

Assessment of Anxiety Levels of Infertile Women and Couples Presenting for *In-vitro* Fertilization Procedure in Africa

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Abstract

Background: *In-vitro* fertilization treatment can be a stressful experience to infertile women and couples.

Objective: To evaluate anxiety levels of infertile women who consulted for *In-vitro* fertilization. Spousal support is discussed.

Method: Participants were 172 infertile women, accompanied by spouses or not and either debutant or repeating *In-vitro* fertilization procedure. State-Trait Anxiety Inventory was adopted and modified to measure individual woman's and couple's level of anxiety during the session. Responses were recorded on Likert's scale of 0 (no anxiety) to 3 (severe anxiety).

Result: The means (\pm sd) of age (years), body mass index (kg/m²), duration of marriage (years) and duration of infertility (years) of the patients were 38.0 (6.0), 27.8 (5.4), 8.0 (5.3) and 1.9 (0.9) respectively. The mean ages of first-timers (36.6 years) and of those repeating the procedure (38.4) were significantly different (P-value =0.04). Most participants were married (168, 97.7%) and were professionals (60, 34.9%). Infertile women were 1.59 times more likely to consult alone when the cause of infertility is female factor ($\chi^2=1.91$, p-value=0.17, OR=1.59, 95% CI=0.82, 3.09), 1.72 times more likely to consult with spouse when the cause of infertility is male factor ($\chi^2=1.23$, p-value=0.27, OR=1.72, 95% CI=0.65, 4.53) and 3.48 times more likely to repeat IVF attempt when the cause of infertility is female factor ($\chi^2=8.21$, P-value=0.004, OR=3.48, 95% CI=1.43, 8.47). First-timers were about 1½ times more likely to express severe form of anxiety than those repeating IVF ($\chi^2=1.04$, P-value=0.31, OR=1.46, 95% CI=0.71, 3.02). First-timers consulting unescorted by spouse were over 2½ times more likely to exhibit severe form of anxiety than those accompanied ($\chi^2=1.64$, P-value=0.20, OR=2.69, 95% CI=0.58, 12.60). Expectation of positive outcome was the main source of anxiety among many (38, 22.1%) participants.

Conclusion: Results from this study support the implementation of counseling intervention for all *In-vitro* fertilization individual women and couples.

Keywords: Anxiety levels; Counseling; *In-vitro* fertilization; Africa

Abbreviations: ART: Assisted Reproduction Technique; CI: Confidence Interval; BMI: Body Mass Index; IVF: *In-vitro* Fertilization; NFC: Nordica Fertility Center; sSA: sub-Saharan Africa; OR: Odds ratio; STAI: State-Trait Anxiety Inventory

Current Knowledge on the Subject

Fertility problems and the fertility treatment itself tend to place a lot of stress on the emotional and sexual relationship of the infertile couple.

Infertility is stressful because it threatens the person's plan to have a child, which is highly valued.

Apart from gynecological reasons, main reason why women undergoing IVF need counseling is consideration of the disruption to the daily routine of their lives, especially domestic obligations, family, work and emotional aspect of their lives.

What this Study Adds?

Infertility was more prevalent among professional women such as medical doctors, dentists and engineers.

A higher proportion of couples undergoing IVF for the first time recorded severe anxiety compared with couples who were for repeat IVF.

Main source of anxiety among infertile women for IVF was expectation of a successful IVF more than cost of IVF.

Introduction

Though infertility is regarded as a growing health and psychological problem worldwide, between 20%-50% couples in child-bearing age go through fertility problems in sub-Saharan Africa (SSA) with about 30% diagnosed with infertility [1]. Nowadays, involuntarily infertile women choose assisted reproduction technique (ART) to correct their infertility. Especially in African social setting, infertility – almost a taboo in many parts of the continent – elicits family pressure, feeling of guilt, inadequacy, depression and regrets amongst most women. Infertility, a stressful situation, threatens the woman's plan and aspiration for a child, which is highly valued [2] and also places undue pressure on the emotional and sexual relationship of the infertile couple [3]. Many authors agree that infertility is an undeniably major life crisis which is psychologically traumatic for many couples [4-6]. Infertile couples

