

Comparative Study on Postpartum Quality of Life among Women after Normal Vaginal Delivery and Cesarean Section

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ABSTRACT

Introduction: Postpartum period is accompanied by physical, emotional and social changes in women's health. The mode of delivery whether cesarean section or normal vaginal delivery could lead to different levels of changes in physical and mental health of women, thereby affecting their quality of life. Therefore, the study was aimed to compare the postpartum quality of life among women after normal vaginal delivery and cesarean section.

Methods: Descriptive cross-sectional comparative study was conducted from 6th April to 6th August, 2023. Following ethical approval (Reference number 08/2023), purposive sampling technique was used to select 100 postpartum women with normal vaginal delivery and 100 with cesarean section. Face to face interview was done using Rand SF-36 questionnaire. Using Statistical Package for Social Sciences version 22, descriptive analysis and unpaired t-test was done to compare two groups.

Results: The mean physical health summary score of postpartum women after normal vaginal delivery (70.90 ± 11.63) was significantly higher than in cesarean section group (46.41 ± 13.96) with p-value < 0.001 . Similarly the mean mental health summary score of postpartum women after normal vaginal delivery (72.88 ± 12.17) was also significantly higher than in cesarean section group (64.19 ± 16.20) with p-value < 0.001 .

Conclusions: Normal vaginal delivery is linked with better quality of life in both physical and mental health than cesarean section. Thus, healthcare providers will need to provide appropriate counseling regarding modes of delivery to help pregnant women in making informed decisions for positive childbirth experience.



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INTRODUCTION

Pregnancy and childbirth leads to physical, psychological and social changes in women that can affect her postpartum quality of life (QoL).¹⁻³ The mode of delivery, whether normal vaginal delivery (NVD) or cesarean section (CS), have significant effect on both mother and baby which can contribute to quality of life during postpartum period. Globally, CS rates have increased from 6.7% to 21.1%, in Asia from 4.4% to 19.5% and in Nepal from 5% to 18.2% (2011-2022).⁴⁻⁶ Studies comparing QoL after NVD and CS show mixed results.^{7,8} Some studies elicit better QoL among NVD mothers, while others find no significant difference.⁹⁻¹¹ Studies from countries like Iran, Hong Kong and Nepal present varying outcomes.¹²⁻¹⁶ Therefore, to address the variation and controversy, this study is aimed to compare postpartum quality of life between women of normal vaginal delivery and caesarean section. Hence, the findings can support

healthcare providers and women in making informed decisions about their positive childbirth experience.

METHODS

A descriptive, cross-sectional comparative study design was used. The study was conducted at Civil Service Hospital, Gynecological OPD and the immunization clinic which was carried out from April 6th 2023 to August 6th 2023. Study population included postpartum women having a normal vaginal delivery or an elective cesarean section followed up at 6 weeks postpartum or the immunization clinic for DPT 1st vaccination of their child at 6 weeks after delivery. Ethical approval was taken from Institutional Review Committee (IRC) of Civil Service Hospital (Reference number 08/2023). The objective

of the study was explained to postpartum women through an information sheet. After obtaining written informed consent from respondents, face to face interview was taken, which took about 15-20 minutes. No monetary incentive was provided to respondents while confidentiality and privacy were maintained. No one was forced to participate in the study. The study population was selected without any discrimination regarding ethnicity, education and economic status. If any health deviations were noted among postnatal mothers, they were referred to the gynaecological OPD for further consultation. Primiparas having antenatal care, giving birth to a term, live, and singleton baby with routine discharge from the hospital were included in the study while those with instrumental and complicated delivery, emergency caesarean section, having low birth weight baby and women with postpartum depression or other psychiatric disorders were excluded.

The sample size was calculated using a formula for comparing two independent means.¹⁷ $N = (2 \times S_p^2 \times [Z_{1-\alpha/2} \pm Z_{1-\beta}]^2) / \mu_p^2$ where S_p^2 is pooled standard deviation with $S_p^2 = (S_1^2 + S_2^2) / 2$, S_1^2 is standard deviation in 1st group, S_2^2 is standard deviation in 2nd group, $Z_{1-\alpha/2}$ is desired level of significance, $Z_{1-\beta}$ is desired power and μ_p is mean difference between samples. Based on results from previous study¹⁵ $S_1 = 16.60$, $S_2 = 19.87$, $\mu_p^2 = 9.3$, $Z_{1-\alpha/2} = 1.96$ (at 5% level significance), $Z_{1-\beta} = 1.64$ at 95% power. We get $n = (2 \times 335.19 \times [1.96 \pm 1.64]^2) / 9.3^2 = 8687.99 / 86.49 \approx 100$

This gives required sample size of 100 participants per group. Since the study includes two groups, the study recruited 100 postpartum women having normal vaginal delivery and 100 postpartum women having elective cesarean section. This resulted in total study population of 200 postpartum women.

