



Knowledge of Infertility Among Infertile Women in Bauchi, Northern Nigeria

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Abstract

Objectives: To evaluate the knowledge, perception and treatment seeking behaviour of infertile women in Bauchi, northern Nigeria.

Materials and Methods: Four hundred and six infertile women were surveyed in two hospitals using a structured questionnaire between July 2013 and June 2014.

Results: The ages of the respondents ranged from 19 to 42 years with a mean age of 30.5 years (SD: ± 5 years). Many (81%) of the respondents had poor knowledge of risk factors for infertility and over 80% believed in supernatural causes. The women who had secondary level of education or higher (4.78, CI: 2.35-9.71, $P < 0.001$) and those who were employed (3.08, CI: 1.44-6.58, $P = 0.04$) had significantly better knowledge compared to those who had lower level of education and were unemployed. Almost three-quarters ($n = 299$, 73.6%) believed that women bear the blame for infertility and 40.4% see it as a reason for the man to take another wife. Half of the women felt the woman alone should seek for treatment and only 28% reported hospital as their site of initial treatment. Most ($n = 370$, 91%) felt infertility should be given priority in public hospitals and 308 (76%) believed the government should pay for infertility services as done for other reproductive health (RH) services.

Conclusion: There is low level of knowledge of infertility among infertile women in Bauchi and women bear the blame for infertility. There is need for initiatives to improve RH education in Bauchi.

Keywords: Infertility, Knowledge, Nigeria, Women

Introduction

Infertility has always existed but is now recognised as a global reproductive health (RH) problem and as an important component of RH (1). It is a world-wide health concern and affects between 8% and 15% of couples (2). In sub-Saharan Africa, the burden of infertility is higher and is as high as 30% in some countries (3). The desire to bear children is almost a universal one in Nigeria and most parts of sub-Saharan Africa. While infertility is not a life-threatening condition, its negative social and mental impact on individuals has been documented. It is mainly women who suffer adverse effects including stigmatisation, domestic violence (4) and feelings of low self-esteem (5,6). Previous studies have shown a low level of knowledge of causes of infertility in many countries in Africa despite the high prevalence of the condition (5,7).

There is no data on knowledge of this important reproductive morbidity in Bauchi, Northern Nigeria. Therefore, the aim of this study is to fill the data gap by assessing the knowledge, attitude of infertility and treatment seeking behaviour among infertile women. The information will be useful in formulating interventions to improve education on reproduction.

Materials and Methods

The study was a cross-sectional survey of 406 infertile

women attending the gynaecological clinics of ATBU Teaching Hospital and Federal Medical Centre, Azare, in Bauchi state, northern Nigeria.

We designed a questionnaire with questions covering socio-demographic characteristics, knowledge and perceptions of the causes and treatments of infertility and treatment seeking behaviour in relation to the presenting problem of infertility. The questionnaire was interviewer-administered and was based on one used in a study to examine infertility in Pakistan (8).

The questionnaire listed the common causes and risk factors for infertility (18 in number for both women and men). Given that belief in supernatural causes is common in these northern Nigerian communities, we also included it in the list of possible responses. We designed the questionnaire such that the participant was asked to firstly list the causes she knew, before the interviewer listed a number of causes to see if they recognised the factor as a cause of infertility or not. We thus graded the responses as "spontaneously mentioned," "recognised after the interviewer said it" or "not recognised at all as a cause of infertility." There were 20 items and an appropriate response for each item was coded 1 when it was spontaneous, 2 when it was recognised after prompting and 3 if not recognised. We added the codes for the answers to all the questions for each participant. Those with a sum between 20 and 40 were

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deemed to have good knowledge, while those with sums between 41 and 60 defined as having poor knowledge. The questionnaire also explored society's responses to infertility and asked about acceptable or common responses to infertility such as divorce, polygamy and the attribution of blame. The study also asked participants' knowledge of available treatment options and what services existed for infertility management.

Data was analysed using SPSS (version 20, IBM, USA). Descriptive statistics were employed where appropriate to illustrate the characteristics of the studied population. Chi-square test was used to test association of the variables with knowledge. Those variables that were significant were then entered into multiple regression model to determine the strength of association. A significance level of 0.05 was used.