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are consoled by the ability to assess a wide variety of support and care such as *In-vitro* fertilization (IVF), a unique support that is currently available for women seeking assisted reproduction. However, a world of psychological feelings, anxiety, doubts, expectation and pressure lurks behind IVF. The burdens of IVF treatment — daily injections, semen analysis, use of donor eggs, donor selection, scans, and invasive procedures — may be a cause of distress to both partners [7]. Quite naturally, women about to undergo IVF may develop mixed feelings towards this process of assisted reproduction. Studies have shown that women with infertility problems demonstrate elevated anxiety levels during assisted reproduction treatment [8,9]. Uncertainty — an important psychological frame of mind among debutants or those repeating ART — habitually generates anxiety, worry, unease, nervousness or fear. Some of the directions of this uncertainty are: “after all, the pregnancy may not occur”, “I/We are not conversant with the procedure”, “which drugs / medications will be used”, “what complications of the drugs / medications or procedure should I expect”, and “I/We are not familiar with the counselor and medical staff of the facility.” Earlier users of IVF procedure may be familiar with treatment failure and are often confronted with emotionally difficult treatment choices, such as whether or not to freeze embryos [10] or accept donor gametes. Therefore, couples for ART should have an expert who they can freely approach and talk to them about their concerns and anxiety. Pre-ART counseling is a process where individual infertile woman or couples have the chance to clear their minds and correct any misconceptions and thoroughly appreciate and deeply understand themselves and their present situation. Apart from gynecological reasons, the main reason why women undergoing assisted reproduction need counseling is the consideration of inevitable disruption to their daily routine such as (i) domestic obligations, (ii) family (iii) work and (iv) emotional aspect of their lives. Therefore, those seeking assisted reproduction need an expert who they can freely approach and talk to about their concerns and anxiety. Some authors advocate the necessity of psychosocial counseling at all stages of IVF treatment [11,12]. The Human Fertilization and Embryology Authority stipulates that the following tasks of counseling can be differentiated in the perspective of infertility treatment: information gathering and analysis, implications and decision-making counseling, support counseling and therapeutic counseling [13]. A study used couple-format survey, focusing on narrative capacities, to describe pre-IVF counseling intervention [14] and another used a 10-week session in cognitive-behavioral group and a support group to elicit pre-IVF uncertainty among infertile couples [15]. The eventual outcome was healthier scores on several psychological variables such as anxiety, marital distress, confusion, mood disturbance, stress management skills, health-promoting style and vigor among intervention than among control groups. Despite the high agreement on the necessity of counseling IVF patients, there is scarcity of studies on counseling of infertile women undergoing assisted reproduction, especially in sub-Saharan Africa. A major lacuna is also found in the participation of spouses or male partner’s involvement in the management of infertility [16,17]. This study explored the concerns of infertile women or couples consulting for IVF and reported the most important findings of its psychosocial part. The objectives of this study were to (i) evaluate anxiety levels of infertile women undergoing first time or repeat IVF (ii) appraise spousal support for infertile women undergoing IVF.

Methodology

This study was placed within a combined study framework of qualitative methodology whereby participants were prompted to speak on their concerns and anxiety over IVF and a quantitative methodology in which the responses provided as well as anthropometric data of the

patients were analyzed. Initially, 200 patients were included in the study. However, 28 (14.0%) couples repeating IVF decided not to talk about their concerns and were excluded from further analysis, leaving a total of 172 patients. These patients were first divided into 2 groups of those having their first IVF (n=38) and those repeating IVF (n=134) and later segregated into infertile women who came alone (n=52) and those who came with their spouses (n=120). The venue of each interview was the office of the Counselor at the acupuncture unit of NFC, a well-lit and ventilated place for the ease and comfort of the patients.

Study participants – Informed consent and ethical approval

Participants were mostly residents in metropolitan Lagos. The inclusion criteria to participate in the study were that there was an indication for IVF treatment; that the patient must be in current or intending conjugal relationship; and no severe psychological problems as assessed by a physician during client’s initial visit to the hospital. Simple random sampling technique of one out of every five infertile women was used to recruit the participants. Each participating infertile woman was interviewed individually or in company of her spouse. A modified State-Trait Anxiety Inventory (STAI) was adopted and adapted as an in-house questionnaire for each infertile woman or couple. The participants selected were informed about the aim and objectives, procedures and ethical considerations of the study. Informed consent provided by the participants included use of all their data for research and teaching purposes. The patients were informed that there was no potential harm or deprivation of any benefits accruing to them by participating in the study. They were also assured of the confidentiality and protection of their privacy. Ethical approval was given by the State Ethics Committee.

