Original Article

Marital Duration, and Fertility-Related Stress as Predictors of Quality of life: Gender Differences among Primary Infertile Couples

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ABSTRACT

Context: Infertility is a global public health issue, and the current data suggest that the problem is growing. Various infertility-related issues are responsible for poorer mental health and well-being in couples with primary infertility. **Aim:** The present study aimed to understand the gender differences of psychological factors related to infertility in couples with primary infertility. Furthermore, an attempt was also made to understand gender-specific associations that could interact with the fertility-related quality of life (FertiQoL). **Settings and Design:** This cross-sectional hospital-based study included 100 married couples with the diagnosis of primary infertility, irrespective of the cause of infertility. The study was conducted at Infertility centers in the Eastern region of India. **Subject and Methods:** One hundred men and women ($n = 100$ couples) with the diagnosis of primary infertility were recruited in the study. The fertility problem inventory and FertiQoL were used to measure the couples fertility-related stress and FertiQoL, respectively. **Statistical Analysis Used:** Descriptive statistics, independent t-statistics, Pearson correlation, linear regression, and mediation analysis were conducted. **Results:** A significantly higher social and sexual concern of infertility and "need for parenthood" were found in women. Men had a significantly better quality of life compared to women. Significant negative predictors of quality of life were noted for both men and women separately. Fertility stress was a significant mediating factor between marital duration and global FertiQoL in men. However, women showed a direct negative association between marital duration and FertiQoL. **Conclusions:** The study provides important insights into the couple's experiences with various infertility problems that may potentially be addressed during psychotherapy or during infertility counseling.

KEYWORDS: *Couples, infertility stress, primary infertility, quality of life*

INTRODUCTION

The World Health Organization (WHO) defines infertility as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse."[1] Infertility is a global public health issue and the current data suggest that the problem is growing in the world. Population-based studies from industrialized countries depict the lifetime prevalence of infertility as 17%–26%.[2] However, only about half of infertile couples seek medical help. Infertility is subclassified into primary and secondary infertility; the former refers to a couple that has never been able to conceive, the latter has had at least one prior successful conception.[3] The WHO estimates the overall prevalence

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of primary infertility in India to be between 3.9% and 16.8%.[4] The prevalence of primary infertility in India has been shown to vary across states and importantly even vary across tribes and castes within the same region. The National Family Health Survey-2 (NFHS-2) estimated that 3.8% of women between the ages of 40 and 44 years have not had any children.[5] According to NFHS-3, 2% of currently married women aged 45–49 have never given birth.[6,7] Furthermore, eastern and central regions of India also depict comparatively high infertility rates, i.e. 2.12% and 1.97% in NFHS 2 and 1.65% and 1.67% in NFHS-3, respectively. For many couples, infertility is a cause of significant psychosocial distress and leads to a poor quality of life. Compared with men, women experience lower self-esteem, depressed mood, and poor life satisfaction.[8] Women also blame themselves for their infertility irrespective of the actual reason for infertility and are more likely to regard childlessness as something that is unacceptable by society. Medical, surgical, and *in vitro* fertilization (IVF) treatments may also pose a great amount of psychological and economic burden. Western data suggested significantly higher levels of anxiety and depressive symptoms, poorer marital functioning, and higher levels of miscommunication and dissatisfaction with their sexual relationships following IVF treatment.[9] This is usually encountered at the start of IVF treatment to 6 months after either becoming pregnant or having completed three cycles without pregnancy.

The fertility-related quality of life (FertiQoL) seemed to be affected in females more than males. Infertility status creates psychosocial stress, reduction of life satisfaction, increase of marital conflict, and decrease of sexual and marital satisfaction that ultimately affect overall satisfaction and quality of life.[10] Monga *et al.*[11] evaluated the hypothesis that infertility may result in a decrease in quality of life and an increase in marital discord and sexual dysfunction. Women in infertile couples reported poor marital adjustment and quality of life compared with controls. Men experience less intercourse satisfaction, perhaps because of the psychological pressure to try to conceive or because of the forced timing of intercourse around the woman's ovulatory cycle.[11] Many individuals and couples report less enjoyment of sexual intimacy as they go through treatment due to the association of sexual intimacy with the failure to get pregnant and not sexual pleasure.[12] The quality of life in women also gets affected due to family pressure to get pregnant or fear of being stigmatized in society.

Seemingly, a plethora of psychosocial factors may be associated with the quality of life in infertile couples and the factors may play differently in men and women independently, despite sharing a common psychosocial milieu when it comes to couples. The present study aims to assess gender differences in infertility-related stress and FertiQoL in primary infertile couples. The purpose was also to understand predictors and mediators that may interact with FertiQoL.

