledge about certain issues peculiar to infertility in Nigeria

**Survey design:** Internet interview of non-representative Nigerians who use websites to source for information on infertility

**Setting:** Not applicable.

**Respondents:** Nigerians aged 20-65 years who wish to have biological or non-biological children of their own within the next 24 months or later in life.

**Main Outcome Measures(s):** Knowledge about menstrual period, infertility, infections and IVF.

**Results:** Ten questions were posted on the internet out of which 749 (2.42%) of 30,985 followers responded with an average score of 7 out of 10. Of the 749 respondents, 698 (93.2%) correctly answered 5 or more questions while 51 (6.8%) correctly answered less than 5 questions. Only 20 (2.7%) respondents correctly answered all the 10 questions while 1 (0.01%) respondent did not correctly answer any question, 7 (0.9%) respondents correctly answered only 2 questions, 12 (1.6%) correctly answered 3, 31 (4.1%) answered 4 correctly, 122 (16.3%) correctly answered 5 and 174 (23.2%), 196 (26.2%), 129 (17.2%) and 57 (7.6%) correctly answered 6, 7, 8 and 9 questions respectively. About 79% correctly responded that intra-uterine insemination can be used as an alternative to in-vitro fertilization for the treatment of infertility, 52% responded that a woman can still have her regular monthly menstruation during pregnancy while only 44% correctly identified tubal problems as a common cause of infertility as against 56% who wrongly mentioned endometriosis or Polycystic ovarian syndrome (PCOS).

**Conclusion:** Some gaps in the public knowledge and understanding of infertility, its causes and circumstances, were identified in this study, calling for educational campaign at State and Federal levels to promote awareness of factors that influence infertility.

**Keywords:** social media, fertility knowledge, virginity, infection, IVF

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## Introduction

Most people entertain the anticipation of establishing their own family at one point or another during their lifetime. However, certain factors, be it personal, environmental, genetic or hereditary, influence their inability to realize this goal. According to WHO, infertility and subfertility affect a significant proportion of humanity, defining infertility as a "disease of the reproductive system" which results in disability.<sup>1</sup> Among the general public, there seems to be wide gaps in the knowledge of human reproduction. What people believe about their fertility and the actual biology is very wide as demonstrated in a survey which polled the beliefs of 1,000 adults between the ages of 18-40 and demonstrated that 57% of respondents reported that they believed a woman's "biological clock" stopped ticking at age 44.<sup>2</sup> A study in Pakistan reported that only 25% participants correctly identified when infertility is pathological and that only 46% knew about the fertile period in women's cycle.<sup>3</sup> Another study states that only a third of respondents correctly identified the middle week between periods as the time in the menstrual cycle that a woman is most likely to conceive while 29% said the week just after her period, 18% responded that it is the week just before the next period, 7% almost any day except

during her period, 2% during her period and 12% said they did not know.<sup>4</sup> In the same study, the most common source of information on infertility was general internet search for 58% of the respondents. Abolfotouh et al.,<sup>5</sup> reported a generally poor level of knowledge (59%) and a neutral attitude (76%) toward infertility among Saudi couples. The study also identified that, among IVF patients and fertile outpatients, there was a significant disparity in knowledge regarding factors that may affect fertility, with a significantly higher level found among IVF patients (45.91% versus 41.68%;  $t=2.14$ ;  $P=0.035$ ). In a study in Benin City, Nigeria, majority of the respondents said that infertility is a female problem.<sup>6</sup> Though infertility is a serious global issue, somehow the public often pay less attention to it or actually assume it is not a big issue and not a life-threatening disease such as cardio-vascular accident in heart attack, metabolic disease such as diabetes or frightening illness such as neoplasm. The Bertarelli Foundation Scientific Board noted that infertility awareness was still low in a few countries in Europe, such as Belgium, Italy, France, Germany, Sweden and United Kingdom.<sup>7</sup> Still knowledge of, attitude to and health-seeking behavior for infertility are essential since these assist couples to gain more depth and understanding as well as decide when, where, how and who could provide appropriate and adequate

intervention for this difficult issue of infertility. Preventive measures, which include avoiding sexually transmitted infections, appropriate timing of sexual intercourse and avoiding delayed childbearing, can reduce the risk of future infertility. Many couples are still unaware of the existence of facilities for the management of infertility and moreover there are palpable gaps in their awareness of factors that influence infertility. There is still a wide opening in knowledge of infertility among Black sub-Saharan Africans. Many people now have direct access to the internet for various reasons. We seek to find out the knowledge of infertility from internet users in Nigeria to assess their knowledge on issues that affect or surround infertility. Therefore, the objective of this study was to identify local people's awareness and knowledge on infertility issues as very few studies on this topic have been conducted in Nigeria.

