QUALITY OF LIFE OF WOMEN WITH INFERTILITY IN GANDAKI PROVINCE, NEPAL

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ABSTRACT

Infertility is socially and emotionally challenging for married couples and can lead to significant stress, anxiety, and depression that adversely impact their quality of life. The study aimed to compare the quality of life among infertile and non-infertile women and identify factors associated with their quality of life. A cross-sectional analytical study was conducted among infertile and non-infertile women to compare their quality of life using the WHO Quality of Life-BREF (WHOQOL-BREF) questionnaire. Altogether, 92 married women of reproductive age (20-49) facing infertility/subfertility problems were selected as cases, and controls were selected in a 1:1 ratio with cases after matching. Written and verbal consent was obtained from patients, and ethical approval was obtained from the Nepal Health Research Council. Epi-data was used for data entry, and data was analyzed using SPSS. The data collection in this study was from May 20th, 2019, to June 20th, 2019. Multivariable analysis was applied to the variable after bivariate analysis for the adjustment. Fertile women reported significantly higher perceived stress (28.9±4.6 vs. 25.3±3.4, p<0.001), anxiety (8.7±3.0 vs. 7.8±2.9, p<0.001), and depression (8.1±2.7 vs. 6.9±2.5, p<0.001) compared to non-infertile women. Perceived social support was significantly lower in infertile women (p<0.001). Factors such as perceived stress (AOR 10.1, 95% CI: 3.5–29.2) and perceived social support (AOR 3.4, 95% CI: 1.2–10.1) were key determinants of QoL among infertile women. Among non-infertile women, moderate-to-severe depression (AOR 14.6, 95% CI: 2.4–89.9) and reproductive health problems (AOR 3.5, 95% CI: 1.0–12.5) significantly impacted QoL. The findings of this study revealed that the overall and inter-domain score on the quality of life of infertile women was lower than that of non-infertile women. The majority of the cases perceived social discrimination and violence. From multivariate analysis, perceived stress, and perceived social support were found as important determinants of quality of life among infertile women, and moderate to severe levels of anxiety, depression, perceived social support, and reproductive health problems were found as determinants of quality of life among non-infertile women.

KEYWORDS

Infertile women, non infertile women, reproductive age, subfertility

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INTRODUCTION

Infertility is defined as the inability of a couple to reproduce naturally.[1] Infertility in this study was taken as reproductive-age women at risk of becoming pregnant and who report unsuccessfully trying for a pregnancy for more than two years.[2] When motile and viable sperm can't be found in the ejaculation of a man then such a male can be considered infertile.[3] Infertility is a significant global public health issue with profound social and psychological consequences.[4] More than 186 million people worldwide suffer from primary or secondary infertility.[5,6] In South East Asia, infertility prevalence was (8-10) % in India, 10% in Pakistan, 11% in Srilanka, 15% in Bangladesh and 12% in Nepal.[7,8] The reproductive health service of Nepal primarily focuses on family planning services to prevent pregnancy through contraceptive methods but couples are struggling with infertility.[9] The majority (over 60.0%) of people do not choose to visit health facilities due to different socio-economic, cultural, and service-related factors.[10] People facing infertility problems often encounter high levels of stress, depression, marital dissatisfaction, and stigma all contributing to a decline in overall quality of life.[11] This study was designed to compare the quality of life among infertile and non-infertile women and identify factors associated with their quality of life.