SUBJECT AND METHODS

This was a hospital-based cross-sectional study and used purposive sampling technique. The study was conducted at various infertility centers and gynecology clinics in Ranchi, Jharkhand after taking written consent from the respective clinicians. The study consisted of 100 primary infertile couples, 100 men and 100 women who were recruited for the study. A priori power analysis was conducted with a given alpha power of 0.8 and effect size of 0.4.[13] For a critical t value of 1.97, a total sample of 180 (df = 178) was found. Hence, the study recruited 100 married couples (*n* = 200). Couples with the diagnosis of primary infertility by a gynecologist, according to the WHO,[1] age ranges 21–49 years for men and 18–45 years for women, married for at least 2 years (sexually active and noncontracepting), those who gave informed consent were included for the study. Couples with a history of previous viable pregnancy and a history of any comorbid medical/surgical disease(s) other than those related to infertility were excluded. The protocol for the research project was approved by the Ethics Committee of the Ranchi University (B/1097/16), and it is conformed to the provisions of the Declaration of Helsinki.

Tools

Sociodemographic and clinical data sheet

The researcher prepared the sociodemographic questionnaire for data collection. This data sheet assessed information related to the participant's age, educational background, family income, religion, domicile, employment status, marital duration, and family type. Along with this, the clinical data sheet included information related to causes of infertility, duration of infertility, whether participants have pursued any infertility treatment and if so, types of treatment, duration, and cost of treatment.

Fertility problem inventory

Developed by Newton *et al.*,[14] the inventory captures perceived stress specifically to populations experiencing infertility. It consists of 46 items and five subscales, i.e. social concern, sexual concern, relationship concern, need for parenthood, and rejection of a child-free lifestyle. Together, all five areas contribute to global

infertility stress. Fertility problem inventory has a Cronbach alpha of 0.92 for women with primary infertility and of 0.91 for women with secondary infertility. Two bilingual experts translated the inventory into Hindi, and the final version was used in the study. The translation was done in accordance with the guidelines provided by the WHO.[15]

Fertility Quality of Life Questionnaire International

The FertiQoL: The scale was developed by Boivin *et al*.,[16] a disease-specific QoL scale developed for measuring fertility problems in men and women with infertility. It consists of 36 items and two modules, the core, and treatment sections. The core FertiQoL items consists of 24 items covering four subscales: mind and body, relational, social, and emotional domains. The FertiQoL treatment module, consisting of 10 items and two subscales: environment and tolerability. The FertiQoL yields six subscales with a range of 0–100 and a higher score on any subscale means a better QoL. The Hindi version of FertiQoL International (available from http://sites.cardiff.ac.uk/fertiqol/) was used in the present study.

Statistical analysis

This study was analyzed using quantitative statistical methods. Categorical variables were compared using Pearson's Chi-square and continuous variables using independent samples *t*-test. Correlation was assessed using Pearson's correlation coefficient and linear regression analysis was used to understand the predictors. Finally, we conducted mediation analysis,[17] using a macro for SPSS (PROCESS v. 3.3, www.processmacro.org). We employed 5000 bootstrapped samples to generate estimates of the indirect effects, standard errors of these estimates, and 95% bias-corrected confidence intervals (CIs) surrounding these effects, which serve as estimates of statistical significance. Null hypothesis was rejected at $P < 0.05$. We used IBM SPSS Statistics, version 24 (IBM Corp., Armonk, NY, USA)for Windows for data analysis.

RESULTS

Sociodemographic characteristics

The study comprised 100 married couples (100 men and 100 women) with the diagnosis of primary infertility. The mean age of men and women was 31.20 ± 4.41 and 27.48 ± 4.21 years, respectively, and were significantly different ($P ≤ 0.001***$). Mean years of education were 13.15 ± 3.39 and 11.72 ± 3.48 in men and women, respectively ($t = 2.94$, $P = 0.004**$). Nearly 58% of couples belonged to the middle socioeconomic status and 23% and 19% of them belonged to either low or high socioeconomic status [Table 1 for detailed sociodemographic characteristics].

