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Comparative Assessment of Quality of Life Among Fertile and Sub- Fertile Women Attending a Tertiary Care Hospital

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ABSTRACT

Background: Subfertility is widely regarded as a deeply challenging and sensitive concern for couples, especially those who have been married for several years. Such couples may experience psychological distress and a diminished health-related quality of life (HRQoL). This study aimed to evaluate and compare the average quality-of-life scores between sub fertile and fertile women.

Methods:A cross-sectional investigation was conducted at the Department of Obstetrics and Gynaecology, Sheikh Saeed Memorial Campus, The Indus Hospital, Karachi, between 8 March 2022 and 8 September 2022. Women aged 18–40 years presenting to the outpatient obstetrics and gynaecology clinic were invited to participate. After a full explanation of the study's risks and benefits, informed consent was obtained. Participants' fertility status (sub fertile vs. fertile) and HRQoL were assessed. All data were recorded in a structured form appended to the dissertation.

Result:The study included 263 married women, with a mean age of 28.63 ± 5.02 years. Of these, 139 (52.9%) were classified as sub fertile. The mean scores were as follows: physical health 57.4 ± 17.42, psychological health 51.63 ± 17.64, social relationships 54.91 ± 19.87, and environment 43.23 ± 18.67. No statistically significant associations were detected between fertility status and any HRQoL domain.

Conclusion: Our findings indicate no significant differences in health-related quality of life between sub fertile and fertile women.

Keywords: HrQoL, Fertility, subfertility, sub fertile, primary, secondary.

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INTRODUCTION

Subfertility is a major global health concern, often accompanied by profound psychological distress [1]. Subfertility, a complex reproductive health issue is on the rise, contributing to emotional strain and reduced well-being. Estimates suggest that approximately 8–10% of couples worldwide experience sub fertility, and in regions like Pakistan and South Asia, prevalence rates appear even higher [2]. Beyond its physical impact, subfertility significantly diminishes quality of life (QoL). The World Health Organization classifies infertility as a social disability due to the stigma, emotional turmoil, and lowered self-esteem it generates, particularly in pronatalist societies [3].

Women most frequently bear the emotional burden: many endure social rejection, internalized stigma, marital dissatisfaction, and elevated levels of anxiety and depression especially when treatment fails or prolongs [4]. subfertility care commonly includes hormonal profiling, tubal patency assessment, and semen analysis, with treatment ranging from ovulation induction to in vitro fertilization. Assessing QoL has become integral to infertility management: instruments like FertiQoL and the WHOQOL-BREF offer reliable, cross-culturally validated evaluation of physical, emotional, relational, and environmental well-being [5,6].

Recent hospital-based data further emphasize this burden. A SIMS Services Hospital (Lahore) study reported that 66.7% of sub fertile women had low QoL across emotional, physical, and social domains—with better outcomes among younger, educated, and higher-income patients [7]. Qualitative research at a tertiary hospital in Peshawar identified key psychosocial themes family pressure, treatment fatigue, isolation, and recourse to unqualified providers highlighting systemic gaps in sub fertility care [8].

Given the consistently demonstrated impact of subfertility on women's psychological well-being and overall quality of life particularly in cultural contexts where childbearing is central to social identity there is a pressing need for evidence-based, context-specific research. While international literature has highlighted the psychosocial burden of subfertility, data from low- and middle-income countries, including Pakistan, remain limited. Moreover, existing studies often lack comparative analyses between fertile and sub fertile populations. Understanding these disparities is essential for informing patient-centred care, integrating psychosocial support into fertility services, and designing culturally appropriate interventions[9]. Therefore, this study seeks to comparatively assess the quality of life among fertile and sub fertile women attending a tertiary care hospital in Pakistan. By identifying the magnitude and domains of QoL impairment, the findings aim to support the development of comprehensive subfertility care that addresses both clinical and psychosocial dimensions of reproductive health.

MATERIAL AND METHODS

This study employed a cross-sectional design and was conducted in the outpatient clinics of Obstetrics and Gynecology at Sheikh Saeed Memorial Campus, The Indus Hospital, Karachi. The target population included married women aged 18 to 40 years who attended the clinic and were willing to participate. The data collection

period extended from March 8, 2022, to September 8, 2022. A sample size of 263 women was calculated using Open Epi 3.01, based on a 95% confidence level, 5% margin of error, and an estimated subfertility prevalence of 21.9%. A non-probability consecutive sampling technique was employed. Inclusion criteria comprised married women aged 18–40 years who consented to participate, while exclusion criteria included women with known mental disorders, recent bereavement (within one year), history of child adoption, BMI >40, and diagnosed endometriosis. After obtaining approval from the institutional review board (IRB), participants were informed about the study purpose, and informed consent was obtained. Interviews were conducted using the WHOQOL-BREF questionnaire in a designated area within the outpatient clinic to ensure privacy and confidentiality.