Patients’ flow for counseling before IVF

In our health facility where this study was carried out, counseling is the first step before an individual infertile woman proceeds to the stage of medical examination prior to IVF procedure.

Data collection method

The modification in the study instrument (questionnaire) was connected to description of the feelings and thought of participants as accurate as possible and on the procedure of IVF they were about to undergo or had just undergone (among those repeating IVF). The study instrument was also adjusted to fit into an infertility-specific stress questionnaire model. The individual women or couples were informed that they could withdraw from the study at their own choice and that they were free to respond or decline to answer any question they think was sensitive, personal or threatening.

Format of the “interview”

The study was not structured strictly along the rigid interview format but was more like a dialogue between the counsellor and the patient. At the commencement of the dialogue, the counsellor, who must have read the preliminary medical records of each patient, introduced herself by name, profession and responsibility. She used her prior knowledge of the information on the patients’ medical records to gain their confidence and thus establish a rapport for open and frank conversation. After the introductory phase, each client was asked to discuss her feelings and opinions about infertility and her choice of IVF. To start the counseling, clients were asked to relate their concerns or anxiety on issues such as procedures of IVF, cost and affordability, donor gametes and family pressure, husband’s feelings, and other matters itemized on the counselor’s list. Responses such as “It doesn’t bother me” scored 0 anxiety; “I’m a little concerned” scored 1; “I am

bothered” scored 2 and “That is very disturbing” or “That is quite worrying” scored 3 on the modified anxiety scale. Responses such as “I or We don’t want to talk about it” was not graded on the anxiety scale.

Data analysis and presentation

Qualitative responses from the patients were coded and recorded on Likert’s scale of 0-3. Quantitative data such as age, BMI, years of marriage, and duration of infertility were extracted from the patients’ medical records. All data were entered into laptop computer, cleaned and analyzed using STATA 13 statistical software. Data were presented as mean and standard deviation. Chi-square test, including Odds Ratio and 95% Confidence Interval, was used to test the significance of proportions between the different groups of infertile women who consulted alone and those who consulted in company of spouses as one group and those who came for their first IVF versus those repeating IVF as another group. Student’s t-test was used to evaluate significant differences in means between these two groups. Data were presented as Tables and Figure. A P-value of <0.5 was regarded as significant.

Results

A total of 200 infertile women were initially approached for inclusion into the study but 28 couples either declined to comment on their sources of anxiety, or they supplied inadequate data or declined outright to participate in the study and were therefore excluded from the study, leaving 172 (86.0%) participants who provided answers for analysis.

Sociodemographic characteristics of participants

The mean (\pm sd) of the 172 participants was 38.0 (6.0) years. Of these 172, 52 (30.2%) consulted alone and 120 (69.8%) consulted in company of their spouses; also of this 172, 38 (22.1%) were consulting for IVF for the first time and 134 (77.9%) were repeating IVF. There was no statistically significant difference in the mean age of those who came alone (38.6 years) compared with those who came with their spouses (37.7 years) but the mean age of those repeating IVF

(38.4 years) was significantly different ($p=0.04$) from that of patients coming for IVF for the first time (36.6 years). The mean (\pm sd) body mass index (BMI) of the participants was 27.8 (5.4) kg/m², while the means (\pm sd) of duration of marriage and of infertility of the infertile women were 8.0 (5.3) and 1.9 (0.9) years respectively. Majority (168, 97.7%) of the participants were married and a high proportion of them (60, 34.9%) were professionals. The four women who were classified as single initially had matrimonial relationships. However, three of them lost their husbands, one divorced and all were about to remarry. Hence their data was included in the analysis (Table 1).

Sociodemographic characteristics of excluded patients

Incidentally, all who were excluded came for repeat IVF. There were no statistically significant differences in the means of age (37.8 years), body mass index (28.9 kg/m²), duration of marriage (7.1 years) and duration of infertility (1.8 years) of the 28 women who were eventually excluded from the study compared with those of the study participants. However, all excluded patients were married and majority of them were also professionals (12,42.9%) (Table 2).

