

A Cross Sectional Observation Study to Assess Stress by Measuring Fertility Quality of Life in Couples Experiencing Primary Infertility

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Abstract: To assess infertility related stress by measuring fertility quality of life in couples experiencing primary infertility using FertiQoL questionnaire. To identify whether there is any significant difference in the stress level and quality of life between males and females experiencing primary infertility. A crosssectional observation study conducted at G. Kuppuswamy Naidu Memorial Hospital, Coimbatore during the period of June 2016 to June 2017 in 100 couples experiencing primary infertility in the age group of 25 to 40 years using FertiQoL questionnaire. All the scores summarised using mean and standard deviation and comparison between male and female patients done using independent samples t - test. In our study both men and women score less in emotional, mind /body and social subscales of which women score less than men. Relational subscale scores were better in both men and women when compared to rest of the subscales. Treatment tolerability is poor than treatment environment in both men and women. Overall FertiQoL is less in both men and women of which women are more negatively affected. Inspite of medical and surgical management of infertility these patients should be given routine counselling and support to improve their fertility quality of life and to decrease their stress level related to infertility.

Keywords: Infertility, stress, FertiQoL, domains, score

1. Introduction

Infertility is defined as inability to conceive after a period of 12 months of regular unprotected intercourse. According to WHO overall prevalence of primary infertility in India ranges between 3.9 to 16.8%. Rough estimates suggest that nearly 30 million couples in the country suffer from infertility making the incidence rate of infertile couples at 10% which keeps on increasing.

The relationship between infertility, emotional distress and fertility quality of life has been studied by several authors. The experience of infertility causes profound emotional distress on the individual and the couples according to their studies and underline that this condition is a constant source of psychological and social stress.

The aim of the study is to identify individuals and couples with significantly lower fertility quality of life and higher levels of infertility related stress. Thus identifying them will help in improving their quality of life and decreasing their stress level by appropriate measures like psychosocial counselling.

2. Review of Literature

In 1997 Greil published a review and critique on the socio psychological impact of infertility (1) . He found that more equivocal results were produced when attempted to test the psychological consequences hypothesis, while descriptive literature showed infertility as a devastating experience. When measured stress and self esteem there was significant difference but when psychopathology was studied there was no significant difference between infertile population and

others. He also concluded that infertility is a different experience for women than men.

Psychological studies demonstrate a higher incidence of negative reaction to infertility and its treatment. According to a study by Verhaak et al 2007 (2) most men and women adjust well to unsuccessful IVF treatments. But there are women who develop significant levels of stress after unsuccessful IVF treatment. According to the study psychosocial intervention should be done in these women to help them in treatment failure.

Dancet et al 2010 (3) conducted a study regarding patients perspective on fertility care. They found that infertile patients wanted them to be treated like human beings. They also expected partner involvement in the treatment process. They expected good attitude of fertility clinic staff and a good relationship with them. Inspite of medical skills they also needed comfort, support, respect and information.

C. D. Lynch, R. Sundaram et al 2014 (4) measured salivary alpha amylase level in infertile women to assess stress level preconceptionally. Higher levels of stress as measured by alpha amylase showed longer time to pregnancy and increased risk of infertility. Johansson et al 2010 (5) conducted a study in Sweden. They compared the quality of life in men and women who underwent IVF treatment 4 to 5.5 years previously, either successful or unsuccessful with men and women who had children by spontaneous conception without any infertility treatment. They did not find any difference between men and women in terms of psychological general well being and sense of coherence in the unsuccessful IVF group. Men showed lower scores in psychological general well being and sense of coherence in the unsuccessful IVF group. Women also reported more

depression, anxiety and lower sense of coherence than the control group. In men quality of life seems to be more negatively affected by involuntary childlessness than reported in earlier studies.