MATERIALS AND METHODS

Study Design and Subject: A cross-sectional analytical study was conducted to assess the quality of life among infertile and non-infertile women and identify factors associated with their quality of life. The study was done in a community setting. We found a total of 1,351 women of reproductive age group while observing the site at the study period after surveying married women of reproductive age (20-49 years) to identify cases (infertile women) and controls (non-infertile women) from different four local institutions of Syangja (Putalibazar Municipality and Phedikhola Rural Municipality) and Kaski (Pokhara Metropolitan city and Rupa Rural Municipality) Districts as study areas, which were selected based on multistage sampling. The study population of this study was women of reproductive age (20-49) years[12–15] at risk of becoming pregnant, who report unsuccessfully trying for a pregnancy for more than two years, were selected as cases and married women of same reproductive age (20-49) without infertility problems from the same geographical areas were included as control in the research study.[2,12-15] The selected sample size was 92 cases and 92 controls.[16,17] The survey was conducted between 20th May to 19th June 2019 with a door to door survey method after getting ethical approval from the Nepal Health Research Council on 19th May 2019 (Ref.: 3035/2019). Those clients who did not want to take part in the research study and known male factor infertility were excluded from the study. The controls were selected by matching the same age, sex, and level of literacy with cases. The number of controls per case was 1:1. Written and verbal consent was taken from participants before data collection. Active case and control ascertainment was done by the principal investigators using semi semi-structured questionnaire to collect the data. The questionnaire was divided into seven sections. The first is the demographic characteristics of the participants. The second is about reproductive health problems, and the third section is about health service-seeking behavior. The fourth Perceived Stress Scale (PSS-14) with Cronbach's alpha (PSS-14) was 0.78.[18] The fifth WHOQoL-BREF was designed to measure the quality of life of participants.[19] The sixth, hospital anxiety and depression scale (HADS) consists of two subscales that examine anxiety (HADS-A, 7 items) and depression (HADS-D, 7 items).[20] Each item is scored on a 4-point Likert scale ranging from 0 to 3, with a score range of 0–21 for both subscales. Higher scores indicate a greater anxiety and depression state. The Cronbach's alpha for anxiety (HADS-A) was 0.76 and depression (HADS-D) was 0.68.[21] The seventh, multidimensional scale for perceived social support (MSPSS) tool. A seven-point Lickert scale is used for scoring the items and possible scores range from 12-84. The MSPSS has internal reliability (Cronbach's alpha for Family subscale- 0.87, Friend subscale-0.85, and Other subscale- 0.91).[22]

Determination of Sample Size: Sample size has been calculated using the given formula

$$\text{Sample size } n = \frac{r+1}{r}\frac{SD^2\,(z_\beta + z_\beta)^2}{d^2}$$

$71.56 \cong 72$

Where

r= 1 (ratio of controls to case)

SD= 15.83 (standard deviation, based on previous studies on quality of life)[23,24]

Zβ= 1.28 (standard normal variety for power for 90%)

Z(α/2) = 2.58 (standard normal deviate at 1% type I error (P<0.01)

d = 7.09 (expected mean difference between cases and controls, based on previous studies)[23,24]

By this formula

Sample size of case = 72

Considering a 20.0% non-response rate the total sample size was 90 cases and 90 controls

The selected sample size was 92 cases and 92 controls

Sampling procedures: In this study, the multi-stage sampling procedure was used to select districts, local institutions, and wards. Female Community Health Volunteer helped us with the proper identification of case and control in respective institutions.

Research tools and its development: A semi-structured questionnaire was used to collect the data. The questionnaire was divided into seven sections. The first section consists demographic characteristics of the participants. The second section sought information about reproductive health problems. Similarly, the third section contained about health service-seeking behavior of the participants and out-of-pocket expenditure for diagnosis and treatment of reproductive health problems.

The fourth section contained the Perceived Stress Scale (PSS-14). It contains 14 items and measures the perceived stress of respondents. The Cronbach's alpha for Perceived Stress Scale 14 (PSS-14) was 0.78.

WHOQoL- BREF is a self-administered questionnaire designed to measure QoL in the fifth section. A previously validated tool in Nepali (WHOQoL- BREF) was used to assess the quality of life of participants.[21] The classification of groups of quality of life was done based on previous literature.[25]

The sixth section contained the hospital anxiety and depression scale (HADS). The HADS is a 14-item self-report instrument and consists of two subscales that examine anxiety (HADS-A, 7 items) and depression (HADS-D, 7 items).[20] Each item is scored on a 4-point Likert scale ranging from 0 to 3, with a score range of 0–21 for both subscales. Higher scores indicate a greater anxiety and depression state. The Cronbach's alpha for anxiety (HADS-A) was 0.76 and depression (HADS-D) was 0.68.[21]

The seventh section contained a multi-dimensional scale for perceived social support (MSPSS) tool in Nepali versions. It is a 12-item questionnaire tool for measuring perceived social support from different three dimensions (family, friends, and important Others). A seven-point Lickert scale is used for scoring the items and possible scores range from 12-84. The MSPSS has internal reliability (Cronbach's alpha for Family subscale- 0.87, Friend subscale- 0.85, and Other subscale- 0.91).

