

## Original Research



## Quality of life and its associated factors among sub fertile couples in the Colombo District of Sri Lanka: a cross-sectional study

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### Abstract

**Introduction:** Pregnancy and motherhood are highly esteemed in Asian cultures. Consequently, subfertility is considered a major life issue for both men and women, which in turn could affect their quality of life (QOL).

**Objectives:** To assess the QOL and its associated factors among the partners of sub fertile couples

**Methods:** To identify the primary and secondary sub fertile couples, this community-based study used a stratified cluster sampling method to recruit 3366 married couples whose 15-49 aged female partners were residing in the Colombo district. Out of the 423 sub fertile couples identified, 384 were successfully interviewed. The Fertility Quality of Life (FertiQoL) tool, developed at Cardiff University was translated and culturally adapted to Sri Lanka to assess their QOL, based on the total score out of 100. An interviewer-administered questionnaire was used to collect data to assess the associated factors.

**Results:** In this study, median of the total FertiQoL score was 68.3 (IQR: 60.2-77.2) for male partners and 65.2 (IQR: 58.0-73.5) for female partners. Male partners had significantly higher scores than their female partners. Advanced age, longer duration of the marriage, higher level of education, and having at least one living child were found to be significantly associated ( $p < 0.01$ ) with the QOL of sub fertile couples.

**Conclusions & Recommendations:** The QOL was higher among male partners of the sub-fertile couples and male and female partners who had at least one living child. Negatively associated factors such as the age of the couple, duration of the marriage, and not having at least one living child should be prioritized when providing healthcare facilities.

**Keywords:** *primary subfertility, secondary subfertility, quality of life, associated factors*

## Introduction

The World Health Organization (WHO) has classified subfertility as a disease affecting millions worldwide. Subfertility prevalence is higher in developing countries than in developed countries (1-2). In 2006, the prevalence of primary and secondary subfertility was 15.6% among couples in the Colombo District, Sri Lanka (3).

Subfertility is considered a major life issue for both men and women, especially in developing countries where having a child is considered highly esteemed, and thereby more societal recognition gained by women than in developed countries (4-6). The inability to achieve a pregnancy therefore is usually coupled with low confidence, a feeling of shame and guilt, depression, sexual problems, lack of communication with friends and family members (7), and issues in their sexual relationship (8-9). However, these factors may vary with the couple's social and cultural background, family support and personality.

The 'FertiQoL' tool developed by the Cardiff Fertility Team at Cardiff University, United Kingdom measures the fertility related QOL (10). This tool has been validated in several countries and translated into more than 47 languages, including in Sri Lanka (11). It assesses the influence of fertility problems on diverse life areas, for example, on general health, self-perceptions, emotions, partnerships, family and social relationships, work-life, and future life plans (12).

According to previous studies, socio-demographic factors, such as having at least one living child, duration of primary or secondary subfertility and duration of marriage correlate with the QOL of sub-fertile couples (2, 13-14). Further, low QOL of sub fertile couples is associated with a high incidence of psychiatric problems such as anxiety and depression, which could in turn affect the life satisfaction, psychological well-being, and

continuation of treatment of sub fertile couples (7). Several studies have revealed that subfertility affects the QOL of both partners and is considered a shared condition. Therefore, assessment of the QOL of both partners is useful to determine whether intervention is needed for the individual or the couple. Identification of the factors associated with QOL is required in policymaking and guideline preparation for the management of subfertility. The objective of this study was to assess the QOL and its associated factors among the partners of sub fertile couples.

## Methods

Sub fertile couples were identified from a preliminary population-based cross-sectional study carried out in Colombo Regional Director of Health Services (RDHS) Area among married couples. From 18 medical officer of health (MOH) areas, 423 primary and secondary sub fertile couples were identified, out of which 389 successfully completed the data collection.