To understand the seriousness of emotional problems, in patients undergoing fertility treatment needs to be studied, as the stigmatising character of infertility prevents patients from talking about their problem. Unsuccessful treatment raises the level of anxiety and depression. Hence psychological aspect of intervention also becomes important for infertile patients in order to improve their mental health, quality of life, to decrease drop outs and possibly to increase pregnancy rates. Infertility increases the risk of suicide in women according to Kjaer et al 2011. (6)

Boivin J et al 2011 (7) done a study on emotional distress in infertile women and failure of ART. The study showed lack of association between pretreatment emotional distress and pregnancy outcome in women undergoing ART. This study confirmed that pretreatment emotional distress does not affect the chances of pregnancy after a single cycle of treatment with ART. It reassures women that emotional distress caused by fertility problems, their treatment and other co occurring life events are unlikely to further reduce the chances of pregnancy.

A preliminary study in a Hungarian population by Reka Eszter Cserepes et al 2013 (8) showed women had more intensive effects than men regarding infertility related global stress, social concerns and general health problems. According to Luc et al 2015 (9), infertility affected couples in the following four aspects - psychological well being, quality of life, social and marital relationships. There was negative effect on the psychological well being and sexual relationships in infertile couples. The evidence is inconclusive on marital relationships and quality of life.

Herrmann et al 2011 (10) conducted a study about resilience in infertile couples (resilience=psychosocial stress resistance). High resilience in infertile couples showed high levels of psychosocial stability. A high resilience correlated with high quality of life in men on all domains of WHO quality of life. It also correlated with low infertility specific distress in women on all scales of fertility problem inventory. Hence resilience can be considered as a protective factor for infertile couples against impaired quality of life and infertility specific distress.

FertiQoL questionnaire is a reliable method to know the impact of fertility problems and its treatment on quality of life according to Boivin J et al (11). Study conducted by J. Aarts et al 2011 (12) confirmed the expected negative relation between QoL as measured by FertiQoL questionnaire and anxiety and depression. According to their study FertiQoL questionnaire reliably measures QoL in women experiencing infertility. Hence FertiQoL questionnaire enables clinicians to tailor cases more specifically and in a comprehensive way.

3. Material and Methods

This study was conducted at G. Kuppuswamy Naidu

Memorial Hospital, Coimbatore. Couples attending fertility clinic in the age group of 25 to 40 years experiencing primary infertility was taken as the study population. It is a cross sectional and observational study with a sample size of 100 Infertile couples (total 200 patients).

Sample size calculation:

To test the mean difference of 6† in total core FertiQoL between male and female with pooled standard deviation of 14†, at 85% power and 5% level of significance, sample size of 196 (98 in each group) is required.

Calculation:

$$n = \frac{2(Z_{1-\alpha/2} + Z_{1-\beta})^2 \sigma^2}{(d)^2}$$

Standard normal value for 5% level of significance, Z0.95 = 1.96

Standard normal value for 85% power, Z0.85 = 1.04

Anticipated Mean difference, d = 6

Pooled standard deviation, $\sigma = 14$

$$n = \frac{2(1.96 + 1.04)^2 14^2}{(6)^2} = 98$$

A cross sectional and observational study design. with a sample size of 100 infertile couples. All the couples between the age of 25 to 40 years attending the fertility clinic with primary infertility were included. Couples <25 years and >40 years, those with psychiatric illness and those with secondary infertility were excluded from the study.

By using FertiQoL a self report questionnaire which is specifically designed for infertile patients to assess their quality of life by experts from the European Society of Human Reproduction and Embryology (ESHRE) and the American Society of Reproductive Medicine (ASRM).

2 main modules - Core FertiQoL Module and Optional treatment module.

Core FertiQoL Module has 24 items categorised into 4 domains.

Emotional, cognitive and physical, relational and social domains.

Optional treatment module 2 domains.

Environment and tolerability for the treatment of infertility.

The subscale and total FertiQoL scores are to be computed and transformed to achieve a range of 0 to 100, while higher scores indicate better QoL.

Statistical Methods

All scores to be summarised using mean and standard deviation and the comparison between male and female patients to be done using independent samples t - test. P - value of 0.005 will be considered as statistically significant. The statistical analysis to be done using R Version 3.3.2.