Results

We enrolled 406 infertile women out of the total 427 (95%) that were approached to participate. The ages of the respondents ranged from 19 to 42 years with a mean age of 30.5 years (SD: ± 5 years). Over 80% of the respondents were aged 35 years and below. The age distribution and other characteristics of the participants are shown in Table 1.

Just under two-thirds of participants 250 (61.6%) spontaneously mentioned sexually transmitted infections (STI) when asked about causes of infertility, but only 146 (36%) spontaneously mentioned irregular menstruation and even fewer (30%) recognised it as a cause of infertility after it was mentioned. A substantial number did not recognise smoking ($n = 324$, 79.8%), alcohol consumption ($n = 328$, 80.8%) and diabetes mellitus ($n = 331$, 81.5%) as risk factors for infertility. Over a third of women however spontaneously mentioned evil spirits ($n = 143$, 35.2%) and witchcraft ($n = 153$, 37.2%) as causes of infertility. A similar pattern of responses was observed when the women were asked about causes and risk factors for infertility in men as shown in Table 2.

A total of 299 women (73.6%) said the woman is blamed for infertility in the community, 290 (71.4%) women felt it should not be a reason for divorce, while 146 (40.4%) said it was a reason to marry another wife (Table 3).

A computation of the scores for the appropriate responses to causes/risk factors revealed that 94 (23.4%) of the women had good knowledge, while 312 (76.8%) of them had poor knowledge. We undertook a logistic regression analysis to determine the demographic factors predictive of having good knowledge. The model was statistically significant ($\chi^2 = 52.50$, $df = 11$, $P < 0.001$). The model explained 18.3% of the variation in knowledge and predicted 82.5% of cases. The women who had a secondary level of education or higher (4.78, CI: 2.35-9.71, $P < 0.001$) and those who were employed (3.08, CI: 1.44-6.58, $P = 0.004$) were more likely to have good knowledge of the factors for infertility in the studied population compared to those with lower level of education and those who were unemployed (Table 4).

Table 1. Socio-Demographic Characteristics of 406 Infertile Women

| Variable | Number (%) |
|------------------------------|------------|
| Age (years) | |
| <20 | 13(3.2) |
| 21-25 | 59 (14.5) |
| 26-30 | 153 (37.7) |
| 31-35 | 116 (28.6) |
| 36-40 | 61 (15.0) |
| 41-45 | 4 (1.0) |
| Occupation | |
| Unemployed (Housewives) | 251 (61.8) |
| Students | 76 (18.7) |
| Skilled workers | 48 (11.8) |
| Unskilled workers | 31 (7.7) |
| Ethnicity | |
| Hausa | 169 (41.6) |
| Fulani | 67 (16.5) |
| Jarawa | 55 (13.5) |
| Yoruba | 39 (9.6) |
| Igbo | 37 (9.1) |
| Others | 39 (9.6) |
| Religion | |
| Christianity | 112 (27.6) |
| Islam | 294 (72.4) |
| Education | |
| None | 15 (3.7) |
| Arabic/madrasah | 94 (23.2) |
| Primary | 87 (21.4) |
| Secondary | 129 (31.8) |
| Tertiary | 81 (20.0) |
| Place of residence | |
| Rural | 102 (25.1) |
| Urban | 304 (74.9) |
| Type of marital union | |
| Monogamy | 263 (64.8) |
| Polygamy | 143 (35.2) |
| Number of marriages | |
| Once | 333(82.0) |
| Twice | 68 (16.8) |
| Thrice | 5 (1.2) |
| Parity | |
| 0 | 193 (47.5) |
| 1 | 121 (29.8) |
| 2 | 64 (15.8) |
| 3 | 17 (4.2) |
| >4 | 11 (2.7) |

The majority of the women ($n = 395$, 97%) viewed infertility as a disease and half of the sample ($n = 204$, 50.2%) felt that the woman alone should seek treatment (Table 5). Only 115 (28%) of participants reported the hospital as the first place of treatment. Awareness of treatment options like drugs and surgery was high (97% and 66.3%, respectively) among the respondents. Two hundred and forty-eight women (61%) reported spending more than 50,000 Naira (US\$250) and 370 (91%) felt infertility should be given priority in public hospitals. The majority 308 (76%) wanted the government to pay for infertility services like other RH services.