Cause of infertility, mode of consultation and number of IVF attempts

Infertile women were 1.59 times likely to consult alone than with spouse when the cause of infertility is female factor ($\chi^2=1.91$, p -value=0.17, OR=1.59, 95% CI=0.82, 3.09); 1.72 times more likely to consult with spouse when the cause of infertility is male factor ($\chi^2=1.23$, p -value=0.27, OR=1.72, 95% CI=0.65, 4.53) and 1.22 times more likely to consult with spouse in case of combined factor as cause of infertility ($\chi^2=0.32$, P -value=0.57, OR=1.22, 95% CI=0.62, 2.40). On the other hand, infertile women were 3.48 times more likely to repeat IVF attempt when the cause of infertility is female factor ($\chi^2=8.21$, P -value=0.004, OR=3.48, 95% CI=1.43, 8.47).

They were also 1.22 more likely to have a first attempt at IVF when male factor is the cause of infertility ($\chi^2=0.16$, P -value=0.69, OR=1.22, 95% CI=0.47, 3.12); 1.91 more likely to do so in combined factor as

Variable	Item	All	Females who came alone	Females who came with spouse	P-value	First-time IVF	Repeat IVF	P-value
Frequency	(%)	172 (100.0)	52 (30.2)	120 (69.8)	-	38 (22.1)	134 (77.9)	-
Age (years)	Mean (\pm SD)	38.0 (6.0)	38.6 (5.9)	37.7 (6.1)	0.18	36.6 (5.5)	38.4 (6.1)	0.04
Body Mass Index (Kg/m ²)	Mean (\pm SD)	27.8 (5.4)	27.6 (4.8)	27.9 (5.7)	0.36	28.6 (5.1)	27.7 (5.5)	0.17
Duration of marriage (years)	Mean (\pm SD)	8.0 (5.3)	7.7 (5.3)	8.2 (5.3)	0.29	7.3 (5.7)	8.3 (5.1)	0.20
Duration of infertility (years)	Mean (\pm SD)	1.9 (0.9)	1.8 (0.9)	1.9 (1.0)	0.26	1.7 (1.0)	1.9 (0.9)	0.20
Marital status	Single	4 (2.3)	4 (7.7)	0 (0.0)	0.012*	1 (2.6)	3 (2.2)	0.64*
	Married	168 (97.7)	48 (92.3)	120 (100.0)		37 (97.4)	131 (97.8)	
Occupation	Management	1 (0.6)	0 (0.0)	1 (0.8)	-	0 (0.0)	1 (0.7)	-
	Professional	60 (34.9)	20 (38.5)	40 (33.3)	-	12 (31.6)	48 (35.8)	-
	Technical/ Associate professional	8 (4.6)	4 (7.7)	4 (3.3)	-	2 (5.3)	6 (4.5)	-
	Support service	38 (22.1)	9 (17.3)	29 (24.2)	-	4 (10.5)	34 (25.4)	-
	Service/Sales worker	13 (7.5)	3 (5.8)	10 (8.3)	-	4 (10.5)	9 (6.7)	-
	Trading	37 (21.5)	13 (25.0)	24 (20.0)	-	9 (23.7)	28 (20.9)	-
	Housewife	7 (4.1)	1 (1.9)	6 (5.0)	-	4 (10.5)	3 (2.2)	-
	Student	2 (1.2)	0 (0.0)	2 (1.7)	-	0 (0.0)	2 (1.5)	-
	Self-employed	5 (2.9)	2 (3.9)	3 (2.5)	-	2 (5.3)	3 (2.2)	-
Unemployed	1 (0.6)	0 (0.0)	1 (0.8)	-	1 (2.6)	0 (0.0)	-	

*Fisher’s exact test

Table 1: Baseline socio-demographic characteristics of participants who came for counseling at Nordica Fertility Center between 2008 and 2014.