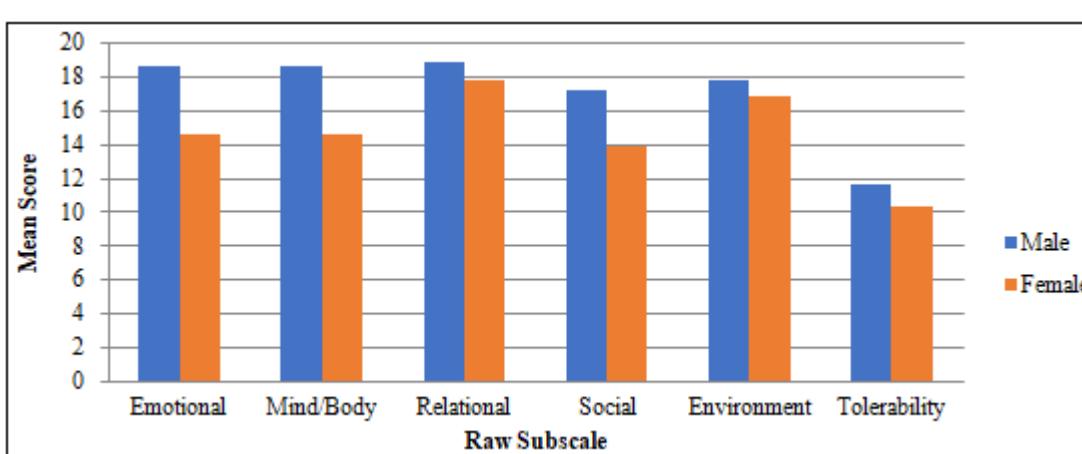
4. Results and Analysis

Table 1: Raw Subscale

Rawsubscale:	Gender	Mean	Std. Deviation	p - value
Emotional	Male	18.64	4.81	<0.001a
	Female	14.59	5.12	
Raw subscale: Mind/body	Gender	Mean	Std. Deviation	p - value
	Male	18.64	4.44	<0.001a
Raw subscale: Relational	Female	14.67	5.53	
	Gender	Mean	Std. Deviation	0.086
Raw subscale: Social	Male	18.87	4.12	
	Female	17.85	4.24	<0.001a
Raw	Gender	Mean	Std. Deviation	p - value
	Male	17.21	4.50	
	Female	13.88	4.58	
	Gender	Mean	Std. Deviation	p - value
	Male	11.61	3.25	0.009a
	Female	10.3	3.70	

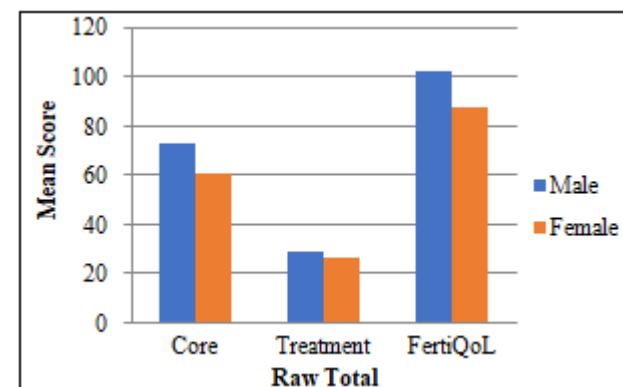
subscale:	Male	17.89	3.64	0.071
Environment	Female	16.87	4.27	
Raw subscale:	Gender	Mean	Std. Deviation	p - value
Tolerability	Male	11.61	3.25	0.009a
	Female	10.3	3.70	

Above tables shows the mean score of Raw subscale for different factors between males and females. It is evident that the mean difference of score between males and females in factors such as Emotional, Mind/Body, Social and Tolerability are statistically significant at 5% level of significance, whereas the factors such as Relational and Environment scores are not different between males and females significantly. All the above comparisons were made using independent samples t - test.

**Figure 1:** Comparing the Raw Subscales of Core and Treatment FertiQoL**Table 2:** Total Raw Score

Total raw core score	Gender	Mean	Std. Deviation	p - value
Total raw core score	Male	73.36	14.44	<0.001a
	Female	60.99	15.11	
Total raw treatment score	Gender	Mean	Std. Deviation	p - value
	Male	29.20	5.91	0.019a
Raw total FertiQoL score	Female	27.23	5.89	
	Gender	Mean	Std. Deviation	p - value
Raw total FertiQoL score	Male	102.56	17.03	<0.001a
	Female	88.22	17.69	

The above tables presents the mean and SD for the raw total score of Core, Treatment and FertiQoL score between male and females respectively. It is clear that the mean difference in raw total, treatment and FertiQoL score between male and female are statistically significant at 5% level of significance. Independent samples t - test was used for testing the above comparisons.