Non-probability purposive sampling technique was used and data was collected using face-to-face interview technique. Data collection tool was divided into two parts. Part I included socio demographic information which included 8 questions about age, education, occupation, ethnicity, religion, family type, mode of delivery and ANC contact. Part II included standard questionnaire 36-Item Short Form Health Survey (SF-36) developed by Research and development (RAND) Health Care.¹⁸

Rand SF-36 was a set of widely used and easily administered standard instrument measuring health related quality of life. It consists of 36 questions, categorized into eight scales of scores across functional health and wellbeing. Eight scales included Physical Functioning (PF) with 10 items, role limitation due to physical problems or Role Physical (RP) with 4 items, Bodily Pain (BP) with 2 items, General Health (GH) with 5 items, Vitality (VT) with 4 items, Social Functioning (SF) with 2 items, role limitation due to emotional problems or Role Emotional (RE) with 3 items and Emotional well-being (EW) with 5 items. These eight scales further aggregate into two distinct summary measures called physical health summary (based on PF, RP, BP, and GH scales) and mental health summary (based on VT, SF, RE, and EW scales). The score of each subscale ranged from 0 to 100, where 0 indicates lowest level of health and 100 indicates

highest level of health. A higher score indicating better quality of life in that specific scale. It also included a single item that provides an indication of perceived change in health.¹⁸

RAND SF-36 is highly reliable instrument with satisfactory construct validity. Reliability estimates for summary measures have exceeded 0.9.¹⁹ Rand SF-36 has also been already validated for use in Nepal by Bhandari et.al. with cronbach's alpha of overall SF-36 score as 0.85 and test retest correlation coefficient as 0.78 ($p < 0.05$).²⁰ The instrument has also been used in previous studies involving Nepalese populations.^{15, 21}

After collecting data, the data was checked for completeness of information. Data was then coded, entered in SPSS version 22 for analysis. Descriptive statistics - frequency, percentage, mean and standard deviation were used to describe collected data. Since data was normally distributed, inferential statistics unpaired t- test was used to identify significant difference at 5% level of significance (p value < 0.05). The normality test of data using Shapiro-Wilk test indicated significant deviations from normality for most variables ($p < 0.05$), which included physical health mean score, mental health mean score across both NVD and CS group and total quality of life satisfied normality assumptions ($p > 0.05$) in both groups. However, parametric independent t-test was used because of adequate sample size per group based on central limit theorem. In addition, to account for potential violations of homogeneity of variances identified by Levene's test, Welch adjusted t-test was reported for those subscales where Levene's test was significant ($p < 0.05$), whereas standard t-test was reported when equal variances were assumed ($p > 0.05$).

RESULTS

The study included total 200 postpartum women, with 100 postpartum women having normal vaginal delivery and 100 having caesarean section. Mean age of postpartum women having NVD was 26.55 ± 3.65 years and those having CS was 28.14 ± 4.95 years. Education levels included 9 (9%) women with primary level, 18 (18%) with secondary level, 38 (38%) with higher secondary and above, and 35 (35%) with bachelor's degree and above among women having NVD, and 16 (16%), 10 (10%), 19 (19%), and 55 (55%), respectively, among women having CS. Occupation included homemaker, business, service, and student, with 58 (58%) and 51 (51%) women being homemakers in the NVD and CS groups, respectively. ANC contact of ≥ 8 contacts was noted in 81 (81%) of NVD women and 74 (74%) of CS women, while < 8 contacts were noted in 19 (19%) and 26 (26%), respectively. Family type included nuclear and joint families, with 57 (57%) and 43 (43%) women in the NVD group and 64 (64%) and 36 (36%) in the CS group, respectively. Ethnicity included Brahmin, Chhetri, Janajati, Madhesi, Dalit, and Muslim, with Janajati 37 (37%) in the NVD group and Chhetri 36 (36%) in the CS group (Table 1).