## Materials and methods

The survey took place between March and April 2018 in Nigeria. Social media users who visit the website of Nordica Fertility Center were first contacted if they would like to participate in an on-line survey of awareness of factors that influence infertility in Nigeria. This medium of communicating with the respondents was used because the internet is accessible to most Nigerians to source for information on health, including infertility. There was no other personal contact with the respondents, and they were free to answer fully, partially or not to answer at all.

### Participants

The survey was based on a self-administered questionnaire sent to 30,985 social media users (24,000 from www.abayomijayi.com.ng and 6,984 from Nordica Fertility Center website which is www.nordicalagos.org) to which 2,863 (9.2%) responded within the one-month period for the study. The participants were social media users in Nigeria between the ages of 20-68 years. They did not represent that part of the public that do not use the internet or do not have access to the internet. Of the 2,863 who completed the questionnaires 749 (26.2%) answered all the 10 questions. Questionnaires that were incompletely answered were not included in this analysis. These included where respondents answered only one question (431, 1.4%), only 2 questions (579, 1.9%), only 3 questions (499, 1.6%), only 4 questions (502, 1.6%), and only 5 questions (103, 0.3%).

### Selection

#### Selection mode

The participants were not pre-selected but were given 10 fertility-related questions to answer online via Dr. Abayomi Ajayi's website (www.abayomijayi.com.ng) and via Nordica Fertility Center website (www.nordicalagos.org).

#### Research instrument

The questionnaire consisted of True or False, Yes or No and respondents' opinions. The respondents had no time limit or any restriction to answer the questions. There were no inclusion/exclusion criteria therefore respondents were in their natural environment.

Ten probing, structured questions were asked including (i) When pregnant, can I still see my period? (ii) Is the semen that flows out after sex the reason for my infertility (iii) Is virginity a guarantee for being fertile? (iv) Which of the following is a major cause of

infertility in women in Nigeria - Tubal problems, Endometriosis, Polycystic Ovarian Syndrome? (v) Women trying to conceive should increase their intake of – Omega 3, Folic acid, Vitamin B? (vi) Men do not experience age related decline in fertility (vii) Which of these infections commonly cause infertility – HIV, Hepatitis, Chlamydia? (viii) IVF is a sure way to get pregnant (ix) Being in good health is a sign of being fertile and (x) Intra-uterine insemination can be used as an alternative to In-Vitro fertilization for treatment of infertility.

### Data management

Data were analyzed using STATA 13. The frequency of respondents that gave correct or incorrect answers to each question was recorded and percentages of these were deduced. Responses were presented in frequency of scores per question. Data was presented as Tables, graphs and bar charts.

### Results

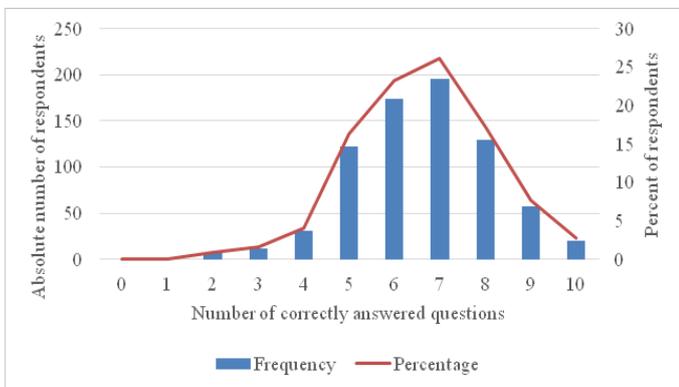
Of the 749 who answered all the 10 questions, only 20 (2.7%) correctly answered all the questions. Seven (0.9%) answered two questions correctly, 12 (1.6%), 31 (4.1%) and 122 (16.3%) correctly answered 3, 4 and 5 questions while 174 (23.2%), 196 (26.2%), 129 (17.2%) and 57 (7.6%) correctly answered 6, 7, 8 and 9 questions (Figure 1). Approximately the same proportion of respondents said yes (379, 50.6%) or no (370, 49.4%) to whether a woman can still see her menstrual period when pregnant while almost all (728, 97.2%) disagreed that virginity is a guarantee for being fertile. Omega 3 is a poly-unsaturated fatty acid fish oil soft gel that is claimed to improve concentration and brain development commonly available in Nigeria. However, most respondents (588, 78.5%) preferred Folic acid as one of the important medications the intake of which should be increased by women trying to conceive. When asked whether IVF is a sure way to get pregnant, 458 (61.1%) disagreed while 291 (38.9%) agreed it to be correct. The final true or false question proposed that being in good health is a sign of being fertile, to which 579 (77.3%) disagreed but 170 (22.7%) answered in the affirmative (Table 1).