Analysis of data: After data collection, cross-checking and cross-validation of data were done side by side during the analysis process. Epi-data was used for data entry and then transferred to SPSS-16 for further analysis. Missing values were not inferred. Categorical data was presented as numbers, percent, and continuous data as mean±SD. An $\alpha<0.01$ level was used to determine a statistically significant difference. The stress was measured using PSS-14 and the level of stress was categorized based on the mean score as low stress (less than the mean) and high stress (greater or equal to the mean).[18,26] Similarly, the quality of life score is also grouped based on the mean score as the quality of life score is less than the mean, and the quality of life score is greater or equal to the mean.[25,26] The other variables like anxiety, depression, and social support were categorized based on cutoff points as recommended by respective tools.

RESULTS

One hundred twenty-three married women aged (20-49) years were surveyed through a semi-structured interview among 1351 women from the study area. Among them, thirteen women with infertility problems refused to participate in research studies as cases. Eighteen known male factor infertility cases were excluded from the study after identifying through the in-person interview. Finally, ninety-two cases were included in the research study.

Univariate analysis: The mean age of marriage of infertile women (19 ± 3.083) was significantly lower than that of non-infertile women(18.05±2.226) ($p < 0.001$). In this study 92 infertile/sub-fertile and 92 non-infertile women with the mean age at marriage was 32.86±6.201 were evaluated. The average (Mean±SD) age at marriage among infertile and non-infertile was 18.7±2.759 years

Psychosocial problems of the participants: Among different psychosocial problems the perceived stress, anxiety, depression, and social support of participants were measured using different tools in this study. The study showed that infertile women perceived higher stress, anxiety, and depression than non-infertile women. Similarly, infertile women perceived lower social support than non-infertile women.

Among infertile women 71.7% perceived high stress, whereas only 38.0% of non-infertile

Table 1 : Socio-demographic characteristics of the participants

		Total n	Mean	SD	SE Mean	P value
Age	Cases	92	32.40	6.096	0.636	0.868
	Controls	92	33.33	6.304	0.657	
Education status	Cases	92	8.85	3.127	0.326	0.999
	Controls	92	8.34	3.070	0.321	
Age at marriage	Infertile	92	19.35	0.321	0.21	
	Non-infertile	92	18.70	0.232		

	Infertile		Non-infertile		Total	
	n	**%**	**n**	**%**	**n**	**%**
Types of family						
Nuclear	66	71.7	68	73.9	134	72.8
Joint	26	28.3	24	26.1	50	27.2
Ethnicity						
Brahmin / Chhetri	42	45.6	39	42.4	81	44.0
Janjati	22	23.9	28	30.4	50	27.2
Dalit	19	20.7	16	17.4	35	19.0
Muslim	6	6.5	4	4.3	10	5.4
Others	3	3.3	5	5.4	8	4.3
Religion						
Hindu	81	88	83	90.2	164	89.2
Islam	4	4.3	6	6.5	10	5.4
Buddhism	4	4.3	3	3.3	7	3.8
Christian	3	3.4	0	0	3	1.6
Occupation						
Housewife	26	28.3	43	46.7	69	37.5
Business	31	33.7	12	13	43	23.4
Agriculture	19	20.7	22	23.9	41	22.3
Private job	9	9.8	10	10.9	19	10.3
Governmental job	4	4.3	3	3.3	7	3.8
Labor	2	2.2	2	2.2	4	2.2
Student	1	1.0	0	0.0	1	0.5
Husband's occupation						
Foreign employment	23	25.0	33	35.9	56	30.4
Business	21	22.8	10	10.9	31	16.8
Agriculture	13	14.1	14	15.2	27	14.7
Private job	11	12.0	16	17.4	27	14.7
Labor	14	15.2	6	6.5	20	10.9
Governmental job	06	6.5	8	8.7	14	14.1
Pension	2	2.2	4	4.3	6	3.3
Housewife	1	1.1	1	1.1	2	1.1
Other	1	1.1	0	0.0	1	0.5

women perceived high stress. The mean score of perceived stress among infertile and non-infertile was 27.103±4.50. On average infertile women were found to perceive more stress (28.9±4.619) than non-infertile women (25.27±3.567). The levels of Anxiety and depression of participants were measured using HADS tools. Among infertile women, 39.1% had normal depression levels, 43.5% had mild depression levels, 16.3% had moderate depression levels and only 1.1% of infertile women had severe depression levels. Similarly, among non-infertile women, nearly two-thirds (65.2%) of non-infertile women had normal depression levels, 25% had a mild level and nearly one in ten (9.8%) had a moderate level of depression.