Variable	Item	All	Females who came alone	Females who came with spouse	Repeat IVF
Frequency	Number (%)	28 (100.0)	19 (67.9)	9 (32.1)	28 (100.0)
Age (years)	Mean (\pm SD)	37.8 (6.0)	37.3 (5.7)	38.6 (6.7)	37.4 (4.4)
Marital status	Single	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Married	28 (100.0)	19 (67.9)	9 (32.1)	28 (100.0)
Body Mass Index	Mean (\pm SD)	28.9 (5.0)	28.9 (5.52)	28.9 (4.4)	28.0 (3.4)
Duration of marriage (years)	Mean (\pm SD)	7.1 (5.2)	7.3 (5.0)	6.8 (6.0)	5.6 (2.8)
Duration of infertility (years)	Mean (\pm SD)	1.8 (1.0)	1.8 (1.0)	1.8 (1.0)	4.0 (3.0)
Occupation	Management	0 (0.0)	0 (0.0)	0 (0.0)	0 (100.0)
	Professional	12 (42.9)	10 (83.3)	2 (16.7)	12 (100.0)
	Technical/Associate professional	1 (3.6)	0 (0.0)	1 (100.0)	1 (100.0)
	Support service	9 (32.1)	4 (44.4)	5 (55.6)	9 (100.0)
	Service/Sales worker	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Trading	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Housewife	4 (14.3)	3 (75.0)	1 (25.0)	4 (100.0)
	Student	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Self-employed	1 (3.6)	1 (100.0)	0 (0.0)	1 (100.0)
	Unemployed	1 (3.6)	0 (0.0)	1 (100.0)	1 (100.0)

Table 2: Baseline socio-demographic characteristics of participants (all repeat IVF) who came for counseling at Nordica Fertility Center between 2008 and 2014 but were excluded from the study.

Cause of infertility	Mode of consultation		χ^2	P-value	Odds Ratio	95% Confidence Interval	IVF attempt		χ^2	P-value	Odds Ratio	95% Confidence Interval
	Alone	With spouse					First time	Repeat				
	Freq. (%)	Freq. (%)					Freq. (%)	Freq. (%)				
Female factor	24 (46.2)	42 (35.0)	1.91	0.17	1.59	0.82, 3.09	7 (18.4)	59 (44.0)	8.21	0	0.29	0.12, 0.70
					0.63	0.32, 1.22					3.48	1.43, 8.47
Male factor	6 (11.5)	22 (18.3)	1.23	0.27	0.58	0.22, 1.53	7 (18.4)	21 (15.7)	0.16	0.69	1.22	0.47, 3.12
					1.72	0.65, 4.53					0.82	0.32, 2.11
Combined factor	18 (34.6)	47 (39.2)	0.32	0.57	0.82	0.42, 1.62	19 (50.0)	46 (34.3)	3.09	0.08	1.91	0.92, 3.97
					1.22	0.62, 2.40					0.52	0.25, 1.08
Others	4 (7.7)	9 (7.5)	0.07*	0.79	1.03	0.30, 3.50	5 (13.2)	8 (6.0)	2.19	0.14	2.39	0.73, 7.78
					0.97	0.29, 3.31					0.42	0.13, 1.37

Table 3: Chi-square and Odds ratio analysis of mode of consultation and IVF attempts relative to cause of infertility.

cause of infertility ($\chi^2=3.09$, P-value=0.08, OR=1.91, 95% CI=0.92, 3.97) and 2.39 times more likely to make a first IVF attempt for other causes of infertility ($\chi^2=2.19$, p-value=0.14, OR=2.39, 95% CI=0.73, 7.78) (Table 3).

Figure is a graphical illustration of factors causing infertility and the pattern of consultation, that is those who came alone or escorted by spouse and those who came for their first IVF or were repeating the procedure. A high proportion (46.2%) of infertile women consulted alone rather than accompanied by a spouse (35.0%) when the cause of infertility was female factor. This high proportion of infertile women also consulted unescorted when the cause of infertility was combined factor (34.6%), male factor (11.5%) or explained factor (7.7%) (Figure 1).

Also, initial consultation for infertility was observed more among couples with combined factor as the cause of their infertility (50.0%) than among those with either female (18.4%) or male (18.4%) factor as the cause of infertility. Repeat IVF procedure was found more among women with female factor as cause of their infertility (44.0%) than those with combined cause of infertility (34.3%) or male factor of infertility (15.7%). The figure also shows that genetic factor and sex selection were not prominent causes of why women consult for infertility.