Table 2. Responses to Causes/Risk Factors of Infertility of 406 Women

| Cause/risk factor | Spontaneously mentioned, n(%) | Recognised, n(%) | Not recognised, n(%) |
|---|-------------------------------|------------------|----------------------|
| STIs | 250 (61.6) | 111(27.3) | 45 (11.1) |
| Abnormal menstruation | 146 (36.0) | 124 (30.5) | 136 (33.5) |
| Inadequate sexual activity | 94 (23.2) | 89 (21.9) | 223 (54.9) |
| Smoking | 19 (4.7) | 63 (15.5) | 324 (79.8) |
| Alcohol consumption | 18 (4.4) | 60(14.8) | 328 (80.8) |
| HIV/AIDS | 49 (12.1) | 64(15.8) | 293 (72.2) |
| Diabetes mellitus | 22(5.4) | 53 (13.1) | 331 (81.5) |
| Drugs | 55(13.5) | 53 (13.1) | 298 (73.4) |
| "How a person was created" ^a | 98 (24.1) | 79 (19.5) | 229 (56.4) |
| Evil spirits | 143 (35.2) | 196 (48.3) | 67 (16.5) |
| Witchcraft/curse | 153 (37.7) | 198 (48.8) | 55 (13.5) |
| Cause/risk factor in men | | | |
| Smoking | 19 (4.7) | 57 (14.0) | 330 (81.3) |
| Alcohol consumption | 13 (3.2) | 57 (14.0) | 336 (82.8) |
| Erectile dysfunction | 174 (42.9) | 128 (31.5) | 104 (25.6) |
| Diabetes mellitus | 30 (7.4) | 49 (12.1) | 327 (80.5) |
| HIV/AIDS | 59 (14.5) | 56 (13.8) | 291 (71.7) |
| Pelvic surgery | 67 (16.5) | 55 (13.5) | 284 (70.0) |
| "How a person was created" ^a | 108 (26.6) | 98 (24.1) | 200 (49.3) |
| Evil spirits | 162 (39.9) | 190 (46.8) | 54 (13.3) |
| Witchcraft/curse | 155 (38.2) | 189 (46.6) | 62 (15.3) |

Abbreviation: STI, sexually transmissible infections.

^a The local way of referring to genetic make-up of a person.

Table 3. Opinions on Social Consequences of Infertility of 406 Infertile Women

| Social Consequence | Number (%) |
|--|------------|
| Infertility as a reason for divorce | |
| Yes | 52 (12.8) |
| No | 290 (71.4) |
| I do not know | 64 (15.8) |
| Infertility as a reason for another marriage | |
| Yes | 164 (40.4) |
| No | 193 (47.5) |
| I do not know | 49 (12.1) |
| Who is the person blamed for infertility | |
| Wife | 299 (73.6) |
| Husband | 1 (0.2) |
| Both | 83 (20.4) |
| No one | 10 (2.5) |
| I do not know | 13 (3.2) |

Discussion

This study investigated the knowledge of causes and treatment seeking behaviour of infertility among infertile women attending two hospitals in Bauchi, northern Nigeria.

The results of this survey showed a low level of knowledge of infertility in the studied population of reproductive age women, with only 19.2% of the respondents having good knowledge of the causes of and risk factors for infertility. More than a third (33.5%) of the respondents did not recognise irregular menstruation as a cause of infertility. Knowledge of STI as a cause, which was spontaneously mentioned by 61.6%, was the most recognised. Although STIs are significant contributors to tubal damage and infertility in developing countries, women's knowledge in other African studies has varied. One study of wom-

en attending the gynaecological clinic in Lagos showed that more than half (57.5%) were aware of infertility as a complication of STIs. However, another study among 2000 men and women in rural Ghana revealed less than 2% of participants referred to STIs as a cause of infertility (9,10). The finding from a qualitative study in South Africa similarly reported most infertile women and men had an inadequate understanding of the possible causes of infertility (5,11). The differences in the findings between the studies could reflect the differing levels of education and development of the countries. In our study, the participants had low levels of education that most likely that was a key contributing factor to the very low levels of knowledge amongst the participants.