One-third of infertile women (33.7%) had normal anxiety levels, 41.3% had mild, 21.7%

Table 2: Psychosocial problems

Psychosocial problems		Infertile (n=92)		Non-infertile (n=92)		Total (n=184)	
		n	%	n	%	n	%
Perceived stress							
Below mean (normal stress)		26	28.3	57	62.0	83	45.1
Above mean(high stress)		66	71.7	35	38.0	101	54.8
Mean±SD		28.93±4.62		25.27±3.57		27.103±4.50	
Anxiety and depression							
Depression	Normal	36	39.1	60	65.2	96	52.1
	Mild	40	43.5	23	25	63	34.2
	Moderate	15	16.3	9	9.8	2	13.0
	Severe	1	1.1	0	0	1	0.5
	Mean±SD	8.14±2.67		6.86±2.49		7.50±2.65	
Anxiety	Normal	31	33.7	47	51.1	78	42.4
	Mild	38	41.3	30	32.6	68	37.0
	Moderate	20	21.7	13	14.1	33	17.9
	Severe	3	3.3	2	2.2	5	2.7
	Mean±SD	8.71±3.05		7.78±2.89		8.25±3.00	
Perceived Social Support							
Other support	Low PSS	1	1.1	0	0	1	0.5
	Medium PSS	35	38	15	16.3	50	27.2
	High PSS	56	60.9	77	83.7	133	72.3
Family support	Low PSS	5	5.4	0	0	5	2.72
	Medium PSS	37	40.2	19	20.7	56	30.4
	High PSS	50	54.3	73	79.3	123	66.9
Friend support	Low PSS	3	3.3	2	2.2	5	2.7
	Medium PSS	68	73.9	41	44.6	109	59.2
	High PSS	21	22.8	49	53.3	70	38.0
Total	Low PSS	1	1.1	1	1.1	2	1.1
	Medium PSS	56	60.9	19	20.7	75	40.8
	High PSS	35	38	72	78.3	117	63.6
	Mean±SD	58.77±7.87		64.06±7.78		62.22±8.54	

Table 3: Quality of life score of respondents

	Infertile n=92	Non-infertile n=92	Total n= 184
Domain	Mean±SD	Mean±SD	Mean±SD
Physical	60.66±9.38	68.64±11.16	64.65±11.3
Psychological	50.85±9.92	57.64±9.61	54.25±10.32
Social Relations	57.97±12.03	67.75±13.37	62.86±13.60
Environment	48.64±10.37	57.98±10.46	53.31±11.39
Overall score	54.01±7.79	62.30±7.82	58.15±8.82

Table 4: Association of infertility problems with demographic characteristics

Factors	Dependent	Infertile n (%)	Non-infertile n (%)	Chi-square value	OR (95% C.I.)	P-value
Occupation of respondents	Business/Job/ Labor	46 (63.0)	27 (37.0)	8.19	2.41 (1.3-4.42)	0.005#
	Agriculture*	46 (41.4)	65 (58.6)			
Age at marriage	≥ 20 years	42 (67.7)	20 (32.2)	11.877	3.02 (1.59-5.75)	0.001#
	< 20 Years*	50 (41.0)	72 (59)			
BMI of respondents	Below normal	5 (45.5)	6 (54.5)	8.44	1.18 (0.33- 4.12)	0.793
	Overweight and obesity	44 (63.8)	25 (36.2)		2.49 (1.33- 4.67)	0.004#
	Normal*	43 (41.3)	61 (58.7)			

**Reference catagories; # significantly associated*

Table 5: Association of perceived stress, anxiety and depression levels, and perceived social support with infertility problems

Factors	Fertility problem		Chi-sq. value	OR (95% C.I.)	p-value
	Infertile n (%)	Non-infertile n (%)			
Perceived stress					
High stress	66 (71.7)	35 (38)	21.09	4.13 (2.27-7.67)	<0.001#
Low stress *	26 (28.3)	57 (62)			
Perceived social support					
Low to medium Social support*	57 (62.0)	20 (21.7)	30.57	5.86 (3.06-11.21)	<0.001#
High Social support	35 (38.0)	72 (78.3)			
Hospital anxiety level					
Moderate to severe	23 (25)	15 (16.3)	5.91	2.32 (1.05-5.13)	0.037#
Mild	38 (41.3)	30 (32.6)		1.92 (0.99-3.71)	0.052
Normal*	3 (33.7)	4 (51.1)			
Hospital Depression level					
Moderate to severe	16 (17.4)	9 (9.8)	12.55	2.96 (1.18-7.40)	0.02#
Mild	40 (43.5)	23 (25)		2.89 (1.50-5.60)	0.002#
Normal*	36 (39.1)	60 (65.2)			