The preliminary study population consisted of married couples whose female partners were aged 15-49 years and residing in Colombo RDHS Area. Couples temporarily residing in the area for less than six months were excluded from the study. It was decided to recruit a sample of 3366 married couples, after adding a clustering effect of 9.9 and 10% non-response. While considering public health midwife (PHM) areas as clusters, a two-stage stratified cluster sampling technique with according to the number of married couples aged between 15-49 in urban and rural sectors was adopted to select 29 urban and 9 rural clusters. The number of clusters to be selected from each sector was determined by the total number of eligible couples in each sector according to the quarterly return provided by each MOH area in the first trimester of 2018. From each selected cluster, 90 couples were recruited with a pre-determined random selection method. Thereafter, a screening tool developed with expert

opinion was applied to all these couples to identify sub fertile couples. Data were collected from January to April 2019.

An interviewer-administered questionnaire was developed to assess the sociodemographic and other associated factors of QOL. The 'FertiQoL' tool consisting of 34 items measured QOL under two sections, 'Core FertiQoL' and 'Treatment FertiQoL'. Responses were obtained on a five-point Likert scale (11), with higher scores reflecting higher QOL. The raw score for each domain after appropriate coding for statistical analysis was transformed into scaled scores. The scaled score ranged from 0 to 100.

Four trained pre-intern medical graduates collected data by visiting homes. Both partners were interviewed separately during the same visit and precautions were taken to minimize the bias arising due to one partner's influence on the other partner's ideas. Since subfertility is a sensitive issue, privacy was adequately maintained.

#### **Data analysis**

Statistical Package for Social Sciences (SPSS) version 19 was used for data analysis. Total scores of the 'FertiQoL' tool were presented as mean, standard deviation (SD) and median with interquartile range (IQR). Wilcoxon Signed Ranked Test was used for testing the difference in the QOL among male and female partners. Mann Whitney U test was applied to determine the associations of categorical variables with QOL.

#### **Results**

Out of the 423 primary and secondary sub fertile couples identified in the preliminary study, 384 couples were interviewed successfully, yielding a 90.7% response rate. Female and male partners of the couples were predominantly Sinhala and Buddhist

and having General Certificate of Education Ordinary Level (GCE O/L) as the highest educational level. The majority of females were unemployed in contrast to males who were employed (Table 1).

The total (combined core and treatment subscales) 'FertiQoL' mean scores were 66.5 (SD=1.3) in the total sample (n=768); 68.2 (SD=11.4) among male partners; and 64.9 (SD=11.0) among female partners (Table 2). The difference in QOL in each couple as a unit was analysed with Wilcoxon signed-rank test, with a high number of negative ranks in most domains indicating that there is a negative difference between female and male partners. The 'FertiQoL' score indicated that male partners had higher QOL than the female partner of couples. The difference was significant ( $p<0.01$ ) in the total 'FertiQoL' and in all the domains of 'Core FertiQoL' subscale (Table 3).

There was a significant negative correlation between the duration of secondary subfertility with the 'emotional' domain score ( $p<0.01$ ), the 'mind/body' domain score ( $p<0.01$ ) and the 'treatment tolerability' domain score ( $p<0.01$ ); and a significant positive correlation with the education level the individual with 'social' domain ( $p<0.01$ ). There was a significant negative correlation between the duration of marriage with the 'relational' ( $p<0.01$ ), 'treatment environment' ( $p<0.01$ ) and 'treatment tolerability' ( $p<0.01$ ) domains (Table 4).

Male and female partners who were having at least one living child than those who were not having a living child had significantly higher 'total FertiQoL' scores in all domains ( $p<0.01$ ). Employed male and female partners had a significantly higher score in the 'emotional' domain ( $p<0.01$ ). Male and female partner, who were not on treatment had a significantly higher score in the 'mind/body' and 'treatment tolerability' domains ( $p<0.01$ ) (Table 5).

**Table 1: Distribution of male and female partners of sub fertile couples according to selected socio-demographic characteristics**