Study variables included demographic and clinical characteristics such as age, marital status, height, weight, income, comorbidities, occupation, residence, fertility status, and type of subfertility. The primary outcome variables were the frequency of subfertility and fertility, along with quality of life (QoL) scores.

Statistical Analysis

Statistical analysis was conducted using SPSS version 26.0. Quantitative variables (e.g., age, height, weight, years of education, duration of marriage, income, and QoL scores) were assessed for normality using the Shapiro-Wilk test, skewness, and kurtosis. Normally distributed variables were reported as mean ± standard deviation (SD), while skewed data were presented as median and interquartile range (IQR). Qualitative variables (e.g., occupation, family type) were expressed as frequencies and percentages. The independent t-test or Mann-Whitney U test was applied for comparing quantitative variables between fertile and sub fertile women, depending on data distribution. The chi-square test or Fisher's exact test was used for categorical variables. A p-value ≤ 0.05 was considered statistically significant. Potential confounders such as age, years of education, duration of marriage, and income were controlled through stratified analysis, followed by post-stratification chi-square testing.

RESULTS

The comparison showed no significant differences in age, education, income, or other demographic factors between fertile and sub fertile women. Both groups had similar social and economic backgrounds.

Sub fertile women reported slightly lower quality of life scores in all WHOQOL-BREF domains. However, none of the differences were statistically significant.

Table 1 presents a comparison of demographic characteristics between sub fertile and fertile women. No statistically significant differences were observed between the two groups across the examined variables, as all p-values exceeded the conventional threshold of 0.05. The distribution of age revealed that 50.3% of sub fertile women were under 30 years of age compared to 49.7% of fertile women, while 43.0% of sub fertile and 57.0% of fertile women were aged 30 years or above ($p = 0.290$). Regarding family structure, the proportions of women living in joint and nuclear families were nearly equivalent between the sub fertile and fertile groups, with no significant difference ($p = 0.890$). In terms of occupation, the majority of both sub fertile and fertile women were housewives (47.9% vs. 52.1%, respectively). Occupations such as maid, nurse, and teacher were

reported exclusively among fertile women, but these differences were not statistically significant (p = 0.211), likely due to small subgroup sizes. Educational attainment did not differ significantly between groups (p = 0.301). Among sub fertile women, the most common levels were matric (47.9%) and intermediate (56.0%), with comparable frequencies among fertile women. Although a higher proportion of fertile women had a monthly income of ≥30,000 PKR (59.5%) compared to sub fertile women (40.5%), this difference approached but did not reach statistical significance (p = 0.060). Lastly, obesity prevalence did not significantly differ between the two groups. Among sub fertile women, 41.0% were classified as obese, compared to 59.0% in the fertile group (p = 0.270).

Among the 263 women included in the study, 7 (2.7%) were diagnosed with hypertension, 10 (3.8%) had diabetes mellitus, 2 (0.8%) had chronic kidney disease (CKD), 61 (23.2%) were classified as obese, and 4 (1.5%) had a thyroid disorder. Additionally, 163 women (62.2%) were living in joint family systems, and the vast majority, 257 (98.1%), were housewives. A total of 95 women (36.1%). Among the 139 sub fertile women, primary subfertility was the most prevalent type, observed in 61.3% of cases.

Table 1. Comparison of Demographic Characteristics between Sub fertile and Fertile Women

Variable	Sub fertile n (%)	Fertile n (%)	p-value
Age			**0.290**
< 30 years	75 (50.3)	74 (49.7)	
≥ 30 years	49 (43.0)	65 (57.0)	
Family System			**0.890**
Joint	76 (46.6)	87 (53.4)	
Nuclear	47 (47.5)	52 (52.5)	
Occupation			**0.211**
Housewife	123 (47.9)	134 (52.1)	
Maid	0 (0.0)	3 (100.0)	
Nurse	0 (0.0)	1 (100.0)	
Teacher	0 (0.0)	1 (100.0)	
Education			**0.301**