*Reference variable, #significant association

Table 6: Association between infertility problems with perceived social support

	Infertile n (%)	Non-infertile n (%)	Chi-sq. value	P-value	OR (95%CI)
Other support					
Low to medium support	36 (39.1)	15 (16.3)	11.963	0.001	3.3 (1.65-6.6)
high social support	56 (60.9)	77 (83.7)			
Family support					
Low to medium support	42 (45.7)	19 (20.7)	12.973	<0.001	3.23 (1.68-6.19)
high social support	50 (54.3)	73 (79.3)			
Friends					
Low to medium support	71 (77.2)	43 (46.7)	18.08	<0.001	3.85 (2.039-7.28)
high social support	21 (22.8)	49 (53.3)			

Table 7: Quality of life score mean difference among women with and without infertility (n=)

Quality of life	Infertile			Non-infertile			Mean Difference	P-value
	n	Mean	SD	n	Mean	SD		
Physical Health	92	60.66	9.38	92	68.64	11.16	-7.98	< 0.001
Psychological	92	50.58	9.92	92	57.64	9.61	-6.79	< 0.001
Social Relations	92	57.9	12.04	92	67.75	13.37	-9.78	< 0.001
Environment	92	48.6	10.37	92	57.98	10.4	-9.3	< 0.001
Overall QOL	92	54.0	7.79	92	62.3	7.82	-78.28	< 0.001

had moderate and only 3.3% of infertile women found severe anxiety levels. Similarly, among non-infertile women, more than half (51.1%) of respondents had normal anxiety levels, nearly one-third (32.6%) had mild anxiety levels, moderate level anxiety problems in 14.1%, and severe levels of anxiety among 2.2% of non-infertile-women. Among infertile women, 1.1% perceived low social support nearly two third (60.09%) of infertile women found perceived medium social support, and more than one-third (38.0%) of infertile women perceived high social support. Similarly, among non-infertile women, only 1.1% had perceived low social support, 20.7% had medium social support, and 78.3% perceived high social support.

Table 8: Factors associated with overall quality of life

Independent \ Dependent		QoL <mean score n (%)	QoL >= mean score n (%)	Chi-square value	OR (95% C.I.)	P value
Having RH Problems	Yes	75 (68.2)	35 (31.8)	42.99	9.18 (4.53-18.618)	<0.001#
	No *	14 (18.9)	60 (81.1)			
Infertility problem	Infertile	23 (25.0)	69 (75.0)	40.24	7.63 (0.89-14.70)	<0.001#
	Non-infertile*	66 (71.7)	26 (28.3)			
VDS	Yes	20 (90.9)	2 (9.1)	6.54	6 (1.31-27.33)	0.011#
	No*	55 (62.5)	33 (37.5)			
Ever faced miscarriage or abortion	Yes	30 (53.6)	26 (46.4)	6.01	2.34 (1.18-4.67)	0.014#
	No *	29 (33.0)	59 (67.0)			
Induced abortion	Yes	5 (23.8)	16 (76.2)	11.96	0.12 (0.03-0.43)	0.001#
	No*	25 (71.4)	10 (28.6)			
Social discrimination	Yes	33 (68.8)	15 (31.3)	10.80	3.14 (1.56-6.23)	0.001#
	No*	56 (41.2)	80 (58.8)			
BMI of respondents	Below Normal	3 (27.3)	8 (72.7)	15.29	0.60 (0.15-2.39)	0.470
	Overweight and obesity	46 (66.7)	23 (33.3)		3.20 (1.69-6.05)	<0.001#
Perceived stress	Normal*	40 (38.5)	64 (61.5)			
	High stress	70 (69.3)	31 (30.7)	39.30	7.60 (3.91-14.77)	<0.001#
	Low stress*	19 (22.9)	64 (77.1)			
Anxiety level	Moderate to severe	28 (73.7)	10 (26.3)	18.63	5.93 (2.50-14.09)	<0.001#
	Mild	28 (52.9)	32 (47.1)			0.011
Depression level	Normal*	25 (32.1)	53 (67.9)		2.38 (1.21-4.68)	
	Moderate to severe	22 (88.0)	3 (12.0)	39.69	16 (4.48-58.09)	<0.001#
	Mild	37 (58.7)	26 (41.3)		3.13 (1.61-6.06)	0.001
Perceived social support	Normal*	30 (31.3)	66 (68.8)			
	Low to medium PSS	58 (75.3)	19 (24.7)	38.52	7.48 (3.84-14.55)	<0.001#
	High PSS*	31 (29.0)	76 (71.0)			