Characteristics	Female partners (n=389)		Male partners (n=389)	
	No.	%	No.	%
<b>Age in years</b>				
15-25	29	7.5	11	2.8
26-35	201	51.7	169	43.4
36-45	148	38.0	181	46.6
>45	11	2.8	28	7.2
<b>Ethnicity</b>				
Sinhala	329	84.6	326	83.8
Tamil	38	9.8	40	10.3
Muslim	20	5.1	21	5.4
Burger	2	0.5	2	0.5
<b>Religion</b>				
Buddhist	311	79.9	315	81.0
Christian	26	6.7	23	5.9
Hindu	20	5.2	21	5.4
Islam	32	8.2	30	7.7
<b>Highest Education Level</b>				
No formal education	2	0.5	3	0.8
Passed Grade 1-5	6	1.5	10	2.6
Passed Grade 1-10	72	18.5	91	23.4
Passed G.C.E (O/L) <sup>1</sup> or equivalent	198	40.9	180	46.2
Passed G.C.E.(A/L) <sup>2</sup> or equivalent	79	20.3	76	19.5
Higher education (Graduate)	32	8.2	29	7.5
<b>Sector</b>				
Rural	80	20.6	73	18.8
Urban	309	79.4	316	81.2
<b>Employment Status</b>				
Employed	149	38.3	366	94.1
Unemployed	240	61.7	23	5.9
<b>Income Level (Rs.)</b>				
≤ 15000	31	8.0	29	7.5
>15000-30000	126	32.4	129	33.2
>30000-50000	143	36.8	136	35.0
>50000-75000	58	14.8	67	17.2
>75000-100000	22	5.7	18	4.5
>100000	9	2.3	10	2.6

<sup>1</sup> General Certificate in Education (Ordinary Level); <sup>2</sup> General Certificate in Education (Advanced Level)

### Discussion

According to the present study results, being male and the presence of a living child were found to have a significantly higher QOL among sub fertile couples. The longer duration of marriage and duration of primary and secondary subfertility were

negatively associated, while the spouse’s education level was positively associated with the QOL. The total QOL mean and median were higher in male partners than in female partners.

**Table 2: Distribution of the ‘FertiQoL’ scores obtained for domains of quality of life**

	Total		Male		Female	
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)
Emotional	63.1 (17.1)	62.5 (54.0 -75.0)	66.2 (16.7)	66.6 (58.3-79.1)	59.9 (16.7)	62.5 (50.0-70.8)
Mind-body	67.2 (18.8)	66.7 (58.3 -83.3)	70.1 (18.9)	70.8 (58.3-87.5)	64.3 (18.3)	66.6 (54.1-79.1)
Relational	69.1 (16.1)	70.8 (58.3 -79.2)	70.7 (16.2)	72.9 (58.3-83.3)	67.5 (15.7)	70.8 (54.1-79.1)
Social	66.7 (15.1)	66.7 (58.3- 79.2)	68.4 (15.6)	66.6 (58.3-79.1)	65.0 (14.4)	66.6 (54.1-75.0)
<b>Core</b>	<b>66.5 (13.2)</b>	<b>66.6 (58.3- 76.0)</b>	<b>68.8 (13.3)</b>	<b>68.7 (59.3-79.1)</b>	<b>64.1 (12.5)</b>	<b>65.6 (57.2-72.9)</b>
Environment	61.4 (13.9)	62.5 (54.2 -70.8)	61.2 (14.1)	62.5 (50.0-70.8)	61.5 (13.7)	62.5 (54.1-70.8)
Tolerability	74.3 (18.8)	75.0 (62.5- 93.7)	74.8 (18.5)	75.0 (62.5-70.8)	73.8 (19.1)	75.0 (62.5-87.5)
<b>Treatment</b>	<b>66.6 (12.7)</b>	<b>67.5 (57.5- 75.0)</b>	<b>66.6 (12.4)</b>	<b>67.5 (57.2-75.0)</b>	<b>66.7 (12.8)</b>	<b>67.5 (57.5-75.0)</b>
<b>Total</b>	<b>66.5 (11.3)</b>	<b>66.9 (58.8- 75.0)</b>	<b>68.2 (11.4)</b>	<b>68.3 (60.2-77.2)</b>	<b>64.9 (11.0)</b>	<b>65.2 (58.0-73.5)</b>

The ‘FertiQoL’ score results in the present study are in line with the study done in Taiwan in 2013 (15), which revealed that the QOL is better in men than in women, where the ‘core FertiQoL’ for men was 60.63 (SD=14.07) against 54.39 (SD=13.52) for women. In the present study, the male partner had higher QOL compared to the female partner, and at the couple level (individual couples), in the emotional, mind/body and relational domains, and ‘core FertiQoL’ subscale and ‘total FertiQoL’ (p<0.01) (Table 3). Similar findings have been noted in several other studies. The study by Royani et al. (2019) using infertile couples revealed that such women had a lower QOL than infertile men (β=-