Over 80% of the respondents did not recognise other factors that can affect fertility such as smoking, alcohol consumption, HIV and diabetes mellitus. These findings are consistent with previous studies in both developed and developing countries. In a survey of Canadian childless women, only 50% were able to answer correctly 6 out of 16 (37.5%) knowledge items on fertility and reproduction (12). In an Australian study of men and women who were planning to have a child, just over 40% were unaware that smoking and obesity can reduce fertility in women and two-thirds were unaware that these factors can affect male fertility (13). Therefore, in both high and low resource settings there exists a need to raise awareness about the lifestyle and health-related factors that can assist with prevention and management of infertility (14,15).

Efficient delivery of care depends on a good understanding of the causes, experiences and consequences of infertility and of the cultural context in which the experiences occur. A significant finding of our study is that over

Table 4. Association Between Socio-Demographic Characteristics and Good Level of Knowledge

| Variable | Univariate | P Value | Multivariate Odds Ratio (95%CI) | P Value |
|--------------------------------------|---------------|---------|---------------------------------|---------|
| Age | | | | |
| 19-24 ^a | 15/44 (34.1) | 0.08 | 1 | |
| 25-30 | 46/179 (25.7) | | 0.27 (0.09-1.84) | 0.23 |
| 31-35 | 23/118 (19.5) | | 0.46 (0.19-1.13) | 0.09 |
| ≥36 | 10/65 (15.4) | | 0.86 (0.35-2.09) | 0.73 |
| Education | | | | |
| At least primary ^a | 21/196 (10.7) | <0.001 | 1 | |
| At least secondary | 73/210 (34.8) | | 4.78 (2.35-9.71) ^b | <0.001 |
| Occupation | | | | |
| Unemployed (housewives) ^a | 45/251 (17.9) | 0.001 | 1 | |
| Students | 19/76 (25.0) | | 1.65 (0.83-3.29) | |
| Employed | 30/79 (38.0) | | 3.08 (1.44-6.58) ^b | 0.004 |
| Place of residence | | | | |
| Rural ^a | 13/102 (12.7) | 0.004 | 1 | |
| Urban | 81/304 (26.6) | | 1.14 (0.54-2.39) | 0.73 |
| Marital Union | | | | |
| Monogamous ^a | 71/263 (27.0) | 0.013 | 1 | |
| Polygamous | 23/143 (16.1) | | 1.01 (0.53-1.92) | 0.97 |
| Parity | | | | |
| Nulliparous ^a | 57/193 (29.5) | 0.004 | 1 | |
| Para 1 and above | 37/213 (17.4) | | 0.81 (0.33-1.95) | 0.63 |
| Duration of infertility | | | | |
| 1-4 years ^a | 63/236 (26.7) | 0.05 | 1 | |
| 5 years and above | 31/170 (18.2) | | 1.05 (0.53-2.06) | 0.61 |
| Type of infertility | | | | |
| Primary ^a | 47/165 (30.3) | 0.01 | 1 | |
| Secondary | 47/251 (18.7) | | 0.89 (0.37-2.11) | 0.79 |

^aReference category; ^bStatistically significant.