**Table 1** Frequency distribution of responses to certain questions pertaining to menstruation, pregnancy and fertility

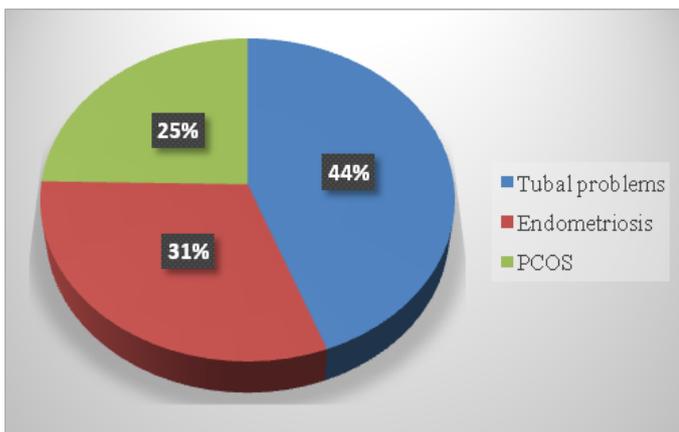
Question	Response	Freq.	%
When pregnant, can I still see my period?	Yes	379	50.6
	No	370	49.4
Is virginity a guarantee for being fertile?	Yes	21	2.8
	No	728	97.2
Women trying to conceive should increase their intake of which of these?	Omega 3	90	12
	Folic Acid	588	78.5
	Vitamin B	71	9.5
IVF is a sure way to get pregnant	True	291	38.9
	False	458	61.1
Being in good health is a sign of being fertile	True	170	22.7
	False	579	77.3

When given 3 options of tubal problems, endometriosis and polycystic disease of the ovary (PCOS), 332 (44.3%) of respondents

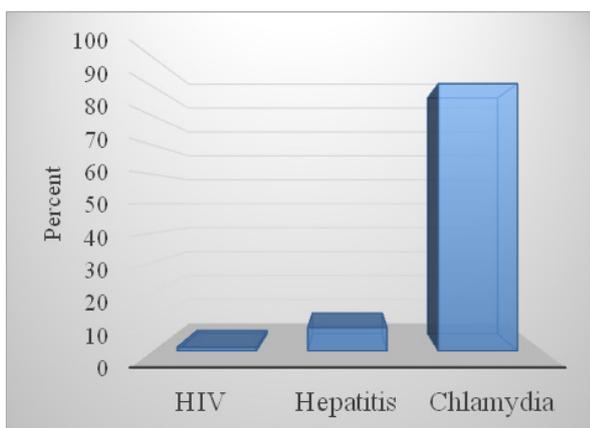
decided that among these 3, tubal problems are the major cause of infertility among Nigerian women while 232 (31.0%) said that it is endometriosis and 185 (24.7%) said it is PCOS (Figure 2). A large proportion of the respondents (679, 90.7%) believed that chlamydia infection commonly causes infertility but not hepatitis (60, 8.0%) or Human Immuno-deficient Virus (HIV) (10, 1.3%) (Figure 3).