Expression of anxiety

Overall, there was no significant difference in the proportion of

women who indicated no anxiety compared with those who indicated some anxiety. Regardless of whether they came alone or with their spouses, infertile women coming for IVF for the first time were about 1½ times more likely to express severe form of anxiety than those repeating IVF ($\chi^2=1.04$, P-value=0.31, OR=1.46, 95% CI=0.71, 3.02).

Also, those who came for IVF for the first time without a spouse were over 2½ times more likely to exhibit severe form of anxiety compared to those who came with their spouses ($\chi^2=1.64$, P-value=0.20, OR=2.69, 95% CI=0.58, 12.60). In addition, those who, for any reason, came alone for repeat IVF were almost thrice as likely to indicate severe form of anxiety compared to those who came with spouses ($\chi^2=6.34$, p-value=0.01, OR=2.99, 95% CI=1.25, 7.17). Furthermore, couples who were repeating IVF were over 1½ more likely to indicate severe form of anxiety than couples coming for their first IVF ($\chi^2=1.31$, p-value=0.25, OR=1.64, 95% CI=0.26, 1.43) (Table 4).

Perceived causes of anxiety

As shown in Table 4, expectation of a positive result was the major cause of anxiety among individual infertile women coming for IVF for the first time (6/38, 15.8%) and those repeating IVF (32/134, 23.9%) as well as those who came alone (10/52, 19.2%) and those who came with their spouses (28/120, 23.3%). Other causes of anxiety included use of donor eggs (20, 11.6%) cost of IVF (15, 8.7%) and implantation failure (3, 1.7%) (Table 5).

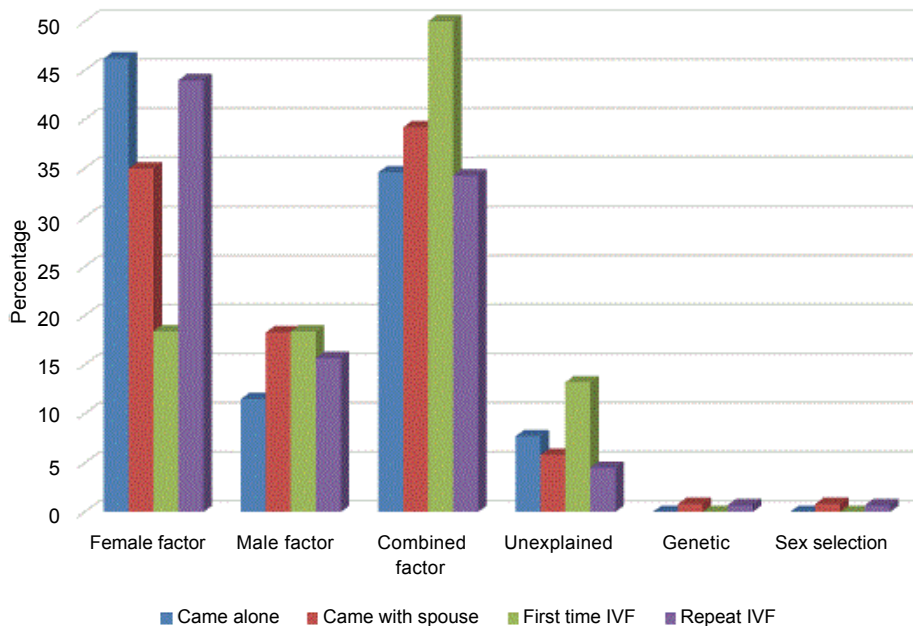


Figure 1: Causes of infertility among infertile females that came alone or with spouse or those for first time or repeat IVF.