*Reference categories, #significant association

From the above table, the mean quality of life score among total respondents was 58.15±8.82. The average total quality of life score as well as domain-wise quality of life score among infertile women (54.01±7.79) was lower than that of non-infertile women (62.3±7.82).

Factors associated with infertility was analysed by bivariate analysis. The above table showed that the occupation of respondents was significantly associated with infertility problems among women (p = 0.005). Women engaged in paid jobs were 2.41 times more likely to have infertility problems than women who have unpaid jobs (OR-2.241,95% CI: 1.30-4.42). Age at marriage of women, 20 years and above were significantly associated with infertility problems in women (p= 0.001). The socioeconomic status of respondents was not significantly associated with infertility problems. The body mass index of women was significantly associated with infertility problems in women. Women who are overweight and/or obese (>25 BMI) are 2.49 times more likely to have infertility problems than women having normal (18-25) BMI (OR-249, 95% CI: 1.3-4.67).

Association of psychosocial variables with infertility problems: The infertility problem was significantly associated with different psychosocial factors. The infertility problem was significantly associated with perceived stress (p <0.001). Women with infertility problems are more than four times more likely to perceive high stress than non-infertile women (OR-4.134, 95% CI: 2.27-7.67). Similarly, women with infertility problems are 5.86 times more likely to perceive low social support than non-infertile women (OR-5.863, 95% CI: 3.06-11.21). The infertile women were 2.32 times more likely to have moderate to severe levels of anxiety than non-infertile women. Similarly, the mild level of anxiety was higher among infertile women than non-infertile (OR-1.920, 95% CI: 0.993-3.713). Infertile women were nearly three times more at risk for moderate to severe levels of depression (OR-2.96, 95% CI: 1.18-7.40) and mild levels of depression (OR-2.89, 95% CI: 1.50-5.60) than non-infertile-women. The above table shows that women with infertility problems perceived lower friends, family, and other social support than non-infertile women (p <0.001).

Factors associated with quality of life: The mean score of overall quality of life and all physical, psychological, social relationships, and environmental domains in women with infertility was significantly lower than that of non-infertile women (p <0.001).

The quality of life score by WHO-QoL- BREF was categorized into two groups based on a mean score (52.01±7.98) in overall 100. Binary logistic regression was used to calculate the crude odds ratio between overall quality of life and socio-demographic variables. Reproductive health-related factors, having RH problems, infertility problems, vaginal discharge syndrome (VDS), and social discrimination were significantly associated with quality of life less than the mean score. Having RH problems (OR- 9.184, 95% CI: 4.53-18.618), infertility problems (OR-7.63, 95% CI: 3.89-14.70), VDS (OR- 6, 95% CI: 1.317-27.33), ever faces miscarriage or abortion (OR-2.34, 95% CI: 1.18-4.67) social discrimination (OR-3.14, 95% CI: 1.56-6.23) have quality of life less than mean score than those who have no such reproductive problems. Whereas having a history of induced abortion was found protective for the worse quality of life (less than mean score) than women without a history of induced abortion (OR-0.12, 95% CI: 0.036-0.433).

Similarly, the less-than-mean score on quality of life was significantly associated with different anthropometric and psychosocial variables such as the BMI of respondents, perceived stress, anxiety levels, depression levels, and perceived social support by respondents. The women with overweight and obesity were three times more likely to have less than mean score on quality of life than women with normal BMI (OR-3.20, 95% CI: 1.691-6.054). Similarly, women with high perceived stress were 7.60 times more likely to have less than the mean score on their quality of life than women with low perceived stress (OR-7.60, 95% CI: 3.91-14.77). The level of anxiety and depression were significantly associated with quality of life having less than the mean score. Moderate to severe level of anxiety (OR- 5.936, 95% CI: 2.500-14.092), mild anxiety level (OR-2.38, CI: 1.21-4.67), moderate to severe level of depression (OR-16, 95% CI: 4.48-58.09), mild depression level (OR-3.13, 95% CI: 1.61-6.06) levels of depression and anxiety were more likely to have less than mean score on quality of life than those with normal anxiety and depression levels. Likewise, the women who perceived low social support were 7.484 times more likely to have less than mean score on quality of life than perceived high social support (OR-7.48, 95% CI: 3.84-14.56) (Table 8).