Table 1: Sociodemographic characteristics of couples with primary infertility

Variables	Mean±SD	t/χ^2	P
Age (years)			
Men	31.20±4.41	6.09	<0.001***
Women	27.48±4.21		
Marital duration of couples (years)	4.22±2.60		
Years of education			
Men	13.15±3.39	2.94	0.004**
Women	11.72±3.48		
Socioeconomic status (%)			
Low	46 (23)		
Middle	116 (58)		
High	38 (19)		
Religion of couples (%)			
Hindu	158 (79)		
Muslim	31 (15.5)		
Christian	11 (5.5)		
Others	0		
Family type (%)			
Nuclear	65 (32.5)		
Joint	135 (67.5)		
Domicile (%)			
Urban	124 (64)		
Semi-urban	64 (29)		
Rural	12 (07)		
Employed (%)			
Employment status			
Men	90 (90)	85.54	<0.001***
Women	10 (10)		
Unemployed men	10 (10)		
House wife	90 (90)		

***$P<0.0001$, **$P<0.001$. SD=Standard deviation

Clinical characteristics

The mean duration of infertility was 30.14 ± 7.23 months. The mean duration of infertility treatment was 16.55 ± 8.04 months. Family history of infertility was only reported in 1.5% of men and 2% of women samples. Nearly 61.5% of either couple underwent medical treatment. Around 19% had identified surgical causes and underwent surgical treatment, 13.5% underwent combined treatment, and 6% of couples underwent IVF. Female cause of infertility was noted in 43%, male factor-related infertility 18%, whereas combined and unknown causes were reported in 24% and 15%, respectively.

Fertility problem: Gender differences

Fertility-related problems were compared between male and female genders. Women had significantly higher social ($P = 0.01*$) and sexual concerns as compared to men ($P = 0.04*$). Women had significantly higher need for parenthood ($P = 0.04*$) and global stress as compared to men ($P = 0.01*$). The rest of the subscales were statistically nonsignificant [Table 2].

Fertility-related quality of life: Gender differences

Men had significantly better quality of life on all the domains of FertiQoL in emotional ($P < 0.001***$), mind-body ($P < 0.001***$), relational ($P = 0.045*$), social ($P = 0.014*$), and tolerability ($P = 0.005**$). The core FertiQoL ($P < 0.001***$) and treatment FertiQoL ($P = 0.004**$) scores, respectively, were also significantly higher in men as compared to women. Finally, the total FertiQoL was also significantly higher in men ($P < 0.001***$) as compared to women. The environmental domain, however, was nonsignificant between the groups [Table 3].

Predictors of fertility related to quality of life

Stepwise, multiple regression analysis was performed to better understand the association between independent variables and dependent variables. For each analysis, the predictor variables and outcome variables (core FertiQoL and treatment FertiQoL separately) were entered into a regression model after stratifying for male and female gender. The results from the linear regression analysis are shown in Table 4. In women, the results of the analysis using core FertiQoL as dependent variable, which revealed 11.4% variance for marital duration ($P = 0.001**$) and 36.8% variance for relationship concern ($P < 0.001***$). However, in men, there was 14.5% variance for marital duration ($P < 0.001***$), 48.1% variance for sexual concern ($P < 0.001***$), and 11.6% variance for

rejection of childfree lifestyle ($P = 0.001**$). On the other hand, for women, treatment FertiQoL showed 11.5% variance for years of education (F = 12.73, $P = 0.001**$), 29.9% variance for sexual concern ($P < 0.001***$), and 10.5% variance for the cost of infertility treatment ($P = 0.001**$). Finally, in men, for treatment FertiQoL, 6.5% variance was noted for marital duration ($P = 0.01*$) and 27.4% variance for relationship concern ($P < 0.001***$) [Table 4].

Mediation analysis

The final set of analyses examined whether global fertility stress mediates the influence of marital duration on the quality of life. Accordingly, the direct and indirect effects of marital duration on quality of life and infertility stress were assessed. Bootstrapping procedures were done to generate estimates of the indirect effects, standard errors of these estimates, and 95% bias-corrected CIs surrounding these effects based on 5000 bootstrapped samples. The results were interpreted to be significant if the associated CI does not include zero. The results showed that the independent variable (marital duration) and mediator (infertility stress) together explained a significant share of the variance in quality of life ($R^2 = 0.32$, $P < 0.001***$) and marital duration on the quality of life ($R^2 = 0.12$, $P < 0.001***$). Path estimates are shown in Figure 1. There was a significant negative direct effect of the duration of their marriage on their quality of

Table 2: Comparison of fertility related problems between male and female genders with primary infertility

Fertility problem (*n*=200)	Mean±SD		*t* (df=2/198)	*P*
	Men (*n*=100)	Women (*n*=100)		
Social concerns	28.25±7.37	30.87±7.93	2.42	0.01*
Sexual concerns	26.14±12.43	27.75±11.40	2.002	0.04*
Relationship concerns	27.97±10.30	29.08±10.35	0.76	0.45 (NS)
Rejection of child-free lifestyle	35.11±10.20	36.84±10.54	2.54	0.32 (NS)
Need for parenthood	40.64±10.25	43.95±12.88	2.01	0.04*
Global stress	156.11±34.20	168.49±35.97	2.49	0.01*