Variable	No anxiety Freq. (%)	Mild anxiety Freq. (%)	Moderate anxiety Freq. (%)	Severe anxiety Freq. (%)	χ^2	P-value	Odds Ratio	95% Confidence Interval
First time IVF	11 (28.9)	0 (0.0)	5 (13.2)	22 (57.9)	1.04	0.31	1.46	0.71, 3.02
Repeat IVF	44 (32.8)	4 (3.0)	21 (15.7)	65 (48.5)			0.69	0.33, 1.42
Came for IVF for the first time with spouse	8 (28.5)	0 (0.0)	5 (17.9)	15 (53.6)	1.64	0.20	0.37	0.08, 1.74
Came for IVF for the first time without spouse	3 (30.0)	0 (0.0)	4 (40.0)	3 (30.0)			2.69	0.58, 12.60
Came alone for repeat IVF	11 (26.2)	4 (9.2)	19 (45.2)	8 (19.0)	6.34	0.01	2.99	1.25, 7.17
Came with spouse for repeat IVF	33 (35.9)	4 (4.3)	17 (18.5)	38 (41.3)			0.33	0.14, 0.80
Couples for first time IVF	8 (28.6)	0 (0.0)	5 (17.9)	15 (53.6)	1.31	0.25	1.64	0.70, 3.84
Couples for repeat IVF	33 (35.9)	4 (4.3)	17 (18.5)	38 (41.3)			0.61	0.26, 1.43

Table 4: Chi-square analysis of proportion of patients with varying anxiety levels among different categories of sub-fertile women consulting for IVF.

Variable	First-time IVF (n=38)		Repeat IVF (n=134)		Total (%)	Came alone (n=52)		Came with spouse (n=120)		Total (%)
	Freq.	%	Freq.	%		Freq.	%	Freq.	%	
Expectation of positive result	6	15.8	32	23.9	38 (22.1)	10	19.2	28	23.3	38 (22.1)
Use of donor eggs	2	5.3	18	13.4	20 (11.6)	9	17.3	11	9.2	20 (11.6)
"Would services at NFC guarantee success?"	2	5.3	12	9.0	14 (8.1)	1	1.9	13	10.8	14 (8.1)
Cost of IVF	3	7.9	12	9.0	15 (8.7)	5	9.6	10	8.3	15 (8.7)
Personal issues (Family pressures)	1	2.6	8	6.0	9 (5.2)	1	1.9	8	6.7	9 (5.2)
Fear of IVF procedure	0	0.0	4	3.0	4 (2.3)	1	1.9	3	2.5	4 (2.3)
Implantation failure	0	0.0	3	2.2	3 (1.7)	2	3.8	1	0.8	3 (1.7)

Table 5: Main sources of anxiety among infertile women preparing for IVF.

Discussion

There are currently very few studies in sub-Saharan Africa (sSA) that have assessed anxiety levels among sub-fertile patients who were presenting for their first IVF or repeating the process. There are also few studies that have looked into spousal support during IVF in sSA. To be best of our knowledge, this is the first study in this part of the world to delve into the psychosocial aspect of patients prior to undergoing IVF in sSA. There are certain key findings from this study. First, infertility was found to be commoner among women in professional occupations such as medical doctors, dentists, lawyers and engineers. This agrees

with studies which reported that workplace exposures and hazards have detrimental effects on the reproductive system such as subfertility, delayed conception and early pregnancy loss [18,19]. Professional women possibly postponed child-bearing till the fulfillment of their aspiration to achieve high standard of education and professionalism. About 40% of infertile women who came alone and 30% of those who came for the first time for IVF were professional women, indicating that, after achieving their professional goal, these women later sought assistance in fertility probably because of advancing age, peer pressure, fulfillment of womanhood or having their own family. This might be the subgroup of seriously stressed individual infertile women or

couples that an earlier study indicated as requiring professional psychological help [20].

Secondly, close to 50% of infertile females who consulted for IVF without their spouses' presence had female factor as the cause of their infertility. Shock and disbelief may be the first reaction that strikes a woman who is involuntarily infertile, when she discovers that, after weeks or months of unprotected sexual intercourse, she has not conceived. To confirm the cause or causes of their infertility, infertile women most likely seek for an answer to questions such as: "Why am I not getting pregnant?" "What is wrong with me?" An earlier study indicated that such emotional responses to infertility problems could lead to depression, anger, guilt, frustration and sadness [21]. On the other hand, only 18% of infertile women who came with their spouses had male factor as the cause of their infertility. This is in consonance with previous works which argued that since women are ultimately the ones to conceive and become pregnant, infertility is often regarded as a woman's problem whether or not the cause has been determined to be male factor infertility [1,22-27]. This is probably because male factor, as cause of infertility, may be fewer than female factor; both social and societal factors in sSA often dictate women's disposition and desperation in child-bearing; and pregnancy and motherhood symbolize an intense developmental landmark that is extremely celebrated [28,29]. Societies lay significant emphasis on motherhood [30], thus childless individuals are often stigmatized [31,32] as they are viewed as culturally deviant [6,33], an anathema to most African women. Furthermore, it is a common belief in many sSA communities that the cause of infertility is due to female factor and not from men who are often regarded as reproductively normal and healthy. In recent times, especially among educated women, lack of pregnancy often lead to persuasion of the male partner for a joint medical check-up based on advice from a colleague, a medical doctor, information from mass media or from a family member.