DISCUSSION

Infertility is highly stressful to married couples and influences several aspects of life in women. It adversely affects the mental and social health of infertile couples.[27] It is considered a reproductive as well as social problem.[23,28] This study and other different studies showed nearly one in ten couples of reproductive-aged have infertility/subfertility problems in Nepal.[5,13,29,30] The median time of willingness to give birth to a new baby was 36 months (minimum-o, maximum- 300, IQR-96), and a somewhat longer duration (5.7 ± 5.5 years) has been shown by another study.[13,18,31–34] The causes of infertility were due to of male factors (16.3%) and female factors (29.0%). In 11.8% both male and female factors were observed and 42.7% of couples had unexplained infertility. More than half of infertility was secondary infertility 56.5%. Similarly, the proportion of secondary infertility cases shown by a study conducted in Africa is 49.9%.[33] Whereas a cross-sectional study in China showed a nearly similar prevalence of infertility (24.5%) to our study the proportion of primary (6.5%) and secondary (18.0%) infertility was different.[12] The study in Dhulikhel Hospital has shown that primary infertility was three times more common than secondary infertility.[13] But in our community-based study secondary infertility

found more than half (56.5%) of the cases. In this study the body mass index of women was significantly associated with infertility, both women with underweight and overweight were found at risk of infertility than normal-weight women. Whereas the risk of infertility in women with underweight was not significant (OR-1.18, p=0.79) women with overweight and obese (> 25 BMI) were found 2.49 times at risk of infertility than normal weight women (BMI 18.5-25) (OR-2.49, p=0.004). Similarly, this study is consistent with the study conducted in China that revealed underweight and obese women had high incidences of infertility, and the incidence of infertility was highest in the obesity group.[35] Similarly, women who have had a pelvic procedure or induced abortion(MVA) were significantly associated with infertility.[36]

This study revealed that infertile women were four times more at risk of perceived high stress (OR-4.13, p<0.001) and perceived social discrimination (OR-4.03, p<0.001) than non-infertile women. In line with our study, the risk of perceived high stress (OR-4.13, p<0.001) and perceived social discrimination (OR-4.03, p<0.001) than non-infertile women.[26,37,38] A study in India, Nigeria, and Africa found that different levels of stress due to infertility were significantly associated with the duration of infertility experienced by patients (p <0.05).[39-41] As such, holistic approaches to psychological counseling and treatment would be a better option for the management of infertility. The mean score of the anxiety of infertile women was 8.71± 3.05 whereas a study conducted in Hungary showed that the anxiety (48.76 ± 10.96 vs. 41.18 ± 11.26, p <0.001) was significantly higher in infertile women when compared to fertile.[42,43] This study found a low relationship between age and anxiety level. However, another study conducted in Hungary and Iran doesn't support this with (p-value=0.026).[42,43] In Kathmandu, Nepal infertile women were 2.463 times more at risk of moderate to severe levels of anxiety than non-infertile (Adjusted Odds Ratio [AOR] = 2.463, 95% Confidence Interval [CI]: 1.254–4.838) and in Iran infertile women have approximately three times higher odds of experiencing anxiety than fertile women (Odds Ratio [OR] = 3.25).[43,44] Thus most of the study found that anxiety and depressive disorder occur in bipolar direction.[45] Some studies have indicated that social support is related to lower depression and anxiety levels.[46]

This study found that the mean score of depression in infertile women was 8.14±2.67, whereas Japan showed that the mean score of depression level was 8.1 (SD = 3.7) among infertile women.[47] Multinomial logistic regression shows that socioeconomic status and infertility problems were significantly associated with the level of depression. The age and educational status of women were not significant with the level of depression, but similar types of studies showed that the age and education level of infertile women were significantly associated with anxiety and depression (p = 0.018).[15] Likewise, a cross-sectional study conducted in Iran showed that both ' partner depression affects an actor effect on their quality of life (β = − 0.589, p <0.001; β = −0.588, p <0.001).[40] These studies indicate that infertility can cause psychological distress in both male and female partner and directly hurts their quality of life.

