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Functional status and quality of life of women with infertility in Southern Ghana: A cross-sectional study

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Abstract

Background: The desire to have children seems more intense in cultures that perceive childbearing as the primary reason for marriage. In such cultures, infertility reduces the functional status of women.

Objective: This study investigated the relationship between functional status and quality of life of women with infertility in selected fertility centres in Ghana.

Methods: A total of 167 women were recruited from four infertility treatment hospitals in Southern Ghana. Two standardised questionnaires were used: Functional Status and the Fertility Quality of Life questionnaire (FertiQol). A cross-sectional design was used to examine the relationship between functional status and fertility-related quality of life (FertiQol). Pearson product-moment correlation and multilinear regression analysis were performed using the Statistical Package for Social Science (SPSS) version 20.0.

Results: The result of the Pearson product-moment correlation showed a statistically significant strong positive correlation between mental health and core areas (emotional, mind/body, relational and social) of fertility-related QoL (r = 0.616, p < 0.001). The regression analysis indicated the demographic characteristics and functional status of the women collectively explained approximately 44% of the variance in the women's Core FertiQoL (R2 = 0.437, F (12, 125) = 8.081, p < 0.001). Individual evaluation of the predictors showed that mental health (p < 0.001) and quality of social interaction (p = 0.005) statistically significantly contributed to the functional status of the women.

Conclusion: The findings suggest that to improve the quality of life (QoL) of women's infertility, their quality of social interaction, mental health, and work performance should be considered in their treatment and general care.

INTRODUCTION

The World Health Organization has reported that infertility affects one in every six people globally [1]. In Africa, infertility is traditionally a woman's problem, and this has many negative influences on the woman's quality of life (QoL). An African woman without a biological child is chastised, mocked by others, thrown out of her husband's home, and left insecure [2,3]. For this

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reason, the African woman may not hesitate to undergo any procedures, whether medical or traditional, to achieve a pregnancy. Therefore, the experience of infertility and the search for a solution greatly affects the health-related quality of life (HRQoL) of these women [4]. A systematic review and meta-analysis revealed that 49.9% and 48.8% of the African population suffer from primary and secondary infertility, respectively [5]. In sub-Saharan Africa, more than 30% of women suffer from secondary infertility [6]. There is limited research on the prevalence of infertility in Ghana. However, in a retrospective study conducted in the Central region of Ghana, the prevalence of

infertility was found to be 12.3% [7]. Although the scientific evidence on the consequences of infertility on women, such as divorce, stigmatisation, emotional stress, depression, and anxiety, are enormous [8], the health-related quality of life (HRQoL) of women with infertility in Africa is limited in the literature. Functional status is an individual's ability to perform normal daily activities required to meet basic needs, fulfil usual roles, and maintain health and well-being [9]. Previous research noted that infertility is a devastating experience that affects the women's physical function, general health, vitality, and social functions due to emotional and mental health issues [10]. This suggests that Women Living with Infertility (WLWI) may have difficulties living a fulfilling and happy life.

Infertility has a major influence on women's HRQoL, which extends to the woman's sexual life and satisfaction [11,12]. Meanwhile, relaxed sexual intercourse may increase their chances of conception, yet this is problematic. This puts a strain on their relationships, leading to either a threat of divorce or a breakup. In some African marriages, peace and love are almost absent when there is no biological child. The instability of marriage in infertile relationships ranges from the threat of divorce, separation, and extramarital relationships to divorce [13,14], and divorce becomes the ultimate in some parts of Africa [14]. However, in some cultural situations, the woman is forced to remain with the husband because of the bride price [14,15]. In some instances, husbands with such cultural backgrounds resort to domestic violence against the woman [13,14]. In some parts of Ghana, infertility is of great concern, as couples are socially stigmatised and barred from leadership roles in their communities [16]. Most women with infertility go through diverse, inhuman treatment in their communities [14,17,18], leading to negative psychological functions such as depression, sleeplessness, and worrying [2,19]. These women also have functional impairment, dissatisfaction with life, and job insecurity because of the effect on their job performance [20]. All these compromise their HRQoL, which is of great concern. Although studies in Ghana have reported the experiences, beliefs, and psychosocial problems among WLWI, none has explored the functional status and quality of life of these women. Thus, this study examined the functional status and fertility-related quality of life of WLWI in Southern Ghana.