P<0.05. SD=Standard deviation, NS=Nonsignificant

Table 3: Comparison of fertility-related quality of life between male and female genders with primary infertility

Quality of life (*n*=200)	Mean±SD		*t* (df=2/198)	*P*
	Men	Women		
Emotional	59.38±20.54	48.16±21.86	−3.74	<0.001***
Mind-body	64.75±23.01	52.42±25.22	−3.61	<0.001***
Relational	64.17±22.38	57.46±24.63	−2.02	0.045*
Social	63.71±22.27	55.33±25.34	−2.48	0.014*
Environmental	57.50±18.84	52.08±21.36	−1.90	0.059 (NS)
Tolerability	70.38±24.06	60.13±26.36	−2.87	0.005**
Core FertiQoL	62.76±18.19	52.68±20.78	−3.65	<0.001***
Treatment FertiQoL	63.86±17.49	55.85±20.87	−2.94	0.004**
Total FertiQoL	63.31±16.12	54.26±19.40	−3.59	<0.001***

P<0.05, **P*<0.01, ***P*<0.001. SD=Standard deviation, NS=Nonsignificant, FertiQoL=Fertility-related quality of life

life (estimate = −1.08*, *P* < 0.05*, 95% CI − 2.48–0.32). There was a significant negative indirect effect of duration of marriage on the outcome variables (estimate = −1.02*, *P* < 0.05*, 95% CI − 2.24–0.20) [Table 5]. Path analysis shows that infertility stress plays a role of potential mediator relationship between marital duration and quality of life [Figure 1].

DISCUSSION

Infertility stress: Gender differences

The current study found significantly higher social concerns in women compared to men with primary infertility. Accordingly, social concerns, including sensitivity to comments or criticisms, reminders or preoccupations of infertility, feelings of social isolation, feelings of alienation, or ostracism from family or peers.[14] It is generally the childless women who take the brunt/blame of negative comment related to infertility. They may tend to feel more socially alienated

or ostracized because of the social pressure to become pregnant which makes them preoccupied with treatment and failure of treatment.[18] Women also had significantly higher sexual concerns, i.e. diminished sexual enjoyment or sexual self-esteem than men. Although both partners experienced sexual concern as sexual relationships become no longer an intimate act, but is a reason to become pregnant. Hence, the routine nature and task orientation of the act can create a great deal of pressure and frustration among couples.[19] A study also found that sexual dissatisfaction was stronger for wives than husbands, whereas its impact on frequency of intercourse was stronger for husbands.[20] The present study found a higher need for parenthood in women as they feel their life satisfaction or happiness are solely dependent on having a child. Contrary to this, studies have also found that rejection of childfree lifestyle and need for parenthood were more associated with men.[21,22] The discrepancy may be due to the different sample sizes or the settings in which the data collection was done. It is not surprising that global assessments of fertility-related stress are significantly higher in women. Medical or surgical treatment may have a negative psychological impact on women and place them at a greater risk for stress and depression, due to which some may even drop out from the treatment.[22]

Fertility quality of life: Gender differences

The present study found significantly better quality of life in men in the domains of emotional, social, relational, tolerability, and global quality of life. A study

Table 4: Regression coefficients and interactions for core and treatment fertility-related quality of life classified by gender, derived from multivariable models

a. Predictors of core FertiQoL

Predictors	Standardized (β coefficient)	*t*	*P*
Females			
Marital duration	−0.34	−3.54	0.001**
Relationship concern	−0.62	−7.84	<0.001***
Males			
Marital duration	−0.38	−4.08	<0.001***
Sexual concern	−0.69	−9.52	<0.001***
Rejection of childfree lifestyle	−0.34	−3.59	0.001*

b. Predictors of treatment FertiQoL

Females			
Education (years)	0.34	3.57	0.001*
Sexual concern	−0.55	−6.47	<0.001***
Cost of treatment	−0.32	−3.39	0.001**
Males			
Marital duration	−0.25	−2.62	0.01*
Relationship concerns	−0.52	−6.08	<0.001***

