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Original Research

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Factors Associated With Postpartum Care During the Fourth Stage of Labor in Nepal: A Hospital-Based Cross-Sectional Study

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Abstract

Postnatal care is an important part of maternal and neonatal care, and life-threatening complications can occur during the postpartum period. Empirical information on the level of postpartum care services is generally scarce in Nepal. Key elements of postpartum care during the fourth stage of labor include providing proper nutrition, promoting breastfeeding, and helping the mother manage any physical discomforts or challenges that may arise. This study investigated the level of postpartum care services delivered during the fourth stage of labor in a tertiary-level hospital in the Chitwan district of Nepal. A descriptive cross-sectional hospital-based study was conducted among 148 women admitted for vaginal delivery. A set of structured observation checklists was developed and finalized based on the WHO Recommended Interventions for Improving Maternal and Newborn Health: Integrated Management of Pregnancy and Childbirth. The structured observation checklist had twenty-two items, including twelve critical steps. A good level of care was valid with a score of ≥ 90% based on total items, including all twelve critical steps of care, and a poor level of care was valid with a score <90%. The purpose of the study was explained to and written informed consent was obtained from all respondents. Ethical approval was received from the Institutional Review Committee of Chitwan Medical College. One third (33.8%) of the women received a good level of postpartum care services. Women's residence (p = .021), number of pregnancies (p =.002), and number of antenatal visits (p =.029)

Note: I acknowledge the management of the hospitals for their support; nursing staffs for facilitating the study and I appreciate respondents for their valuable time and kind cooperation. —AKP

were significantly associated with the level of postpartum care during the fourth stage of labor. Going forward, it will be important for Nepal to enhance the capacity of clinicians or nurses to provide postpartum care as per WHO guidelines.

Keywords: *fourth stage, labor, postpartum care, tertiary hospital, women, Nepal*

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Introduction

The terms postpartum period and postnatal period are frequently used interchangeably, but in fact postpartum refers to issues associated with the mother and postnatal to those concerning the baby (World Health Organization [WHO], 2010). The postpartum period is a time of transition for a new mother and her new family, when adjustments need to be made on physical, psychological, and social levels. This begins immediately after childbirth and lasts 6 weeks (Fahey & Shenassa, 2013; WHO, 2010).

Maternal morbidities include all illnesses and complications associated with childbearing, which may occur during pregnancy and all through the postpartum period of 42 days, sometimes causing maternal deaths (Koblinsky et al., 2012). Approximately 287,000 women died during childbirth or due to pregnancy-related complications in 2020 (WHO, 2023). A large proportion of maternal deaths occur during the 48 hours following childbirth, and most (99%) happen in developing countries (WHO, 2015). Potential complications during the first two hours postpartum include postpartum hemorrhage, hypovolemic shock, perineal hematoma formation, urinary retention, and infection. Postpartum hemorrhage (PPH) accounts for approximately 35% of all maternal deaths (WHO & UNICEF, 2012). About 14 million women in the world suffer from PPH every year, or 26 women per minute (Ashigbie, 2013).

The fourth stage of labor is the period of time immediately after the birth of a baby, characterized by the delivery of the placenta. Postpartum care during this stage is centered on the promotion of physical and emotional well-being for both the mother and the newborn. This includes monitoring for any complications or problems that may arise after the birth, providing support and education to the mother to help her adjust to her new role, and ensuring that the mother and baby are bonding and that the baby is healthy and thriving.

In this context, the overall purpose of postpartum care is to maintain and promote the health of the woman and her baby and also foster an environment that helps and supports the extended family and community with a wide range of health and social needs (WHO, 2010). Postpartum care covers the management of the mother, newborn, and infant during the postpartum period. Because the early postpartum period is highly stressful for a new mother, timely, high-quality postpartum care is central to protecting maternal health (Xiao et al., 2020). Globally in 2017, about 295,000 women died during and following pregnancy and childbirth of related causes. The overwhelming majority of those deaths (94%) occurred in low-resource settings (WHO, 2019). In Nepal, approximately 57% of Nepalese women receive some form of postnatal care (PNC) within the first two days of delivery; this care is most commonly provided by a nurse or midwife (MoHP/Nepal et al., 2017).

A guideline from WHO (2015) emphasized the importance of early follow-up from an experienced clinician or nurse to prevent infant and maternal morbidity and mortality during the fourth stage of labor and the postpartum period. During the first hour after delivery, the clinician or nurse should accompany the mother, encourage her to eat and drink, perform a rapid assessment for emergency management, palpate the uterus

for hardness and roundness, massage the uterus, assist the mother in passing urine, assess the mother's perineal condition, keep the baby with the mother, assist the mother to initiate breastfeeding, and document all findings, treatment, and procedures. During the first two hours after delivery, the clinician or nurse should encourage the mother to eat and drink, administer prescribed medication to the mother, provide health education to the mother, encourage the mother to ambulate, provide the mother with information about the postpartum condition, carry out a rapid assessment for emergency management, palpate the fundus, massage the uterus, assess the mother's perineal condition, encourage the mother to pass urine, encourage the mother to breastfeed, and document all findings, treatment, and procedures (WHO et al., 2015).