MATERIALS AND METHODS

Study design and sites
A cross-sectional design was used to examine the relationship between functional status and fertility-related quality of life (FertiQol). The study was conducted in the Greater Accra Region of Ghana in four health facilities: two government-owned hospitals, Tema General Hospital and Lekma Hospital, and two private fertility centres, Accra Fertility Hospital and SamJ Fertility Hospital. The two government facilities provide a wide range of medical and fertility services and serve as a referral point for other clinics and hospitals in the region. On the private side, the Accra Fertility Hospital and SamJ Fertility Hospital offer comprehensive fertility treatments, including in-vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI), egg and sperm donation, gestational surrogacy, pre-implantation genetic diagnosis (PGD), intrauterine inseminations (IUI), and other related procedures.

Research sample and selection
The sample size was determined using approaches described by Tabachnick et al. and Cohen for correlational analysis [21,22]. According to Tabachnick et al., for a sample size to be appropriate for a target population, the following formula is applicable: (n > 50 + 8M, where n is the sample size, and M is the number of predictive variables [21,22]. With twelve predictors, the sample size was estimated to be more than 146 (n > 50 + 8(12)). A margin of 10% was added to cater for non-response. Therefore, the study targeted 161 participants. However, on the last day of data collection, more women expressed their interest in participating, which increased the sample size to 167. Women who were aged 25 years and above, desiring to conceive, medically diagnosed to have either primary and secondary infertility, or by self-report were recruited through purposive sampling from four health facilities within the Greater Accra region of southern Ghana (two government-owned hospitals and two private fertility centres). The selection of the private and public-owned hospitals was to ensure that middle to high-income earning women and low-income earning women were recruited.

Few non-treatment-seeking participants (clients who were clinically diagnosed as infertile but were no longer seeking treatment) in the community (20%, n = 33) were recruited through recommendation because non-treatment seekers may equally have impaired quality of life. Women in need of a biological child or women who may have a history of infertility but have undergone structured psychosocial counselling and had comorbid conditions were excluded.

Data collection, tools and procedure
Two (2) standardised questionnaires (the Functional Status Questionnaire and the Fertility QoL questionnaire (FertiQoL) were used for data collection [23]. The Functional Status Questionnaire was used to solicit information on the physical, psychological, social, and role functions of women with infertility. Response alternatives varied between five-point and six-point Likert scales with a total of 32 items and required 15 minutes to complete. The items were grouped under five parameters (Basic Activities of Daily Living [BADL] and scored on an interval scale of 0-100 for intermediate activities of daily living, mental health, work performance, social activities, and quality of interaction), which the responses ranged from zero (0) to four (4). The activities were measured on two levels: warning zone and good. The activities for each subscale were measured on two levels: warning zone and good. For each of the subscales, the cut-off points for warning zones were mental health (0 - 70), work performance (0 - 78), social activities (0-78) and quality of social interactions (0 -

69) [24]. The fertility QoL questionnaire (FertiQoL) [23] assessed the influence of fertility problems in diverse life areas, like general health, self-perceptions, emotions, partnership, family and social relationships, work-life, and future life plans. The tool has a total of 36 items, and response alternatives were on a five-point Likert scale, from zero (0) to five (5). Scores on the response scale were summed and scaled to range from 0 to 100. Higher scores on the subscales and total scores indicate better quality of life. In this study, the subscales of the FertiQol had Cronbach's alphas ranging from 0.72 to 0.92, and that of the Functional Status Questionnaire ranged from 0.80 to 0.90. All these instruments were pre-tested for clarity among ten participants before data collection and administered in English. The pre-tested data were not added to the analysis.

Procedure for data collection

The ethical approval certificate and an introductory letter were sent to the recruitment centres to seek permission to recruit participants. When permission was granted, the chosen fertility centres and hospitals were contacted to seek potential participants' willingness to participate. The objectives of the study and all other details were communicated to the clients to help them make an informed decision regarding their participation in the study or otherwise. Those who agreed to participate individually signed the consent form, filled out the questionnaire after their consultations with the gynaecologist and submitted it before they left the facility. The snowball technique was used to recruit non-treatment-seeking participants. The first non-treatment-seeking participant was recommended by one of the participants enrolled in the hospital. Data was collected over three months, from November to January 2015.