Table 5. Attitude and Behaviour Regarding Infertility of 406 Infertile Women

| Attitude/Behaviour | Number (%) |
|---|------------|
| Do you see infertility as a disease? | |
| Yes | 395 (97.3) |
| No | 2 (0.5) |
| I do not know | 9 (2.2) |
| Do you believe it is treatable? | |
| Yes | 382 (94.1) |
| No | 1 (0.2) |
| I do not know | 23 (5.7) |
| Who is to seek for treatment? | |
| Wife | 204 (50.2) |
| Husband | 5 (1.2) |
| Couple | 197 (48.5) |
| Where do you go first for treatment? | |
| Traditional healer | 171 (42.1) |
| Hospital | 115 (28.3) |
| Spiritual healer | 120 (29.6) |

a third of women believed in the role of supernatural beliefs/myths in the causation of infertility. More than 35.2% of the respondents said evil spirits and 37.7% said witchcraft contributed to infertility. These findings differ from those from a survey of 104 infertile and 277 fertile couples in a tertiary hospital in Saudi Arabia where 58.8% and 67.5% of mentioned supernatural causes and magic as causes of infertility, respectively (16). Nevertheless, it is comparable to findings of the study of 447 women and

men in Pakistani hospital clinics where 30% reported supernatural causes and 38% mentioned magic and from Uganda where just over half of women (51.3%) believed evil spirits caused infertility (8,17). These similar findings across different populations may be due to shared cultural or religious beliefs as in traditional human societies; supernatural forces and powers are considered to cause many disease conditions. The findings have implication for health care, as the people are likely to seek a solution to the perceived supernatural causes before presenting to the orthodox health system and this delay can affect their subsequent management.

Infertility is a social problem in addition to being a medical condition. In many communities across the world, cultural and religious norms expect a couple to have children as the fruits of marriage (6,18) and failure to conceive can exert enormous strain on a couple leading to divorce and abandonment (19). In our study, 71.4% of women did not view infertility as a reason for divorce, but 12.8% of the women did. This is lower compared to a study of 104 infertile couples in Saudi Arabia amongst whom 38.5% believed infertility was a reason for divorce (16). In societies, such as in northern Nigeria, where there is significant gender inequity, divorce (primarily the prerogative of the man) usually leads to loss of status and value of the women (20). Women have to move back to their parents' house, may lose the rights and privileges accorded to married women. Although infertility is not a valid reason for divorce under Islamic law (*Shari'ah*), it does occur in these

societies for this reason.

Another consequence of infertility that is not prevalent in western society is polygamy. The practice is common in sub-Saharan Africa with recognition in cultural norms and Islamic laws. It was, therefore, not surprising that 40.4% of the respondents agreed that infertility was a valid reason to take another wife. The result is less than the 62.5% reported in the Saudi Arabian study and less than the 57% reported in a study in Pakistan (8,16). This difference may reflect the fact that our population was of mixed religious background including 27% Christians in contrast to the Pakistani and Saudi studied samples that were all Muslims. Interestingly an in-depth interview study of 25 infertile women in Jordan found that women preferred the choice of polygamy to avoid the social stigma of divorce with the attendant consequences (21).

Studies show that women bear more of the blame for infertility compared to men (22-24). Our study confirmed this finding with 73.6% of the respondents reporting that women bear the blame for infertility and only 20.4% stating that men and women share the responsibility for the inability to conceive. Indeed men, usually report having had children with other women and rarely present themselves for investigations in sub-Saharan Africa (25). The social reaction towards a woman as the sole cause of a couples' infertility is distressing and may affect her self-esteem (26,27). Men and women both experience the effects of infertility but compared to women; men uncommonly express concern about its impact on the stability of their marriage (11). The experience of abuse, divorce and polygamy, which carry more implication for women, may alter the perspective of how men and women view infertility.

Women's similar experiences of the consequences of infertility across many developing countries may indicate that the issues are not unique to a particular culture or religion. This may reflect the low status of women in these countries where the primary form of expression of femininity is via successful reproduction (28,29). Formal education keeps the girl-child in school for most of the adolescent period and delays the age of marriage and assumption of responsibilities of childbearing. The adolescent period is the time when interventions can have a considerable effect on subsequent life outcomes. Therefore, education initiatives and empowerment are strategies that can improve the status of women in such societies and lessen the social impact of infertility (30,31).