Illiterate	7 (41.2)	10 (58.8)	
Primary	20 (54.1)	17 (45.9)	
Secondary	19 (36.5)	33 (63.5)	
Matric	45 (47.9)	49 (52.1)	
Intermediate	28 (56.0)	22 (44.0)	
Monthly Income†			**0.060**
< 30,000 PKR	72 (52.0)	66 (48.0)	
≥ 30,000 PKR	49 (40.5)	72 (59.5)	
Obesity			**0.270**
No	99 (49.0)	103 (51.0)	
Yes	25 (41.0)	36 (59.0)	

The distribution of key continuous demographic variables among the study participants. The mean years of education was 8.78 years (SD ± 3.56), with a median of 10 years and an interquartile range (IQR) of 7 to 10 years, indicating a slightly left-skewed distribution toward higher educational attainment. The mean monthly income was PKR 27,805.61 (SD ± 8,183.06), while the median income was PKR 25,000, with an IQR of PKR 24,000 to 35,000, suggesting a moderate right-skew in income distribution, with some participants earning substantially more as shown in Table 2. The mean duration of marriage was 4.88 years (SD ± 3.47), and the median was 4 years, with an IQR of 2 to 7 years, indicating a relatively young cohort in terms of marital duration.

Table 2. Sociodemographic Continuous Variables of Participants

Variable	Mean (SD)	Median (IQR)
Years of Education	8.78 (± 3.56)	10 (7–10)
Monthly Income (PKR)	27,805.61 (± 8,183.06)	25,000 (24,000–35,000)

Duration of Marriage (years)	4.88 (± 3.47)	4 (2–7)

A comparison of mean scores across the four domains of the WHOQOL-BREF questionnaire between sub fertile and fertile women. Across all domains, sub fertile women consistently reported lower quality of life scores compared to their fertile counterparts; however, none of these differences reached statistical significance ($p > 0.05$). In the physical health domain, sub fertile women had a mean score of 56.13 (SD ± 17.54), compared to 58.53 (SD ± 17.29) among fertile women ($p = 0.266$). The social relationship domain showed a mean score of 50.04 (SD ± 18.99) for sub fertile women versus 53.05 (SD ± 16.29) for fertile women ($p = 0.167$). Similarly, in the psychological domain, sub fertile women scored a mean of 53.22 (SD ± 20.37), while fertile women scored 56.41 (SD ± 19.35), with a p-value of 0.194. In the environmental domain, the mean score was 42.01 (SD ± 18.30) among sub fertile women and 44.33 (SD ± 18.99) among fertile women ($p = 0.315$) as shown in Table 3. Overall, although sub fertile women tended to have slightly lower QoL scores in each domain, the differences were not statistically significant.

Table 3. WHOQOL-BREF Domain Scores by Fertility Status

Domain	Sub fertile (mean ± SD)	Fertile (mean ± SD)	p-value
Physical Health	56.13 (± 17.54)	58.53 (± 17.29)	0.266
Social Relationships	50.04 (± 18.99)	53.05 (± 16.29)	0.167
Psychological Health	53.22 (± 20.37)	56.41 (± 19.35)	0.194
Environment	42.01 (± 18.30)	44.33 (± 18.99)	0.315

DISCUSSION

In our study, no statistically significant differences were observed between sub fertile and fertile women across demographic variables (age, family structure, occupation, education, income, obesity; all $p > 0.05$). Mean WHOQOL BREF scores were consistently lower in sub fertile women across physical (56.13 vs 58.53), psychological (53.22 vs 56.41), social (50.04 vs 53.05), and environmental (42.01 vs 44.33) domains, yet none of these differences reached statistical significance. Comparable recent investigations broadly confirm this pattern. Wotango et al., (2024) describe in our study that, In Ethiopia, sub fertile women had significantly lower HRQoL in psychological, social, and environmental domains, while the physical domain remained non-significant[10]. A comparative analysis from Adegoke, reported overall lower WHOQOL BREF scores in infertile women (69.86 ± 12.58 vs 72.21 ± 12.74), with a statistically significant deficit in the physical domain ($p = 0.04$), whereas other domains did not differ significantly[11]. Mokhtari et al. (2023) was found sub fertile women scored

worse across psychological, social, and environmental domains, although physical differences were not significant[12]. Ishrat et al., (2023) similarly identified the psychological domain as most disadvantaged among sub fertile women (mean 54.78 vs 61.12 physical, 70.36 social, 58.63 environmental), with 41.7% scoring ≤ 50 in that domain[13]. Collectively, these studies reinforce that psychological and social QoL is consistently poorer in sub fertile populations, while physical and environmental domains show more variability.