Data Analysis

Data were analysed using Statistical Package for Social Sciences (SPSS) version 20.0. Before data analysis, the frequencies of all variables were computed to ensure that the data were properly entered and cleaned. Descriptive statistics were used to assess how infertility affects the functional status of women. Inferential statistics were used to assess how infertility affects the functional status of women with infertility, and Pearson's Product-moment correlation was used to examine the relationship between functional status and Fertility-related quality of life (FertiQol). Multiple regression was performed to examine the predictors of fertility-related quality of life.

Ethical approval

Ethical clearance was sought from the Noguchi Memorial Institute for Medical Research (IRB 00001276). Permission was sought from the health facilities to recruit participants. When permission was granted, a discussion was held with potential participants to seek their willingness to participate. In this discussion, the purpose of the study and all other relevant details were communicated to them to enable them to make an informed decision regarding their participation.

RESULTS

A total of 167 participants were enrolled. The mean age of participants was 34.4 (SD = 4.86). Approximately 81% (n = 135) were married. On average, 52% (n = 87) had tertiary education, and only (7.8%, n =13) had a monthly income above three thousand Ghana Cedis, GhC 3000.00 (499.48 USD). Furthermore, 65% (n = 109) of the women had conceived at least once. Approximately 47% (n = 78) rated their health as being good. In response to the question, "Are you satisfied with your QoL?" About one-third of the women were ambivalent (32.9%, n = 55), which means they were neither satisfied nor dissatisfied. Only 27.5% (n = 46) reported being satisfied with their sexual relationship. Details of the demographic characteristics are presented in Table 1.

Functional status of women with infertility

Regarding BADL, 80.2% (n = 134) of the women were classified as being in a good state and could perform their daily activities such as eating, bathing, getting out of a chair and bed, and walking indoors with no difficulty. Only 19.8% (n = 33) were in the warning zone of performing their daily activities. Furthermore, 81.4% (n = 134) were in a good state of performing their intermediate activities of daily living (able to walk several blocks, perform household chores and go shopping with no difficulty). These are the daily activities of women with infertility. Nevertheless, as many as 69.5% (n = 116) were in the warning zone of their mental health status (they felt downhearted and nervous, which suggests that infertility does not have much impact on not happy), suggesting that infertility may influence the mental health of these women. Findings also depicted that 47.3% (n = 79) of the women were in the warning zone of their work performance, and only 42% (n = 71) had a good working performance. This implies that many of these women are unable to work regular hours, perform normal duties regularly, and or do their jobs as carefully and accurately as others with similar jobs. However, 65% (n = 108) of the women were able to perform their social activities like going to church, visiting friends and relatives, and or easily calling friends and relatives. Meanwhile, 35.3% (n = 59) were in the warning zone for performing their social activities. On the contrary, 64.1% (n = 107) of the women in this study were in the warning zone for quality of social interaction, suggesting that these women have isolated themselves from people around them. They hardly act affectionately towards others and get along well with other people. Details of their functional status are shown in table 2.

The relationship between functional status and fertility QoL of women with infertility

Pearson's Product-moment correlation was computed to determine how functional status related to FertiQol. Functional status had six domains: BADL, Intermediate activities of daily living, mental health, work performance,

Table 1: Socio-demographic characteristics of participants

	Frequency	Percent
Age		
<30 years	26	15.6
31-40 years	122	73.0
>40 years	17	10.2
Unknown	2	1.2
Marital status		
Married	135	80.8
Divorced	3	1.8
Separated	7	4.2
Single	7	4.2
Cohabiting	22	13.2
Educational Level		
basic level education	80	47.9
tertiary level education	87	52.1
Level of income (Gh₵)		
<100	3	1.8
100-499	64	38.3
500-999	39	23.4
1000-1999	35	21.0
2000-2999	10	6.0
3000+	13	7.8
No income	1	0.6
Missing*	2	1.2
Religion		
Christian	146	87.4
Moslem	20	12.0
Other (Traditional Religion)	1	0.6
Have you been pregnant before?		
Yes	109	65.3
No	50	29.9
Unknown	8	4.8
How would you rate your health		
Very poor	3	1.8
Poor	12	7.2
Neither poor nor good	55	32.9
Good	78	46.7
Very good	19	11.4
Are you satisfied with your QoL		
Very dissatisfied	6	3.6
Dissatisfied	33	19.8
Neither satisfied nor dissatisfied	55	32.9
Satisfied	53	31.7
Very satisfied	20	12.0
During the past month, how satisfied were you with your sexual relationship	19	11.4
Very dissatisfied	15	9.0
Dissatisfied	34	20.3
Not sure	25	15.0
Satisfied	46	27.5
Very satisfied	26	15.6
Unknown	2	1.2