0.22; p<0.01) (13). A study done by Huppelhoten et al. (2013) in the Netherlands using the same ‘FertiQoL’ tool revealed that women scored significantly lower in the ‘FertiQoL’ total score. The same study also found that women were more at risk of developing emotional problems (16). The reason would be the coping strategies and lifestyles of the male and female partners would be different (5). In the current study, most of the females were unemployed (61.7%) compared to males (5.9%). Therefore, being at home and having a social responsibility to complete the family may be the reason for the decline in the quality of life of the female partner.

**Table 3: Comparison of the difference in the ‘FertiQoL’ tool scores among female and male partners of the sub fertile couple (couple-based analysis)**

Score difference- female & male	Rank	No. (n=389)	Mean Rank	Sum of Rank	Z score	p value
<b>Emotional domain</b>	Negative Rank	223	166.3	37088.0	-7.305	<b>&lt;0.01</b>
	Positive Rank	94	141.6	13315.0		
	Ties	72				
<b>Mind-body domain</b>	Negative Rank	208	163.5	34025.5	-6.048	<b>&lt;0.01</b>
	Positive Rank	104	142.3	14802.5		
	Ties	77				
<b>Relational domain</b>	Negative Rank	190	173.3	32936.5	-4.048	<b>&lt;0.01</b>
	Positive Rank	133	145.7	19389.5		
	Ties	66				
<b>Social domain</b>	Negative Rank	184	161.6	29737.5	-3.815	<b>&lt;0.01</b>
	Positive Rank	124	143.9	17848.5		
	Ties	81				
<b>Core-FertiQoL subsection</b>	<b>Negative Rank</b>	246	192.3	47307.0	-7.018	<b>&lt;0.01</b>
	<b>Positive Rank</b>	118	162.0	19123.0		
	<b>Ties</b>	25				
<b>Treatment Environment domain</b>	Negative Rank	119	114.6	13644.5	-0.761	0.44
	Positive Rank	121	126.2	15275.5		
	Ties	100				
<b>Treatment Tolerability domain</b>	Negative Rank	122	111.5	13606.5	-0.023	0.98
	Positive Rank	111	123.0	13654.5		
	Ties	108				
<b>Treatment-FertiQoL-subsection</b>	<b>Negative Rank</b>	133	117.9	15688.5	-0.537	0.59
	<b>Positive Rank</b>	122	138.9	16951.5		
	<b>Ties</b>	84				
<b>Total- FertiQoL</b>	<b>Negative Rank</b>	208	158.4	32962.5	-4.754	<b>&lt;0.01</b>
	<b>Positive Rank</b>	109	160.0	17440.5		
	<b>Ties</b>	22				

According to the present study, the presence of at least one living child in the family improved the QOL of both male and female partners. The findings are in line with the study by Sexty et al. (2018), where German women who had already been mothers had higher scores in the ‘emotional’ ( $\beta=0.52$ ;  $p<0.01$ ) and ‘mind/body’ ( $\beta=0.132$ ;  $p<0.05$ ) domains of the FertiQoL than a woman who never had a child (17). Further, in the present study, there is a negative correlation between the duration of the marriage and the ‘relational’ (marital relationship of the couple) domain in the ‘FertiQoL’ tool in the total sample ( $r=-0.126$ ;  $p<0.01$ ), indicating

that the marital relationship has deteriorated with the duration of marriage of the sub fertile couples. This result is in accordance with the research findings of a study done using the ‘FertiQoL’ in a German fertility centre (17), which revealed that the duration of a wish for a child had a negative impact on the ‘relational’ domain ( $p<0.01$ ).

The present study results pointed out that the duration of secondary subfertility had a negative correlation with the ‘Core’, ‘Treatment’ and ‘Total’ ‘FertiQoL’ scores in study participants, meaning that with increasing duration of subfertility, the QOL of

the partners decrease significantly. This finding is in line with the findings of Normavar et al. (2018) (18).