P<0.05, **P*<0.01, ***P*<0.001. FertiQoL=Fertility-related quality of life
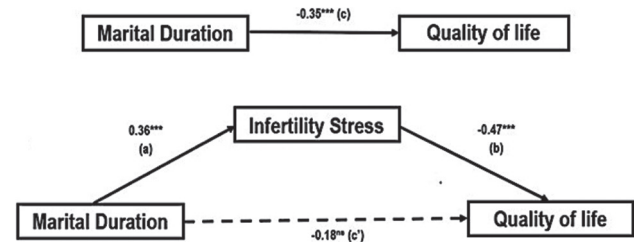

Figure 1: Mediation model showing the effect of marital duration on quality of life. (a) Association of marital duration with quality of life in males. (b) After adjusting for the effect of infertility stress (*n*-=100)

Table 5: Mediation model showing direct and indirect effect of marital duration on fertility of life in males (*n*=100)

From → to	Path coefficient (standardized)		Indirect effects	
	Infertility stress	Quality of life	Estimates	95% CI (low-high)
Marital duration	0.36***	−0.18 (NS)		
Infertility stress		−0.47***		
Total indirect effect				
(Indirect effect) marital duration → infertility stress → quality of life			−1.02*	−2.24-−0.20
(Direct effect) marital duration → quality of life			−1.08*	−2.48-0.32
(Total effect) marital duration → quality of life			−2.10***	−3.57-−0.63

P<0.05, ***P*<0.001. NS=Nonsignificant, CI=Confidence interval

from India also reported that male partners had a better quality of life than infertile female partners.[23] Interestingly, anxiety and depression levels in infertile women were equivalent to those found in individuals with heart disease or cancer, or to those who had been diagnosed with the human immunodeficiency virus positive and had a significantly poor quality of life.[24] It may be hypothesized that women with high levels of irrational parenthood cognition are at risk of less optimal quality of life. Another explanation could be women are blamed (or sometimes they take the blame) more frequently for the couples' infertility and thus, the stigma associated with such blaming (regardless of the diagnosis) causes more distress.[25]

Causal model: Marital duration, infertility stress, and quality of life

Marital duration and relationship concerns were significant negative predictors of core FertiQoL. Tao *et al.*[26] suggested that infertile women may have significantly less satisfactory marital relationships compared to fertile women. Similarly, marital duration, sexual concern, and rejection of childfree lifestyle negatively predict core fertility in men. Reduced sexual satisfaction, task-based sexual performance, and secrecy related to diagnosis in the society and rejection of child-free lifestyles may affect men equally due to the underlying stigma related to infertility.[27] However, factors such as sexual concern and cost of treatment were significant negative predictors. Women perceive sexual activity as a part of the treatment process rather than intimate contact. Nonetheless, the cost of the treatment bears a significantly higher role that affects the individual psychologically and financially. Marital duration and relationship concerns may interact negatively with respect to treatment FertiQoL impacting to poor QoL. Men with infertility experience a significantly poorer quality of life compared to men without infertility and are prone to develop depression, dysthymia, and anxiety.[28] Interestingly, we found higher educational status to be a significant positive predictor of treatment FertiQoL. Infertile women with higher education may have more social resources to deal with infertility-related stress and can protect themselves from mental health problems.[28,29]

Infertility stress as a mediator

Our findings suggest that global infertility stress can be a significant mediator between marital duration and overall quality of life in men [Figure 1]. With increased marital duration, there is an increasing social concern and stigma related to childlessness. Furthermore, sexual dissatisfaction may also further worsen an individual's well-being. The social status of men is compromised

due to the childlessness. As an obstacle to achieving life goal of parenthood, the inability to conceive a child often triggers psychological distress, decreased sexual pleasure, and sensitivity to comments from family members and friends.[29] These factors may overall contribute to a poor quality of life not only in women but also in men which is an important finding of our study. Our finding indirectly hints that, by reducing infertility stress, one may indirectly improve the overall quality of life despite spending many childless years. However, this indirect path was not prominent in women. They experience reduced psychological well-being with increasing duration of marriage. This suggests a direct negative association between increasing marital duration and poorer life satisfaction among women.

CONCLUSION, LIMITATION AND FUTURE DIRECTION

Despite sharing the same psychosocial milieu, there is a stark difference in the perception of infertility between men and women in various domains. Infertile women experience negative psychological consequences more commonly than men. Health professionals working with infertile couples are encouraged to assess and mitigate infertility stress using various strategies with their clients as a part of holistic infertility treatment and care. This, in turn, can reduce the overall burden related to the course of the treatment. Limitations include the possibility of selection bias, region-specific findings, and cross-sectional nature of the study. Future studies may incorporate our study finding as a part of routine infertility counseling and longitudinally assessed with respect to fertility outcomes.

Conflicts of interest

There are no conflicts of interest.

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