social activities, and quality of social interaction. The FertiQoL tool, which had three domains, measured QoL: Core FertiQoL (Social, Emotional, Mind-Body and Relation), Treatment FertiQoL (Environment and Tolerability of Treatment), and Total FertiQoL (Core FertiQoL and Treatment FertiQoL). There was a positive correlation between BADL ($r = 0.227$, $p = 0.003$), as well as intermediate activities of daily living ($r = 0.175$, $p = 0.024$) and the core areas of fertility-related QoL. These suggest that an increase in the scores of basic and intermediate daily living activities improves or leads to better fertility-related QoL. Also, there were significant positive correlations between the mental health of functional status and Overall Fertility Related QoL ($r = 0.225$, $p = 0.004$), as well as core areas of fertility-related QoL ($r=.616$, $p=.000$). This suggests that a unit increase in mental health leads to an increase in the Overall Fertility-related QoL and Core Areas of fertility-related QoL. Thus, good mental health of these women improves the Overall Fertility-related QoL and the Core Areas of Fertility Related QoL. Furthermore, there was a significant positive correlation between social activities of functional status and overall fertility QoL ($r = 0.194$, $p = 0.012$), the core areas of fertility QoL ($r = 0.187$, $p = 0.015$), and Total Treatment scores ($r = 0.168$, $p = 0.030$). These suggest that an increase in the scores of social activities will likely improve the women's Overall Fertility QoL, the Core Areas of Fertility QoL, and Total Treatment scores. Furthermore, there were significant positive correlations between the quality of social interaction of functional status and Overall Fertility QoL ($r = 0.312$, $p < 0.001$), the Core areas of fertility-related QoL ($r = 0.539$, $p < 0.001$), and Total Treatment ($r = 0.222$, $p = 0.004$). This suggests that an increase in the quality of social interactions of these women leads to an increase in the Overall Fertility-related QoL, the Core Areas of fertility-related QoL, as well as the total treatment. Details of these associations are shown in Table 3. A multilinear regression analysis was performed to determine if the demographic characteristics and Functional Status predicted the quality of life of women with infertility. The dependent variable (FertiQoL) has three domains (Core FertiQoL, Treatment FertiQoL, and Total FertiQoL). Therefore, all predictors were assessed based on each domain of the dependent variable. The predictive variables

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Table 2: Functional status of women with infertility

Parameters	Warning Zone n (%)	Good n (%)	Missing n (%)
BADL	33 (19.8)	134 (80.2)	0
Intermediate activities of daily living	30 (18.0)	136 (81.4)	1 (0.6)
Mental health	116 (69.5)	51 (30.5)	0
Work performance	79 (47.3)	71 (42.5)	17 (10.2)
Social activities	59 (35.3)	108 (64.7)	0
quality of social interaction	107 (64.1)	59 (35.3)	1 (0.6)

Table 3: Relationship between Functional Status and FertiQoL

Parameters of Functional Status	R	p-value	N
BADL			
Total FertiQol Score	0.128	0.100	167
Core FertiQoL	0.227**	0.003	167
Total Treatment Score	0.038	0.252	167
			134
Intermediate Activities of daily living			
Total FertiQol Score	0.038	0.625	167
Core FertiQoL	0.175*	0.024	167
Total Treatment Score	0.023	0.771	167
			134
Mental Health			
Total FertiQol Score	0.225**	0.004	167
Core FertiQoL	0.616**	0.000	167
Total Treatment Score	0.068	0.380	167
			134
Work Performance			
Total FertiQol Score	0.140	0.087	150
Core FertiQol	0.103	0.212	150
Total Treatment Score	0.152	0.063	150
			134
Social Activity			
Total FertiQol Score	0.194*	0.012	167
Core FertiQol	0.187*	0.015	167
Total Treatment Score	0.168*	0.030	167
			134
Quality of Social Interaction			
Total FertiQol Score	0.312**	0.000	166
Core FertiQoL	0.539**	0.000	166
Total Treatment Score	00.222**	0.004	166
			134

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 4: Influence of functional status on Core Fertiqol