Physical health summary scores of postpartum women were assessed according to type of delivery. The mean scores for physical functioning, role limitation due to physical problems,

bodily pain, and general health were 79.25 ± 12.41 , 64.75 ± 27.08 , 69.20 ± 14.83 , and 70.40 ± 14.79 , respectively, among women with normal vaginal delivery, and 58.40 ± 17.26 , 35.00 ± 27.52 , 41.35 ± 14.78 , and 50.90 ± 20.68 , respectively, among women who underwent caesarean section. Unpaired t-test showed statistically significant differences in the mean scores between the two groups for physical functioning ($t=9.805$, $p<0.001$), role limitation due to physical problems ($t=7.704$, $p<0.001$), bodily pain ($t=13.293$, $p<0.001$), and general health ($t=7.666$, $p<0.001$) (Table 2).

Table 1. Socio-demographic Information of the Respondents (n=200).

Characteristics	Normal Vaginal Delivery n*(%)	Caesarean Section n**(%)
Age Group (Completed Years)		
20-25	39(39)	33(33)
26-30	47(47)	37(37)
31-35	14(14)	21(21)
36-40	0(0)	9(9)
Mean $\pm$ SD	26.55 $\pm$ 3.65	28.14 $\pm$ 4.95
Education		
Primary level	9(9)	16(16)
Secondary level	18(18)	10(10)
Higher secondary and above	38(38)	19(19)
Bachelor and above	35(35)	55(55)
Occupation		
Homemaker	58(58)	51(51)
Business	25(25)	25(25)
Service	11(11)	22(22)
Student	6(6)	2(2)
ANC Contact		
≥ 8 contacts	81(81)	74(74)
< 8 contacts	19(19)	26(26)
Type of Family		
Nuclear	57(57)	64(64)
Joint	43(43)	36(36)
Ethnicity		
Brahmin	30(30)	23(23)
Chhetri	22(22)	36(36)
Janajati	37(37)	33(33)
Madhesi	6(6)	5(5)
Muslim	2(2)	1(1)
Dalit	3(3)	2(2)
n*: Normal vaginal delivery (n=100); n**: Caesarean section (n=100) ANC: Antenatal care; SD: Standard deviation		

Mental health summary scores of postpartum women were assessed according to type of delivery. Statistically significant differences were observed in vitality and social functioning scores between women with normal vaginal delivery and those who underwent caesarean section. The mean vitality score was 71.85 ± 13.68 and 59.00 ± 21.67 ($t=5.014$, $p<0.001$), while the mean social functioning score was 70.50 ± 16.62 and $47.00 \pm$

23.10 , respectively ($t=8.257$, $p<0.001$) (Table 3).

The mean physical and mental health summary scores were compared between women with normal vaginal delivery and caesarean section using an independent t-test. Statistically significant differences were observed in physical health summary scores (70.90 ± 11.63 vs. 46.41 ± 13.96 ; $t=13.478$, $p<0.001$) and mental health summary scores (72.88 ± 12.17 vs. 64.19 ± 16.20 ; $t=4.286$, $p<0.001$) (Table 4).

DISCUSSION

This study findings with NVD reported significantly higher physical (70.90) and mental mean health summary scores (72.88) compared to those with CS (46.41 and 64.19) respectively, indicating a better overall postpartum quality of life among the NVD, with $p<0.001$ which is consistent with study done in India.²² The result of this study demonstrates that vaginal delivery is safe choice of birth for mother and family, if there were no indication of CS. Due to support of health care provider during labor stages, use of pain reduction techniques and low surgical intervention, vaginal delivery could become safer choice. In contrast, study done in China and Iran showed no significant difference between NVD and CS women groups.^{23,24} These could be due to use of insufficient sample size and different tools other than SF-36 for measurement of quality of life among postpartum women.

This study depicts, NVD women scored significantly higher in all subscales of physical health; PF, RP, BP and GH compared to CS women ($p<0.001$). This was due to women with vaginal deliveries resuming physical activities more easily and experiencing fewer physical restrictions and less pain during the postpartum period. This aligns with studies conducted by Cecyli et. al and Damtie et. al in different settings, which have consistently shown that women who deliver vaginally tend to have faster physical recovery and fewer postoperative complications than those who undergo cesarean delivery.^{25,26} Similar studies from Nepal had also reported that NVD women group tend to recover more quickly, experience fewer postpartum complications and report better psychological well-being.^{15,16} This might be the possible reason that CS, is often associated with prolonged wound healing, postoperative pain and delayed mobility, which can significantly limit a mother's ability to perform daily tasks and care for her newborn. The lower general health perception among CS women group in this study further highlights how surgical recovery can negatively influence subjective well-being and physical self-assessment in the early postpartum phase.