The present study revealed a finding that the educational level of individuals had a positive correlation with the social domain. A similar finding was reported by Normaval et al. (2018) that male participants without academic qualifications had lower scores on the emotional, mind/body, relational, social and total ‘FertiQoL’ domains. Karubulut et al. (2013) found that tertiary education was related to higher scores in the total, emotional, and environmental domains of the QOL (19). The association between QOL and higher level of education may be the fact that educated individuals are generally less embarrassed about their situation than those with less education, or it may even be due

to the better problem-solving skills of individuals who were better educated (8, 20).

According to the published literature, this is the first study conducted in Sri Lanka to assess the QOL of sub fertile couples using a valid tool, thus a strength of this study. However, some of the information related to the quality-of-life assessment on subfertility is sensitive. Therefore, the process of gathering information through an interviewer-administered questionnaire could have led to the under-reporting of sensitive information is a limitation of this study. All the possible precautions were taken to minimize the possible influence of one partner’s idea on the other partner in the couple. However, in some situations limited space was a challenge for the data collectors.

**Table 4: Association of selected socio-demographic variables of the sample with ‘FertiQoL’ domain scores (N=389)**

Variable	Domain					
	Emotional	Mind/ Body	Relational	Social	Rx Environment	Rx Tolerability
Current age	$r_s = -0.014$ $p = 0.688$	$r_s = -0.057$ $p = 0.111$	$r_s = -0.087$ $p = 0.016$	$r_s = -0.002$ $p = 0.960$	$r_s = -0.053$ $p = 0.159$	$r_s = -0.104$ <b><math>p &lt; 0.01</math></b>
Age at marriage	$r_s = -0.018$ $p = 0.623$	$r_s = -0.038$ $p = 0.287$	$r_s = -0.024$ $p = 0.504$	$r_s = 0.003$ $p = 0.923$	$r_s = 0.047$ $p = 0.221$	$r_s = 0.013$ $p = 0.739$
Duration of marriage	$r_s = 0.003$ $p = 0.925$	$r_s = -0.041$ $p = 0.258$	$r_s = -0.126$ <b><math>p &lt; 0.01</math></b>	$r_s = 0.008$ $p = 0.820$	$r_s = -0.144$ <b><math>p &lt; 0.01</math></b>	$r_s = -0.167$ <b><math>p &lt; 0.01</math></b>
Duration of primary subfertility	$r_s = 0.007$ $p = 0.900$	$r_s = -0.032$ $p = 0.563$	$r_s = -0.135$ $p = 0.013$	$r_s = -0.081$ $p = 0.130$	$r_s = -0.149$ <b><math>P &lt; 0.01</math></b>	$r_s = -0.110$ $p = 0.057$
Duration of secondary subfertility	$r_s = -0.203$ <b><math>p &lt; 0.01</math></b>	$r_s = -0.209$ <b><math>p &lt; 0.01</math></b>	$r_s = -0.084$ $p = 0.094$	$r_s = -0.112$ $p = 0.025$	$r_s = -0.041$ $p = 0.432$	$r_s = -0.214$ <b><math>p &lt; 0.01</math></b>
Duration of default treatments	$r_s = 0.047$ $p = 0.452$	$r_s = -0.031$ $p = 0.623$	$r_s = -0.032$ $p = 0.631$	$r_s = -0.033$ $p = 0.602$	$r_s = -0.027$ $p = 0.683$	$r_s = -0.069$ $p = 0.281$
Education level	$r_s = 0.069$ $p = 0.056$	$r_s = 0.007$ $p = 0.856$	$r_s = 0.086$ $p = 0.017$	$r_s = 0.094$ <b><math>p &lt; 0.01</math></b>	$r_s = 0.004$ $p = 0.918$	$r_s = -0.010$ $p = 0.759$
Family income	$r_s = 0.028$ $p = 0.432$	$r_s = -0.031$ $p = 0.386$	$r_s = -0.035$ $p = 0.305$	$r_s = 0.025$ $p = 0.481$	$r_s = -0.058$ $p = 0.124$	$r_s = -0.030$ $p = 0.405$

$r_s$  = Spearman correlation coefficient

**Table 5: Association of selected socio-demographic (categorical) variables of the total study sample with ‘FertiQoL’ domain scores (N=389)**