Systematic investigations further highlight that sub fertility-related stress, depressive symptoms, and stigma significantly impair QoL. A Chinese outpatient sample showed that sub fertility-related stress predicted lower QoL mediated by anxiety and depression[14]. Kiani (2021) emphasize resilience as a strong moderator, where higher resilience correlates with better QoL[15]. Another, systematic review identified sub fertility-related stigma including self-stigma and perceived social stigma as a powerful psychological burden detrimentally impacting QoL[16]. Meta-analytic evidence reveals that across low- and middle-income contexts, approximately 44% of sub fertile women experience clinically significant depression, exceeding rates in the general population[17]. Another meta-analysis demonstrated elevated anxiety symptom prevalence among sub fertile women, which correlates with decreased QoL[18]. Moreover, a descriptive-correlational study from Iran (2023–24, n=349) found that higher emotional intelligence was associated with lower infertility stigma and better QoL outcomes[19].

Cultural stigma remains a pervasive factor in South Asian populations. Alam et al. (2023) identified that sub fertile women in South Asia often experience internalized stigma and marital pressure that worsens psychological outcomes[20]. Socioeconomic status also plays a moderating role such as Siddiqui et al. (2025) found that lower income and education were significantly associated with reduced HRQoL among sub fertile Pakistani women[21]. Zhang et al. (2023) emphasized that QoL disparities follow global patterns, but low-income settings show more pronounced psychological burden[22]. A WHOQOL-BREF domain comparison in global sub fertility studies by Zhang et al. (2022) found psychological scores were most consistently impacted, followed by social and environmental domains[23]. In access-limited environments, Malik et al. (2025) demonstrated that lack of healthcare access significantly lowers QoL, particularly in LMICs[24]. This aligns with our Pakistani cohort, where socioeconomic constraints and cultural resilience may have buffered or masked statistically significant differences. Jalil et al. (2024) further noted that regional variation within Pakistan affects HRQoL, with urban women often reporting better outcomes than rural counterparts[25].

Comparing these findings with our cohort, sub fertile women demonstrated numerically lower domain scores—especially psychological and social consistent with global trends. The absence of statistical significance in our dataset may reflect modest effect sizes, cultural context in Pakistan influencing familial support, or limited statistical power. Income distribution nearly reached significance ($p = 0.06$), suggesting that socioeconomic determinants may shape QoL disparities. Our study contributes novel evidence from a Pakistani tertiary-care context, where cultural stigmatization and resilience mechanisms likely differ from other regions. Whereas global data consistently indicate deficits in psychological and social QoL among sub fertile women, our results mirror those of Ethiopian and Iranian studies especially in showing less pronounced physical domain differences—suggesting that income inequality and cultural resilience may moderate QoL outcomes. Clinical implications include integrating psychological support, resilience training, and targeted socioeconomic

empowerment within fertility care programs. Future research should consider larger sample sizes and the utilization of fertility-specific instruments such as FertiQoL to detect subtler differences and contextual domain vulnerabilities.

CONCLUSION

This study highlights that subfertility, while often associated with emotional and social challenges, did not significantly impact overall quality of life among women when compared with their fertile counterparts, as measured by the WHOQOL-BREF. The lack of statistically significant differences in quality of life domains may be attributed to the shared socioeconomic backgrounds, cultural context, and similar levels of access to healthcare among participants. These findings suggest that the psychosocial burden of subfertility may be mitigated by factors such as community support, marital stability, or cultural normalization of fertility issues. Future research should explore the long-term psychological and social trajectories of sub fertile women, incorporate male partners' experiences, and assess the effects of targeted counseling and support interventions to improve reproductive health outcomes and overall well-being.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

ETHICAL APPROVAL

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AUTHORS' CONTRIBUTIONS

Aneela Ashraf: Conceived and designed the study, supervised the project, and critically revised the manuscript for important intellectual content.

Sadia Shoeb: Contributed to data analysis and interpretation, and participated in manuscript drafting and final revision.

Malghalura: Was responsible for data collection and entry, assisted in literature review and preliminary data analysis.

Farah Tabassum: Participated in designing the methodology, reviewing the literature, and drafting sections of the manuscript.

Qaisra Ashraf: Assisted in patient recruitment, coordinated data collection, and reviewed the manuscript for clarity and accuracy.

Reeta Bai: Contributed to manuscript writing, formatting according to journal requirements, and ensured reference accuracy and ethical compliance

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