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	77.264	14.362		5.380	.000
	participants age	-1.018	0.280	-0.265	-3.634	.000
	marital status	-2.238	1.021	-0.161	-2.191	.030
	level of education	2.513	1.088	1.187	2.309	.023
	monthly income	1.539	1.231	0.102	1.250	.214
	religion	-5.803	3.123	-0.131	-1.858	.065
	have you been pregnant before?	-3.521	2.856	-.090	-1.233	.220
	ADL2	1.191	3.857	0.025	0.309	.758
	Intermediate activities of daily living	-1.900	4.132	-0.039	-0.460	.646
	Mental Health	10.738	3.093	0.275	3.471	.001
	Work performance	-1.269	2.664	-0.036	-0.476	.635
	Social Activities	1.161	2.838	0.031	0.409	.683
	Quality of interactions	8.672	3.027	0.234	2.865	.005

Model 1 Summary: $R^2 = .437$, $F_{(12, 125)} = 8.081$, $p = .000$

Dependent Variable: Core FertiQoL Criterion level: 0.0

Table 5: Influence of functional status on Treatment Fertiqol

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	22.421	30.327		.739	.461
	participants age	-.566	.592	-.088	-.956	.341
	marital status	1.971	2.157	.085	.914	.362
	level of education	-.097	2.298	-.004	-.042	.966
	monthly income	3.264	2.600	.129	1.255	.212
	religion	5.329	6.595	.072	.808	.421
	have you been pregnant before?	-1.099	6.030	-.017	-.182	.856
	ADL2	6.150	8.145	.077	.755	.452
	Intermediate activities of daily living	-2.936	8.724	-.036	-.337	.737
	Mental Health	-3.088	6.532	-.047	-.473	.637
	Work performance	7.319	5.626	.123	1.301	.196
	Social Activities	4.377	5.992	.070	.731	.466
	Quality of interactions	9.610	6.393	.155	1.503	.135

Model Summary: R^2 = .101, $F_{(12, 125)}$ = 1.165, p =.315

Dependent Variable: Treatment FertiQoL Criterion level: 0.05

Table 6: Influence on functional Status on Total Fertiqol

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	37.117	28.961		1.282	.202
	participants age	-.884	.565	-.141	-1.564	.120
	marital status	.019	2.060	.001	.009	.993
	level of education	2.006	2.195	.091	.914	.363
	monthly income	3.235	2.483	.131	1.303	.195
	religion	-2.158	6.298	-.030	-.343	.732
	have you been pregnant before?	.022	5.759	.000	.004	.997
	ADL2	6.948	7.778	.089	.893	.373
	Intermediate activities of daily living	-5.761	8.331	-.072	-.692	.491
	Mental Health	2.509	6.238	.039	.402	.688
	Work performance	4.408	5.373	.076	.821	.413
	Social Activities	5.025	5.722	.082	.878	.382
	Quality of interactions	8.824	6.105	.146	1.445	.151

Model Summary: R^2 =.142, $F_{(12, 125)}$ = 1.726, p = .069

Dependent Variable: Total FertiQoL Criterion level: 0.05

(Independent variables) were Socio-demographic characteristics and Functional status. Both dependent and independent variables were measured on an interval scale.

Influence of demographics and functional status on Core FertiQol

The core areas of the fertility-related quality of life [Core FertiQoL] are the average fertility quality of life across the areas of emotional, mind-body, relational, and social areas of the woman's infertility. The demographic characteristics and functional status were fed into the model. The regression analysis indicated that the demographic characteristics and functional status of the women collectively explained approximately 44% of the variance in the women's core areas of fertility-related quality of life [Core FertiQoL] (R^2 = .437, $F_{(12, 125)}$ = 8.081, p = 0.000). Individual evaluation of the predictors showed that age (p = 0.000), marital status (p = 0.030), level of education p = (0.023), mental health p = (0.001) and quality of social interaction p = (0.005) statistically significantly contributed to the model. These results suggest that the actual predictors of the core component of fertility-related quality of life were

age, marital status, level of education, mental health, and quality of social interactions. Details of these findings are presented in Table 4.

Influence of demographics and functional status on Treatment FertiQoL

The treatment fertility-related quality of life (Treatment FertiQoL) looks at the treatment environment and tolerability. Multiple linear regression was used to determine if demographic characteristics (independent variable) and functional status (independent variable) predicted treatment FertiQol (dependent variable). Both dependent variables and independent variables were measured on an interval scale. Both demographic characteristics and the six (6) parameters of functional status were examined to ascertain if they significantly predicted the treatment of FertiQol. The results indicated that demographic characteristics and functional status collectively explained 10.1% of the variance in the women's Treatment FertiQoL ($R^2 = 0.101$, $F_{(12, 125)} = 1.165$, $p = 0.315$). None of the predictors contributed significantly to the model when they were individually evaluated. Details of these findings are presented in Table 5.