Variable	Domain, Median (IQR)					
	Emotional	Mind/Body	Relational	Social	Environment	Tolerability
<b>Employed</b>						
Yes	66.7 (54.1-75.0)	66.6 (58.3-83.3)	70.8 (54.1-83.3)	66.6 (58.3-59.1)	62.5 (50.0-70.8)	75.0 (62.5-93.7)
No	62.5 (50.0-70.8)	66.6 (54.1-79.1)	70.8 (58.3-79.1)	66.6 (54.1-66.6)	62.5 (54.1-70.8)	75.0 (62.5-87.5)
	<b>p&lt;0.01</b>	<b>p=0.01</b>	p=0.43	p=0.32	p=0.41	p=0.4
<b>Subfertility</b>						
Primary	62.5 (50.0-70.8)	66.6 (54.1-79.1)	70.83 (54.1-83.3)	66.6 (54.1-75.0)	58.3 (50.0-70.8)	75.0 (62.5-87.5)
Secondary	62.5 (54.1-75.0)	70.83 (58.3-83.3)	70.8 (58.3-83.3)	66.6 (58.3-79.1)	62.5 (54.1-70.8)	75.0 (62.5-93.7)
	<b>p=0.03</b>	<b>p=0.02</b>	p=0.85	<b>p=0.04</b>	p=0.37	<b>p=0.02</b>
<b>Have at least one living child</b>						
Yes	75.0 (62.5-83.3)	83.3 (66.6-91.2)	79.1 (62.5-87.5)	79.16 (66.6-87.5)	66.6 (54.16-75.0)	81.2 (68.7-93.7)
No	62.5 (50.0-70.8)	66.6 (54.1-75.0)	66.6 (54.1-75.0)	66.6 (54.1-75.0)	58.33 (50.0-70.8)	75.0 (62.5-87.5)
	<b>p&lt;0.01</b>	<b>p&lt;0.01</b>	<b>p&lt;0.01</b>	<b>p&lt;0.01</b>	<b>p&lt;0.01</b>	<b>p&lt;0.01</b>
<b>On treatment</b>						
Yes	62.5 (50.0-75.0)	66.67 (54.1-79.1)	70.8 (54.1-79.1)	66.6 (54.1-79.1)	62.5 (52.0-70.8)	75.0 (56.2-87.5)
No	66.6 (66.6-75.0)	75.0 (62.5-87.5)	70.8 (62.5-83.3)	70.8 (59.3-79.1)	62.5 (54.16-75.0)	87.5 (75.0-100)
	p=0.05	<b>p&lt;0.01</b>	p=0.03	p=0.05	p=0.15	<b>p&lt;0.01</b>

Mann–Whitney U test was applied; significant associations are in bold p values.

### Conclusions & Recommendations

The male partners had higher QOL than female partners in sub fertile couples and this difference was significant. Those having at least one living child had significantly better QOL. Factors like; the duration of the marriage, and duration of primary and

secondary subfertility were negatively associated with QOL, while the education level of the spouse was positively associated with it. The results highlight that when treating subfertility, the QOL of both partners of the couples should be addressed and priority given to couples with no children and longer duration of marriage.



### Public Health Implications

- Subfertility is coupled with low self-perception; poor marital and social relationships which lead to poor QOL associated with a high incidence of psychiatric problems.
- Despite the high prevalence, low and middle-income countries do not pay enough attention to this problem. Subfertility is a shared condition that affects both partners. Identifying the QOL of sub fertile partners with associated factors provides guidance to future plans of prioritizing Assisted Reproductive Techniques (ART) facilities.

### Author Declarations

**Competing interests:** The authors declare that they have no conflict of interest.

**Ethics approval and consent to participate:** Ethics clearance was granted by the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya, Sri Lanka. Informed written consent was obtained from each participant prior to data collection. (Ref No: P/282/12/2017).

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**Author contributions:** GG was the principal investigator and was involved in designing the study, developing the study instrument, supervising data collection, and conducting statistical analysis. SG and MW were the supervisors and provided the technical guidance and did the overall supervision. GG drafted the manuscript and SG and MW did the proofreading and modified the article.

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