The early postpartum period, within two hours of birth, is crucial, and little is known about whether the current postpartum care services provided by hospitals in Nepal meet the standards of the WHO. This descriptive cross-sectional, hospital-based study aims to assess the level of early postpartum (within one and two hours after delivery) care services delivered during the fourth stage of labor in the maternity ward of a 600-bed tertiary-level hospital (Bharatpur Hospital) in Chitwan district in Nepal.

Methods

Study Design and Setting

A descriptive cross-sectional research design seeks to explain what already exists in a group or population and is useful for investigating the distribution of variation across study populations with different characteristics. This type of study is generally quick, easy, and inexpensive to perform (Aggarwal & Ranganathan, 2019), although results are merely associations and do not imply causation. A descriptive cross-sectional hospital-based study was conducted among women admitted for vaginal delivery in the maternity ward of Bharatpur Hospital from January 12 to February 5, 2020.

Study Population, Recruitment, and Sampling Procedure

The study population was estimated through the records of the maternity ward. A total of 1,404 vaginal deliveries were performed during the past 3-month period, and the average number of monthly vaginal daytime (7 a.m.–7 p.m.) deliveries was estimated at 234. We derived a total sample size of 148 by using the formula: $n = N/1+N\,(e^2)$ [where n = required sample size, N = population size (N = 234), e = level of precision (e = .05 at 95% confidence level)]. Only women admitted during the daytime in the maternity ward for vaginal delivery at Bharatpur hospital from January 12 to February 5, 2020 and who were willing to participate were included in the study. To generalize the results among the study population and to minimize bias, women admitted with odd registration numbers in the maternity ward during the study period were the only research participants for this study. Excluded from the study were women admitted with even registration numbers, women admitted for non-vaginal delivery, mothers whose babies were admitted to the Neonatal Intensive Care Unit (NICU) due to low birth weight, mothers who delivered stillbirths, and mothers who were unable to answer or reluctant to participate.

Data Collection

Before data collection, a set of data collection tools was developed, pretested, and finalized. Part 1 was related to participants' sociodemographic features, so it was used for face-to-face interviews. Part 2 was a structured observation checklist used to assess the institutional capacity of the hospital. Part 3 was an observation checklist used to assess the level of postpartum care services delivered within 60 minutes and 120 minutes immediately after delivery of the participants. Parts 2 and 3 were adapted from *Pregnancy, Childbirth, Postpartum, and Newborn Care: A Guide for Essential Practice* (WHO et al., 2015). These checklists had 22 items, including 12 critical steps. A good level of care was valid with a score of ≥ 90% based on total items,

including all 12 critical steps of care, and a poor level of care was valid with a score <90% based on total items. Experienced and graduate nurses were involved as field researchers to collect the data from the maternity ward, and observations were made as per the standard of *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice* (3rd ed.) published by WHO (2015).

Data Analysis

The collected data was edited, reviewed, and checked for completeness. Version 20 of the Statistical Package for Social Sciences (SPSS) was used to analyze the data. We used percent distribution, made comparisons for descriptive analysis, and applied a Chi-square test to assess the factors associated with the level of postpartum care services delivered during the fourth stage of labor.

Informed Consent and Ethical Approval

The purpose of the study was explained to the respondents before data collection; written informed consent had been obtained from the respondents and ethical approval from the Institutional Review Committee of Chitwan Medical College in Nepal.

Results

Sociodemographic Features of the Participants

A total of 148 women participated in the study, and Table 1 provides sociodemographic characteristics, including age, residence, type of family, and level of education. Of the total, less than half (42.5%) were aged 21–30 years, followed by 20 years old or less (39.9%), and last by over 30 years old (17.6%). The median age was 23; the minimum age was 16, and the maximum age was 40. The majority (40.5%) of women were Brahmins, and Dalits (12.2%) represented the lowest percentage. The majority of the women (82.4%) were Hindu, lived in the urban municipality (67.6%), and were in a joint family (76.4%). More than half (56.8%) had completed secondary-level education, and a majority (41.2%) were house workers.