The majority (97.3%) of the respondents in our study regard infertility as a disease that is treatable. In a similar study in Pakistan, only 55% thought of infertility as a disease condition (8). We believe this is a favourable attitude because, with its acceptance as a disease state it will be easier to educate people on how and where to seek care. The desire to bear children is one of the strong human cravings and studies reveal many infertile clients are willing to do anything to resolve the problem (5,24). In our study, half of the women felt that the woman should seek treatment alone while the other half felt the couple should

seek treatment. The finding was different from studies in South Africa, Saudi Africa and Pakistan (5,16,32) where the majority believed the couple should present for investigation and management together. However, our findings are similar to those in studies undertaken in Gambia and Ghana (10,33) which found that women alone were the ones seeking care whether in orthodox or traditional medicine outlets.

The majority of our respondents (71.7%) had sought care from traditional and spiritual healers for infertility before presenting to the hospitals. Previous studies have documented the use of these options of treatment alone or together with the hospitals in developing countries (34,35). This is a reflection of their beliefs of the causes of their problems. It may also be an insight into issues of lack of access and availability of medical services in the study areas. In the study area, which has an estimated population of 5.9 million in 2013 there are only two medical centres that have clinics for couples with infertility but have no assisted reproductive technique (ART) option (36).

In our study, awareness of treatment options such as drugs and surgery was high, but less than a third had an awareness of ART. This is lower than the rate of 51.8% reported from Lagos, which is Nigeria's largest city and significantly below the 90% reported in studies from high resource settings (Belgium, France, Germany, Italy, Sweden, USA and Australia) (37,38). ART is an advanced and effective treatment option, but it has limited availability in most of sub-Saharan Africa (39). It is only available in private health facilities found in major cities. In Nigeria, most of the private ART centres are located in Lagos (37,40). It is, therefore, not surprising that most of our respondents were not aware of it.

Only 12.8% of the women were aware of adoption as a solution to infertility. In developed countries, many couples may be willing to adopt babies and some resort to international adoption due to fewer opportunities in their countries. The situation is rather different in developing countries where adoption is not common and is not seen as a solution to infertility (41,42). Lack of appropriate laws on adoption and its perception as evidence of an inability to bear children limit its utilisation (43). In most Muslim societies, adoption as a solution to infertility is not an attractive option due to an emphasis on purity of family lineage and the issue of blood relationship as the basis of inheritance under Shari'a laws (44). Public enlightenment and provision of legislation on adoption may change its perception and practice.

Healthcare requires investment in human and material resources for its sustainability. Many of the RH care services are either free or heavily subsidised in developing countries as a result of government policy and partnership with international development agencies (45). Infertility, however, does not enjoy such a privilege, and patients bear the expenses involved in its care (19). In our study, the majority of the respondents had spent more than 50 000 Naira (US\$250) by the time they presented to the gynaecology clinic. The amount is huge in comparison to the nation-

al monthly minimum wage of 18000 Naira (less than US\$100) (46). A substantial number of the women in our study believed the government should pay for infertility services as it does for family planning services. Studies in other developed countries have also revealed a high level of public support for reimbursement of infertility treatment (38). As part of the program to achieve universal access to RH care, governments in sub-Saharan Africa need to consider including infertility care in the RH package. Our study found a low level of knowledge of causes of infertility and belief in supernatural forces is common among the infertile women studied. Women bear the blame for infertility in most cases and the majority of our participants initially sought for care from traditional and spiritual healers. Infertile women want the infertility service to be a health priority of public hospitals and want the government to pay for infertility services. There is a need for initiatives to improve RH education in the study area. A major limitation of our study is its hospital-based nature. Although we recruited patients from the only two hospitals that offer infertility services in the area, it is still likely that those who did not seek hospital care may differ in certain ways and caution is required in extrapolating the data to all infertile women. Interviewer-bias is a possibility, but the use of a structured questionnaire and training sessions before the commencement of the study would have minimised this effect. There is also a possibility that our respondents may have provided “socially” correct answers to some of the questions, as infertility is a private matter and hardly discussed in the open. However, the clinical setting and communication about the confidentiality of the responses may have assisted the participants to disclose honest answers.

Ethical Issues

The study obtained ethical approval from the ethics committees of the two hospitals and the University of Sydney, Australia. All subjects gave an informed consent before enrolment into the study.

Conflict of Interests

We hereby declare that there is no conflict of interests

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