Influence of demographics and functional Status on Total Fertiqol

A multiple linear regression analysis was performed to determine the influence of the demographic characteristics (independent variable) and functional status (independent variable) on Total FertiQoL (dependent variable) among the women. Total FertiQoL is the average quality of life for all Core and Treatment domains of FertiQoL. The demographic characteristics and the six parameters of functional status were fed into the model. The results indicated that only 14.2% of the variance in Total FertiQoL was explained by the demographic characteristics and functional status ($R^2 = .142$, $F_{(12, 125)} = 1.726$, $p = 0.069$). When the predictors (demographic characteristics and functional status) were evaluated for their individual contribution to the model, none of them were found to significantly predict the Total fertility QOL of the women. This suggests that the predictors (demographic characteristics and functional status) do not determine the average quality of life for all Core and Treatment domains of the fertility-related quality of life of the women. Details of the findings are presented in table 6.

DISCUSSION

Less than half of the women in this study (46.7 %, n = 78) reported that they had good health, suggesting that the majority had poor health, which is similar to what has been reported in a previous study [25]. However, it is worth noting that the poor health status of these women was reported to be more related to their mental health than physical. Therefore, it makes sense that this finding is reflected in most of the women in the current study being able in the ability of the majority of women in this study being able to perform basic and intermediate activities of

daily living. Even though a greater number of the women in this study (65.3%, n = 109) had secondary infertility, findings depict that 32.9% (n = 55) were neither satisfied nor dissatisfied with their QoL. This is contrary to previous research, which reported that women with long duration of primary infertility have impaired HRQoL [26]. Generally, the findings of this study suggest that the women had impaired QoL regardless of the type of infertility. The ambivalence of the women in the present study may be attributed to their secondary infertility status, which seems to suggest that once they have been pregnant before, there is hope for another successful pregnancy. With regard to satisfaction with sexual relationships, the findings were not pleasant. Of the 165 women who responded to this question, only 27.5% (n = 46) could testify to sexual satisfaction. Although sexual intercourse is a necessity for pregnancy to occur, 11.4 % of the women in this study had had no sexual relationship within one month, which could be influenced by the services of artificial insemination provided at two of the facilities included in this study. Also, 20.4% of the participants were dissatisfied with their sexual relations. The findings of this study suggest that the sexual health of couples with infertility is usually strained because these couples are reported to have sexual intercourse that they hardly enjoy [27,28]. This finding agrees with previous literature indicating that infertility negatively impacts the sexual satisfaction of the woman [27]. Sexual function is an important component of health and overall QoL, and it is also a basic physiological need. Thus, women with infertility will indeed be dissatisfied with life if sexual functions are distorted. Furthermore, the results showed that most of the women, 80.2% (n = 134) and 81.4% (n = 136), respectively, could perform both basic activities and intermediate activities of daily living with no difficulty. This implies that infertility does not have much impact on the basic and intermediate activities of daily living. Most participants were seen at outpatient clinics, and many of them looked physically strong. However, findings showed that most of the women in this study (69.5%, n = 116) were in the warning zone for mental illness. This means that the women felt downhearted, nervous, and were not happy. The stressors associated with infertility can cause significant disruption in one's life, related to increased psychological distress, especially in women [29]. The women in this study were at risk of mental health problems probably because they could not tell what the future holds for them. Again, the present study unveiled that almost half of the women (47.3%, n = 79) were unable to work for regular hours, perform normal duties regularly, and or do their jobs as carefully and accurately as others with similar jobs. Certainly, a woman who is nervous and not at peace with herself will find it difficult to perform normal duties. Also, the stress of frequent visits to the hospital is enough to affect her work performance. This agrees with the findings of [30], who purported that infertility decreases the occupational role of women. Some women may even find it a challenge to seek permission to attend fertility clinics, which may add to their stress levels, ultimately affecting their work