**Figure 2:** Comparing the Total Raw Scores of Core, Treatment and Overall FertiQoL**Table 3:** Scaled Subscale

Scaled subscale:	Gender	Mean	Std. Deviation	p - value
Emotional	Male	78.3	19.71	<0.001a
	Female	61.33	21.28	
Scaled subscale: Mind/body	Gender	Mean	Std. Deviation	p - value
	Male	78.77	17.61	<0.001a
Scaled subscale: Relational	Female	62.12	22.72	
	Gender	Mean	Std. Deviation	p - value
Scaled subscale: Social	Male	80.34	15.79	0.071
	Female	76.02	17.75	
Scaled subscale: Tolerability	Gender	Mean	Std. Deviation	p - value
	Male	72.37	18.14	<0.001a
Scaled subscale: Environment	Female	58.71	19.23	
	Gender	Mean	Std. Deviation	p - value
Scaled subscale: Treatment	Male	76.43	15.48	0.098
	Female	62.12	22.72	

Environment	Female	72.72	16.07	
Scaled subscale:	Gender	Mean	Std. Deviation	p - value
	Male	74.28	19.95	
Tolerability	Female	65.35	22.84	0.004a

It is evident from the above table that the mean score of scaled subscale for different factors between males and females in factors such as Emotional, Mind/Body, Social

and Tolerability are statistically significant at 5% level of significance, whereas the factors such as Relational and Environment scores are not different between males and females significantly. Independent samples t - test was used for assessing the mean difference of scores between male and female

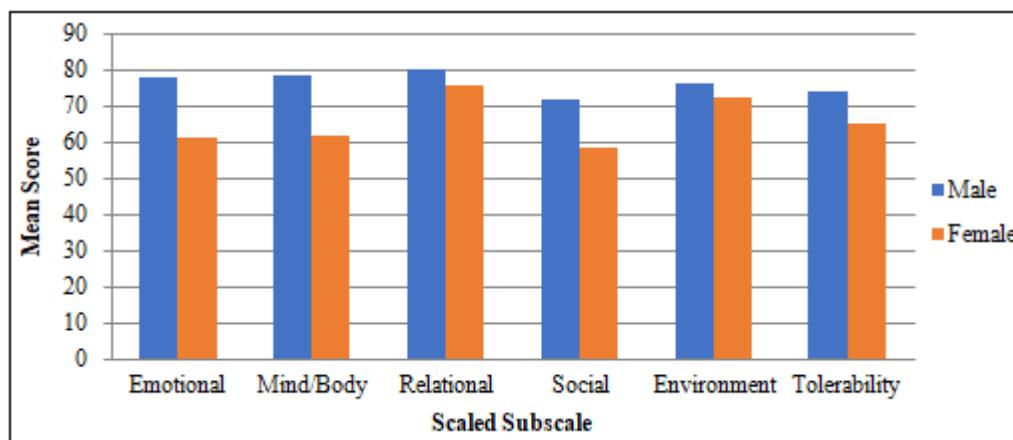


Figure 3: Comparing the Scaled Subscales of Core and Treatment Fertiqol Scores

Table 4: Total Scaled Score

	Gender	Mean	Std. Deviation	p - value
Total scaled core score	Male	77.45	14.18	<0.001a
	Female	64.5	15.74	
Total scaled treatment score	Gender	Mean	Std. Deviation	p - value
	Male	75.71	14.51	
Total scaled FertiQoL score	Female	69.25	14.25	<0.001a
	Gender	Mean	Std. Deviation	
	Male	76.84	12.05	
	Female	66.28	13.35	

The total scores were summarized using mean and standard deviation and the comparison between male and female were done using independent samples t - test. P - value of 0.05 will be considered as statistical significance. From the above table it is clear that there is a significant difference in the scaled core, treatment and FertiQoL scores between male and females.