**Figure 1** Frequency distribution and percentage of respondents who correctly answered various questions.



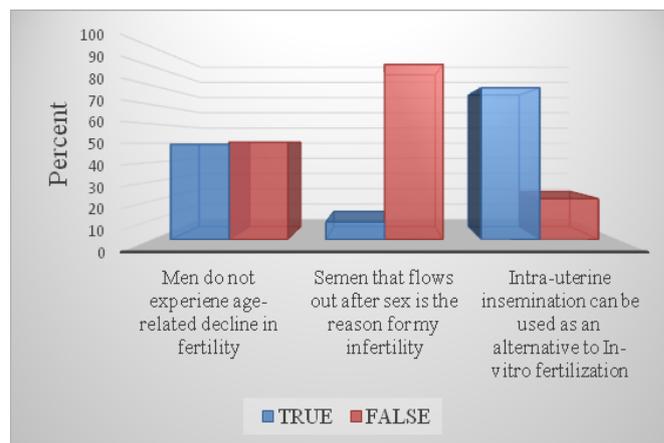
**Figure 2** Response to the major cause of infertility in female reproductive organ among Nigerians?



**Figure 3** Frequency distribution of response to the infection that commonly causes infertility among Nigerian women.

There were two other questions that relate to male fertility and one that relate to In-vitro fertilization (IVF) which the respondents

answered true or false to. The first was that men do not experience age-related decline in fertility to which almost the same proportion answered true (370, 49.4%) or false (379, 50.6%). The second was that semen that flow out after sexual intercourse is the reason for a woman's infertility to which 68 (9.1%) agreed as true but 681 (90.9%) disagreed as false. The last question in this series was that intra-uterine insemination can be used as an alternative to in-vitro fertilization to which 590 (78.8%) agreed as true and 159 (21.2%) disagreed (Figure 4).



**Figure 4** Distribution of frequencies of response to some other questions.

## Discussion

Our study was designed to gather information about knowledge of internet users about infertility among Black Africa Nigerians. Though awareness about infertility may be common, knowledge of circumstances surrounding infertility is relatively inadequate in many parts of the world. Ali et al.,<sup>3</sup> in a global survey of approximately 17,500 women of child-producing age in ten countries observed that knowledge regarding fertility and biology of reproduction was still poor. There are certain key findings in our study one of which is that the number of respondents who correctly answered the questions increased gradually and then also dropped gradually, following a Gaussian curve. This may suggest that on the average, there is a moderately high knowledge of infertility among internet users in Nigeria, be they men or women, young or old. However, that only 2.7% of the respondents correctly answered all the ten questions attest to the fact that there is still a lot of gap in the knowledge of infertility. Ideally, when a woman is pregnant, menstruation stops but slightly more than half of the respondents said that they still see their period when pregnant. Vaginal bleeding or spotting during the first trimester of pregnancy is relatively common occurring in about 20% of pregnancies.<sup>8</sup> A woman's hormone levels during pregnancy often change to prevent menstruation. Further, it is impossible for the womb to shed its entire uterine lining (menstruation) while it is sustaining a pregnancy, though some form of decidual bleeding might occur in which a small part of the uterine lining might shed for the first few months of early pregnancy at about the same time the woman would otherwise have had her normal period. Also spotting, a light vaginal bleeding during pregnancy, is often a symptom of impending miscarriage. Sub-chorionic hemorrhage may be a major risk factor for miscarriage.<sup>9</sup> Other possible causes of bleeding, especially heavier like a period, during pregnancy are ectopic pregnancy, infection, miscarriage, molar pregnancy, and gestational trophoblast disease

(GTD) which is a rare group of tumors that arise from the cells that normally develop into the placenta. Bleeding during pregnancy may be regarded as a medical emergency requiring an immediate visit to the health care professional, especially when accompanied by back pain, severe abdominal pain or cramps, dizziness, faintness or loss of consciousness, fatigue, fever or shoulder pain.<sup>10</sup>