This study showed that the mean score of total family support among infertile women (58.77±7.87) was significantly lower than that of non-infertile women (65.67±7.78) (p<0.001. , Women with primary infertility problems are 1.89 times more likely to have low social support. A cross-sectional study also revealed that infertility stress was strongly associated with perceived social support in both men and women partners of infertile couples.[18] Similarly, a statistically negative significant relationship was found between the multidimensional scale of perceived social support at the level of (p<0.01).[48] Social support from the family and partner lowers the anxiety and depression level which leads to the proper social functioning and decision-making capacity in women.

In this study, the mean score of quality of life was found significantly lower in infertile women (54±7.79) than in non-infertile women (62.3±7.82) (P <0.001). Similarly, other studies have also shown infertile women have less than the mean score on their quality of life.[11,24,49] A case-control study showed dissimilar findings than our study where the mean score of physical, psychological, relationship, and QoL in infertile women was significantly more than in fertile women.[23] Other studies have shown that infertility is a distressing and painful experience, especially for women having lower quality of life scores.[24,37,50] These dissimilar findings were due to women getting more parenting challenges, which may be due to patriarchal societal norms and values that include male partner should not involve in parenting tasks in fertile women and due to gynecological problems such as endometriosis, fibroid, expensive treatment procedures, social stigma, lifestyle-related factors such as alcohol and smoking habit may play a crucial role in the low score on the quality of life.

In this study, the perceived stress was significantly associated with the quality of life of infertile women (p <0.001). Infertile women with high perceived stress were 8.96 times more likely to have less than the mean quality of life score (OR-8.9, 95% CI: 3.2-25.29). Consistent with these results, a previous study had shown that infertile women experience more feelings of helplessness in comparison to fertile women and they are more at risk of mental and emotional disorders, depression, anxiety, low self-esteem, and marital dissatisfaction.[43] The results showed that women with high anxiety and depression had lower levels of QoL score. Among infertile women, moderate to severe levels of anxiety (OR-6.632, 95% CI: 1.312-33.512), moderate to severe levels of depression (OR-9.545, 95% CI: 1.123-80.506) levels of depression and anxiety were more likely to influence their quality of life than those with normal anxiety and depression levels which is in line with the results of other authors.[15,37] A study conducted in the infertility center, in Tehran, has also found that women facing infertility problems have worse quality of life and is associated with high depression and anxiety levels, failure in previous treatment, and an unknown cause of infertility. Multivariate analysis showed that anxiety (β = -1.59, p <0.001) and depression (β = -2.09, p <0.001) hurt Q0L.[37] From this study, we found that QoL was significantly associated with Body mass index level; depression, and anxiety level in bivariate analysis, whereas this relationship was not observed in multivariate analysis after adjusting other variables. From multiple logistic regression only two factors, perceived stress (AOR-10.13, 95% CI: 3.52-29.18) and perceived social support (AOR-3.412, CI: 1.15-10.101) found as important determinants of the quality of life among infertile women. In the Nepali context, more priority is given to offspring and culture. Family, and power-related value, the child is assumed to be the power of the family and representative of the father and family so family and psychosocial pressure may be more in infertile couples, especially women who face social discrimination and violence, which would hurt their quality of life.

Although the institutional-based study on infertility and its impact on quality of life has been widely studied, there are relatively few community-based studies of infertility and its impact on quality of life, which is the strongest part of this study. This study has some limitations, firstly it was limited only to infertile and non-infertile women; the known male factors of infertility were not addressed in this study. Although the study was done through in-person interviews there was a chance of potential recall bias and self-reporting issues. The sample size was small which limits the generalizability to the entire population of the country.

The findings of the study show that women with infertility have a lower mean quality of life score l in comparison to non-infertile women. High perceived stress, mild to severe levels of depression and anxiety, perceived social support, and reproductive health problems were found to be significant determinants of QoL among infertile women.

Recommendations: The results of this study may empower decision makers to design evidence based specific strategies for providing promotive reproductive health services on regular basis to address the infertility and its associated problems in the implementation program of the country.

Implications: The findings of the study could be used for the research in large-scale studies related to infertility.

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