Another key finding was that regardless of time of presentation for assisted reproduction – first time or repeat – and irrespective of whether she was coming alone or with her spouse, consultation for IVF was associated with certain level of anxiety. Surprisingly, anxiety was more common among those repeating IVF (76.9%) than among those who came with their spouses (67.5%), a finding similar to what others [4,5] reported. Anxiety and major depressive episodes are the most commonly diagnosed psychiatric problems experienced especially by infertile women [34] and often, these women presented with psychological distress levels similar to patients with terminal illnesses such as cancer, heart disease and hypertension [35].

Infertile women who came alone to consult for IVF for the first time were 2.69 times more likely to express severe anxiety than those who came for IVF for the first time with their spouses. This is similar to a study which found that women who consulted alone reported more despair before and after infertility treatment [7]. Conceivable reasons for this are lack of support from spouses' presence which may have acted as a stabilizing force to reduce anxiety in the woman. Furthermore, combined decision-making would probably have been faster and more cogent. Decision-making to undergo an IVF is most likely a vital aspect of marital life in such a situation as infertility. The infertile women who consulted with their spouses most likely must have felt secured with the awareness that her marital partner was by her side to support the agony of childlessness, the desperation she was going through and the dilemma of assisted infertility. In sSA, an infertile woman is often threatened, insulted or ignored at home, among peers or at work on account of her barrenness. These reactions to female infertility and women's apparent helplessness to correct the problem are probable sources of anxiety and a feeling of being irrelevant among females.

Also, infertile women who came alone for repeat IVF were almost thrice likely to show severe anxiety than those who came with their spouse for repeat IVF. There is currently no health insurance for the treatment of infertility, thus individual women or couples spend catastrophic out-of-pocket expenditure to correct infertility. Additionally, poor result of previous IVF treatment(s) may have been disappointing to the infertile woman who had high hopes of getting pregnant at the first IVF treatment. Rejection of such poor IVF outcome may contribute to severe anxiety among the infertile woman. Spousal presence perhaps reduces stress of infertility burden. This reflects what was described in earlier studies as display of 'symbiotic and clinging' relational pattern [36] or greater marital satisfaction [37,38]. Couples coming for IVF for the first time were about twice likely to express severe anxiety than those repeating IVF. This seems to agree with a study from South Africa that reproductive decisions are influenced by the social, economic and political structure of a society [10]. Couples who have had at least one attempt at IVF show more interest in counseling [12]. Steering counseling interventions towards couples who are coming for IVF for the first time may be of greater benefit than previously anticipated.

Conclusion

To conclude, this study found that many individual infertile women or couples coming for IVF have moderate to severe levels of anxiety. There is an increasing need for an understanding of the psychosocial implications of impaired fertility and its management. Individual infertile women or couples require counseling sessions to address anxiety which may lead to depression.

Limitations and Strength

The perceived limitations and strength in this study need explanation. First, a convenient sample size consisting of all those who agreed to participate was used for the study. Secondly the study was conducted in just one facility and the results may not be representative of the expression of anxiety in other parts of the country or the continent. Thirdly, we did not study the expression of anxiety according to the religious affiliations, ethnicity or geographical location of participants. Expression of anxiety, especially as relating to IVF procedure, might be different in low-lying plains than in the mountainous areas, in the various surrounding islands and among rural and urban dwellers. The strength of this study pertained to the fact that participants were interviewed many times before, during and after IVF procedures to give validity to their anxiety levels. Also these interviews took place privately in well-lit and air-conditioned consulting rooms where patients were made to feel at ease to discuss issue with the expert and not-coerced. Interviewers are expert in the field of psychology and acupuncture.

Conflict of Interest

The authors declare no conflict of interest.

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