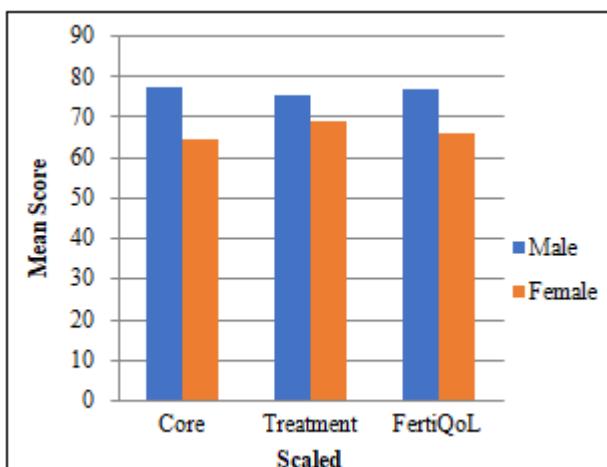


Figure 4: Comparing the Scaled Total Core, Treatment and Overall Fertiqol Scores

5. Discussion

This study was conducted in 100 randomly selected infertile couples who attended fertility clinic in our hospital during the period of June 2016 to June 2017. All couples were experiencing primary infertility. The age group in this study varied from 20 to 45 years with majority in the age group of 30 to 40 years. With respect to their educational status all completed their schoolings and majority of them were graduates.

Their fertility quality of life measured using Fertility Quality of Life Questionnaire (2008). The first internationally validated instrument to measure quality of life in individuals experiencing fertility problems, developed by experts from European Society of Human Reproduction and Embryology (ESHRE) and The American Society of Reproductive Medicine (ASRM). On behalf of our request, Cardiff University translators UK, translated the questionnaire into our regional language Tamil, which helped us to conduct the study in our mother tongue for better understanding of our patients to avoid errors due to misinterpretation of foreign language.

In our study we calculated both raw and scaled scores for Core FertiQoL, Treatment FertiQoL and overall FertiQoL. In which Core FertiQoL is the average quality of life across all domains and the subscales include Emotional, Mind/Body, Relational and Social. The Treatment FertiQoL is the average quality of life across treatment domains which includes Treatment environment and Treatment tolerability.

Raw scores expressQoL in the original unit of measurement whereas scaled scores express on a standard scale with a range from 0 to 100. Scaled scores were used for interpretation and comparison across subscales and other researches. All scores summarised using mean and standard deviation. Comparison between men and women done using

independent sample t - test. The statistical analysis were done using R Version 3.3.2.

The study showed poor total scaled core FertiQoL score in both men and women experiencing primary infertility. When compared between both sexes women scored poor than men in all the domains, as the p value is statistically significant except for relational subscale (p value - 0.071). This means both men and women experience more negative emotions such as sadness, depression, jealousy, resentment in terms of emotional subscale. They have negative impact on their physical and mental health such as fatigue, pain, poor concentration, disrupted daily activities and delayed life plans which is evident from poor mind body subscale score. According to the study women are more negatively affected than men in Emotional, Mind/body and social subscales.

While comparing all the scaled subscales of core and treatment fertility quality of life scores both men and women score higher in relational subscale. The relational subscale shows the impact fertility problems have had on the components of partnership or relationship such as sexuality, commitment and communication. The study showed that there is no difference between men and women in terms of commitment to their relationship or partnership. This aspect shows the strong cultural values of the study population which gives more values for relationship commitments.

Men and women both score less in social domain when compared to rest of the domains, which means infertile couples have more problems in social interactions such as social inclusion, stigma, support, expectations etc, of which women are more affected than men (p value<0.001). A study by Wilson and Kopitzke (13) supported the above statement. According to their study infertile couples feel isolated, neglected and withdraw from family and friends.

Regarding scaled treatment FertiQoL, treatment tolerability is poor in both men and women when compared to treatment environment. There is statistically significant difference in treatment tolerability between men and women (p value - 0.004).

This means infertile couples experience more negative mental and physical symptoms as a result of their fertility treatment which is found to have negative impact on daily life of women who are more affected than men.