performance. This brings about job insecurity (regardless of the type of work), and her QoL suffers. Findings also showed that most of the women (64.7%, n = 108) in this study could visit friends and relatives and attend social gatherings like church and funerals. This contradicts the findings of researchers who purported that women with infertility have difficulty relating to God [21]. However, this study noted that the quality of social interaction of 64.1% (n = 107) of these women was in the warning zone, suggesting that the women hardly act affectionately towards others and or get along well with other people, which is not different from previous research [32,33]. These feelings of anger and worthlessness led to resentment, which possibly caused the women in the present study to be mean-spirited towards friends and relatives, especially those with children. These feelings affected the quality of social interaction of the women. The inability to have good quality social interaction certainly has a negative effect on the women's QoL, and this, in effect, affects their health. The study found positive significant correlations between the various domains of functional status and those of the FertiQol. These suggest that an improvement in women's mental health will lead to an increase in the core areas of fertility-related QoL (social, emotional, mind/body, and relational). Again, an increase in the women's quality of social interaction led to an improvement in their fertility-related QoL, suggesting the importance of good social interactions in the management of infertility. The findings revealed that demographic characteristics and functional status of the women in the study jointly explained 43.7% of the variance in the women's core areas of fertility-related quality of life (R2 = 0.437, F (12, 125) = 8.081, p < 0.001). An individual evaluation of the variables detected that age, educational level, marital status, mental health, and quality of social interaction (aspects of functional status) were significant predictors of the core areas of fertility-related quality of life. This finding resonates with a study conducted in Asia that found a positive correlation between Core FertiQol, age, and education [32]. The influence of age on Core FertiQoL was -1.018 (p < 0.001). This implies that each increase in age of a woman with infertility results in a reduction of -1.018 of her Core FertiQol value. Age is an important determinant of infertility. Advancing maternal age comes not only with the risk of natural and assisted pregnancy but also with the likelihood of poor outcomes of the pregnancy [35,36]. The current study reported a mean age of 34.4 years. This agrees with researchers who noted that women of higher age were seen to be in the infertile group than women of younger age [37]. As the chance of becoming pregnant reduces with age, the women are more likely to be experiencing fear and hopelessness. The fear and hopelessness might affect their functional status, which will have an effect on their health-related quality of life. The coefficient of marital status was -2.669 (p = 0.012), suggesting that a unit change in marital status is expected to result in a reduction of 2.669 in the Core FertiQoL value. This implies that the more married women have fertility problems, the lesser their core areas of fertility QoL. Married women who have infertility are less likely to

relate well in their emotional, mind-body, relational, and social domains. Meanwhile, Karabulut et al. in Turkey found better outcomes for emotional, mind-body, relational, and social domains [38]. The contradiction in findings could be due to the differences in the context of the studies. Although many studies have identified factors that positively or negatively influence the QoL of women with infertility, much has not been identified about the women's influence of functional status on their QoL, especially in Ghana. Out of the six domains of functional status, the women's mental health and quality of social interaction contributed 27.5% and 23.4%, respectively, to the predictive power of Core FertiQol scores (the core areas of fertility-related quality of life). A significant correlation (p = 0.001 and 0.005) was observed between Core FertiQoL and mental health as well as the quality of social interaction, respectively. This relationship suggests that an improvement in mental health and quality of social interaction of women with infertility is likely to improve the Core FertiQol of such women. This finding is supported by evidence from Dourou et al., who discovered a positive association between mental health and mind-body, emotional and relational subscales of the Core FertiQol [39].

In summary, these findings indicate that with regard to the functional status, the women could perform their activities of daily living and social activities. However, their mental health, work performance, and quality of social interactions were affected by infertility. The findings suggest that to improve the QoL of women with infertility, their quality of social interaction, mental health, and work performance should be considered in general care.

Conclusion

Many studies have investigated the QoL of women with infertility, but none was found on the individual components of functional status that could affect their QoL. Any care that includes these facets of women's functional status (mental health, quality of social interaction, and work performance) may improve their general health and overall QoL. If, for some reason, women with infertility decide not to interact socially with people around them and perform badly at their jobs, findings from the present study show that such reactions will affect the core areas of their fertility-related QoL. Therefore, there is a need to improve the mental health, work performance, and quality of social interactions among women with infertility because these aspects are relevant components of their QoL. This study lacks the ability to ascertain a comparison of the women's health-related quality of life with women without infertility. This would have given a better description of the influence of infertility on the mental health outcomes of women.

DECLARATIONS

Ethical considerations

Ethical clearance was sought from the Noguchi Memorial Institute for Medical Research (IRB 00001276). Permission was sought from the health facilities to recruit participants

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