Similarly, NVD women had significantly higher scores in two mental health subscales; VT and SF compared to the CS women group ($p<0.001$) which was consistent with the study done in Egypt.¹¹ This could be due to less emotional strain after normal vaginal delivery compared to CS. Similarly there is possibility that NVD women experienced higher level of mental health due to the perception of natural birth. The results of this study are

Table 2. Physical Health Summary Scores of Postpartum Women by Type of Delivery (n=200).

Physical Health Subscales	Normal Delivery Mean±SD	Cesarean Section Mean±SD	t-value	p-value	95% CI
Physical functioning (PF)	79.25±12.41	58.40±17.26	9.805	0.000*	16.65-25.04
Role limitation due to physical problem (RP)	64.75±27.08	35.00±27.52	7.704	0.000*	22.13-37.36
Bodily pain (BP)	69.20±14.83	41.35±14.78	13.293	0.000*	23.71-31.98
General health (GH)	70.40±14.79	50.90±20.68	7.666	0.000*	14.48-24.51

SD: Standard deviation; CI: Confidence Interval; PF: Physical functioning; RP: Role limitation due to physical problems; BP: Bodily pain; GH: General health. Possible score in each variable (0-100), *statistically significant (p<0.05) at 95% CI.

Table 3. Mental Health Summary Scores of Postpartum Women by Type of Delivery (n=200).

Mental Health Subscales	Normal Delivery Mean±SD	Caesarean Section Mean±SD	t-value	p-value	95% CI
Vitality (VT)	71.85±13.68	59.00±21.67	5.014	0.000*	7.79-17.90
Role limitation due to emotional problem (RE)	71.35±31.43	76.66±28.62	-1.255	0.211	-13.71-3.05
Social Functioning (SF)	70.50±16.62	47.00±23.10	8.257	0.000*	17.88-29.11
Emotional Wellbeing(EW)	77.84±12.80	74.12±15.57	1.845	0.067	-0.25- 7.69

SD: Standard deviation; CI: Confidence Interval; VT: Vitality; RE: Role limitation due to emotional problems; SF: Social functioning; EW: Emotional wellbeing. Possible score in each variable (0-100), *statistically significant (p<0.05) at 95% CI.

Table 4. Comparison of Mean Physical Health Summary Score and Mean Mental Health Summary Score of Normal Vaginal Delivery and Cesarean Section. n=200

Variables	Normal Delivery Mean±SD	Cesarean Section Mean±SD	t- value	p- value	95% CI
Physical health summary	70.90±11.63	46.41±13.96	13.478	0.000*	20.90- 28.07
Mental health summary	72.88±12.17	64.19±16.20	4.286	0.000*	4.68- 12.67

SD: Standard deviation; CI: Confidence Interval. *statistically significant (p<0.05) at 95% CI

also in line with the systematic review and meta-analysis study, which found that women in the NVD women group had higher quality of life on the VT and SF mental health subscales than those in the CS women group.²⁷

In contrast, some studies didn't report any significant difference in QOL between NVD group and CS group.^{3,28} Likewise a study done by Torkan et al.¹² showed that women who had cesarean deliveries had a higher mental health quality of life compared to those with NVD. This can be attributed to family members providing greater care after a surgical treatment, which is seen as a complicated occurrence that calls for additional attention.

The study was limited to health facility setting thus findings of the study may not be generalized to all postpartum women. Since the study design is cross sectional, longitudinal study design could provide precise information regarding change in quality of life across postpartum duration. Also the use of non probability sampling introduces selection bias compromising true representation of sample, which does not comply with sample size required from standard sample size calculation. Additionally, the Rand SF-36 questionnaire makes use of question based on past weeks which could have chances of recall bias.

CONCLUSION

Postpartum women who delivered vaginally exhibit significantly better physical and mental health related quality of life

compared to those who undergo CS. The results highlight the need for healthcare providers to offer enhanced support to mothers recovering from CS and to promote safe vaginal birth practices when possible. Thus, women will be able to have an informed decision to choose vaginal delivery unless intervention is required, rather than request CS as a mode of delivery without any indications.

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Conflict of Interest: None.

Data Availability Statement: The data are available from the corresponding author upon reasonable request.

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