According to the study, treatment environment is better than treatment tolerability which means the accessibility and quality of treatment is having less negative impact on quality of life when compared to the physical and mental stress caused by treatment itself. No statistically significant difference was observed regarding treatment environment in both men and women (p value - 0.098). Total scaled treatment FertiQoL score is less in both men and women. Overall women experience more stress and poor quality of life than men regarding fertility treatments.

From the above results it is evident that both men and women are experiencing considerable stress due to infertility and its treatment, of which women are more distressed than men and the quality of life is very poor in women than men.

This is supported by Chachamovich et al (2010) (14) . According to their study women had significantly lower scores in several HRQoL and QoL domains when compared to men. Greil (1) in his review and critique on socio psychological impact of infertility concluded that infertility is a different experience for both men and women and described infertility as a devastating experience.

A study by A. G. Huppelschoten et al (15) showed both men and women are at increased risk of psychological stress and women were found to be more at risk of emotional problems during and after treatment. In our study also we found both men and women are more distressed of which women are more distressed than men. Our study can be compared with the study done by Slade et al (16) which showed women are more distressed and experience more stigma than men. Our study showed both men and women experience more stigma of which women are more affected and they have more difficulty in social interactions. This was also supported by White and Mc Quillan et al (17) .

Wischamann et al (18) showed higher stress and lower levels of life satisfaction in infertile women. Our study also showed women to have lower fertility quality of life and higher level of stress when compared to men. A study by Oddens et al (19) showed more depression and anxiety in infertile women. In our study we also found women were experiencing more negative emotions such as sadness, depression and jealousy.

A study by Peronace et al (20) showed infertility as a stressful experience for men in Denmark. Folkvard et al (21) showed one third of men in Sub Saharan Africa with infertility exhibited mild signs and symptoms of clinical depression. Klemetti et al (22) showed men with infertility experience had significantly poorer quality of life. J. Fischer et al (23) showed infertile men are more prone for severe anxiety. All these studies showed that men are also negatively affected by infertility as women. Similar to the above mentioned studies in our study also we found men are more negatively affected by infertility and they experience negative emotions like depression, sadness, physical and mental symptoms such as pain, fatigue and poor concentration. Men are also affected by social stigma. It is evident from our study that men also experience poor fertility quality of life which is comparable to the above mentioned studies.

6. Conclusion

The present study indicates that men and women with infertility are experiencing significant amount of stress as assessed by the fertility quality of life questionnaire of which women are more affected than men. Social domain is more negatively affected when compared with the rest. This indicates that social interactions are more negatively affected by infertility problems (eg. social inclusion, support, stigma, expectations).

Both men and women score better in relational subscale, which indicates their strong commitment for their relationship or partnership. This also shows that infertility has less negative impact on the sexuality and communication

of partners. Infertile couples experience more negative emotions like jealousy, sadness and depression. Infertility causes negative impact on physical and mental health causing fatigue, pain, poor concentration, disrupted daily activities and delayed life plans. Women experience all these symptoms more than men.

Infertile couples experience more negative mental and physical symptoms as a result of their fertility treatments. Women experience poor treatment tolerability than men. As such accessibility and quality of treatment has less negative impact when compared to treatment tolerability.

7. Recommendations

From the above observation it is evident that both men and women are more negatively affected by infertility and its treatment. Both experience poor fertility quality of life, women more than men. Hence along with infertility treatment they should be provided regular and routine counselling by a trained counsellor to decrease their stress level thereby improving their quality of life. Counselling should be extended to the family members also in order to provide good family support. Social support should be provided by creating support groups. General public awareness should be created to decrease the social stigma and social expectations revolving around infertility which will greatly reduce the burden what the infertile couples experience at present. Future research should aim at studying how these interventions help couples in improving their quality of life and decreasing their stress level.

8. Limitations

Only patients who attended hospital were studied so these findings cannot be generalised to those who do not seek treatment. Only couples experiencing primary infertility are studied hence cannot be generalised to couples experiencing secondary infertility. We did not study whether male infertility or female infertility is causing more stress and poor quality of life in couples.

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