There was a relatively high knowledge among internet users in Nigeria that tubal problems are causes of infertility. Audu et al.,<sup>11</sup> identified tubal factor as the cause of female infertility in 67.2% of their study subjects in northern Nigeria. Gerais & Rushwan<sup>12</sup> noted that about 66% of African women experienced tubal factors compared to about 33% worldwide, that approximately 9% of women reported a history of sexually transmitted disease (STD), and 8% reported abortion complications and 46% of men in sub-Saharan Africa reported a history of STDs. Further, they contend that almost 24% of women with primary infertility and 40% of women with secondary infertility had no previous history of pelvic inflammatory disease or STDs and had tubal disease. Tubal factor infertility accounts for a large portion of female factor infertility and the most prevalent cause of tubal factor infertility is pelvic inflammatory disease and acute salpingitis.<sup>13</sup> Miller et al.,<sup>14</sup> emphasized that tubal factor infertility due to occlusion and peritoneal pathology causing adhesion is the most common cause of female infertility and diagnosed in about 30% to 35% of younger and older infertile women. Fewer respondents had a knowledge of endometriosis as a cause of infertility. That endometriosis is found in about 6-10% of women population may be responsible for the low knowledge of this disease. Its association with dysmenorrhea, dyspareunia, utero-tubal factors menorrhagia and primary infertility had been reported in our earlier paper.<sup>15</sup> Endometriosis is often associated with infertility and infertility is likewise associated with endometriosis. The pain of endometriosis is initially waved away as the usual menstrual pain by most women. Polycystic ovarian syndrome (PCOS) is less known as cause of infertility and this may be responsible for lack of knowledge about it among the Nigerian internet users. Women with PCOS are known to have normal uterus and fallopian tubes but their ovaries contain numerous small cysts each of about 8 mm in diameter, do not require surgery for removal and are not associated with an increased risk of cancer (<https://tulsafertilitycenter.com/female-infertility/pcos.php>). This disorder of the endocrine and reproductive systems has a prevalence of 5%<sup>16</sup> to 13%<sup>17</sup> in women of reproductive age and is a primary cause of hyperandrogenism and oligo-anovulation at the reproductive age and is often associated with infertility<sup>18</sup> and clinical and metabolic disorders.<sup>19</sup> Respondents were knowledgeable that Chlamydia infection commonly causes infertility in women. Carey & Beagley<sup>20</sup> reported a steadily increasing prevalence of Chlamydia trachomatis with approximately 50-70% of infections being asymptomatic, which, undetected, can lead to severe reproductive sequelae including pelvic inflammatory disease and tubal infertility. Most respondents (91%) were correct to debunk the notion that semen flowing out after sex is responsible for infertility. According to a source, semen effluvium after sexual intercourse is normal in every single female and does not in any way have any connection to fertility or conception.<sup>21</sup> Millions of sperm cells are in ejaculate and only one is needed to fertilize an ovum. Most of our respondents were also correct to agree that intra-uterine insemination (IUI) can be an option for IVF in infertile couples who qualify for it. Bouet et al.,<sup>22</sup> reported that in women undergoing controlled ovarian hyperstimulation (COH) for in vitro fertilization (IVF), a poor ovarian response (three of fewer mature follicles), can lead to cancellation of the cycle. However, in women with at least one patent tube and normal semen parameters, conversion to intrauterine insemination

(IUI) is considered an option, offering reasonable pregnancy rates at a lower cost and without the complications associated with oocyte retrieval. This was corroborated by the study of Quinquin et al.,<sup>23</sup> which concluded that it is a therapeutic strategy to pursue IVF for women demonstrating two follicles and to convert to IUI for cycles with only one follicle if the sperm and tubal parameters are favorable. Finally, almost equal proportion of respondents agreed and disagreed that men do not experience age-related decline in their fertility. This, as expressed by respondents, is a controversial issue as some studies<sup>24-28</sup> are favorably disposed to age-related decline while others are of a divergent view.<sup>29,30</sup> Still, some authors made notes of confounders such as duration of abstinence, average ejaculation frequency, time from sample collection to sample processing and seasonal weather changes in relation to semen parameters.<sup>31,32</sup> Our previous studies however reflect worsening semen parameters among Nigerians<sup>33</sup> and that paternal age may influence some semen parameters such as volume and liquefaction time.<sup>34</sup>

## Conclusion

This study concludes that there is a relatively high public knowledge on some factors that influence male and female infertility in Nigeria. This conclusion was arrived at after internet interview of Nigerians who visit Dr. Abayomi Ajayi's website ([www.abayomiAjayi.com.ng](http://www.abayomiAjayi.com.ng)) and via Nordica Fertility Center website ([www.nordicalagos.org](http://www.nordicalagos.org)). A simple 10-query questionnaire posted on the internet elicited varying responses according to the knowledge of the respondents. In all 698 (93.2%) of the 749 respondents correctly answered 5 or more questions, indicating a moderately high public knowledge on some factors that influence male and female infertility in Nigeria. Chlamydia infection was singled out by most respondents as the infection that most commonly leads to infertility among Nigerian women. Public health programs should be implemented to prevent infection-related infertility<sup>12</sup> and further improve public knowledge of factors influencing male and female infertility.

## Acknowledgments

None.

## Conflicts of interests

The authors declare that they have no competing interests.

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