Table 1. *Sociodemographic Features of Women (*N = *148)*

Variables	Category	Frequency (%)
Age (in years)		
	≤20	59 (39.9)
	21-30	63 (42.5)
	>30	26 (17.6)
Median = 23 IQR = Q3 – Q1 = 28–20; Min = 16, Max = 40		
Ethnicity		
	Brahmin	60 (40.5)
	Chhetri	27 (18.2)
	Janajati	43 (29.1)
	Dalit	18 (12.2)
Religion		
	Hindu	122 (82.4)
	Non-Hindu (Buddhist, Christian, Islam)	26 (17.6)
Residence		
	Rural	48 (32.4)

Variables	Category	Frequency (%)
	Urban	100 (67.6)
Type of family		
	Nuclear	35 (23.6)
	Joint	113 (76.4)
Educational Status		
	Basic	38 (25.7)
	Secondary	84 (56.7)
	Bachelor and above	26 (17.6)
Occupation		
	Self-employed	58 (39.2)
	Job in public/private institution	39 (19.6)
	House workers	61 (41.2)

Table 2 shows the distribution of obstetrics-related factors in the participants. More than half (52%) were multigravid, and, of those, the vast majority (89.7%) had delivered their last child in a health facility. Of all participants, 79.7% had completed four or more antenatal visits.

Table 2. *Obstetric-Related Characteristics of Postpartum Women (*N = *148)*

Independent variables	Category	Frequency (%)
Gravida		
	Primi	71 (48.0)
	Multi	77 (52.0)
Previous institutional delivery (*n*=77)		
	Yes	69 (89.7)
	No	8 (10.4)
Number of antenatal visits		
	<4 visits	30 (20.3)
	≥ 4 visits	118 (79.7)

Observed Postpartum Care Services Within the First Hour of the Fourth Stage of Labor

Postpartum care during the fourth stage of labor was assessed within the first hour (60 minutes after delivery) and second hour (60 to 120 minutes after delivery). This section covers postpartum care services observed within the first hour. Based on the observation check list (Part 2), the provision of critical and general care was assessed; the distribution is shown in Table 3. All women were assisted to void their urine and assessed for perineal conditions. While less than half of the women (41.2%) received a rapid assessment for emergency management, 79.7% of the women had their uterus palpated to determine the hardness and roundness. In terms of general care, all the women were kept with their babies and provided companionship, and more than half (56.8%) were encouraged to eat and drink.

Table 3. *Postpartum Care Services Within the First Hour of the Fourth Stage of Labor (*N = *148)*

Independent variables related to postpartum care within first hour of the fourth stage of labor	Women received	
	Complete care No. (%)	Incomplete care No. (%)
Critical steps of care		
Rapid assessment for emergency management	61 (41.2)	87 (58.8)
Palpation of uterus for hardness and roundness	118 (79.7)	30 (20.3)
Massage of uterus	119 (80.4)	29 (19.6)
Assisting mother to pass urine	148 (100)	
Assessment of mother's perineal condition	148 (100)	
Assisting mother with breastfeeding	105 (70.9)	43 (29.1)
General care		
Companion provided for mother	148 (100)	
Encouraging mother to eat and drink	84 (56.8)	64 (43.2)
Baby kept with mother	148 (100)	
Documentation of all findings, treatment, and procedure	137 (92.6)	11 (7.4)

Observed Postpartum Care Services Within the Second Hour of the Fourth Stage of Labor

This section covers postpartum care services observed within the second hour (60 to 120 minutes after delivery) of the fourth stage of labor. Critical and general care services were evaluated using the observation checklist (Part 3); the distribution of these is shown in Table 4. Among the critical steps of care, almost all the women (96.6%) were encouraged to feed their babies; the perineal condition was assessed for more than half of the women (52.7%). More than half (57.4%) received a rapid assessment for emergency management. A significant proportion (98.6%) of the women received prescribed medication and health education about the importance of postpartum care, and nearly half (45.3%) of the mothers were informed about their postpartum condition.

Table 4. *Postpartum Care Services Within the Second Hour of the Fourth Stage of Labor (*N = *148)*

Independent variables related to postpartum care within second hour of the fourth stage of labor	Women received	
	Complete Care No. (%)	Incomplete Care No. (%)
Critical steps of care		
Rapid assessment for emergency management	85 (57.4)	63 (42.6)
Palpation of fundus	108 (73.0)	40 (27.0)
Massage of uterus	115 (77.7)	33 (22.3)
Assessment of perineal condition	78 (52.7)	70 (47.3)
Encouraging mother to pass urine	126 (85.1)	22 (14.9)
Encouraging mother to breastfeed	143 (96.6)	5 (3.4)
General care		
Encouraging mother to eat and drink	138 (93.2)	10 (6.8)
Administering prescribed medication to mother	146 (98.6)	2 (1.4)
Providing health education to mother	146 (98.6)	2 (1.4)

Encouraging mother to ambulate	79 (53.4)	69 (46.6)
Informing mother about postpartum condition	67 (45.3)	81 (54.7)
Documentation of all findings, treatment, and procedures	104 (70.3)	44 (29.7)

Observed Institutional Capacity to Deliver Postpartum Care Services

Institutional capacity was assessed through the observation method using a checklist (Part 2) and interaction with the nurse in-charge of the maternity ward. Variables listed in Table 5 show the capacity of the maternity ward of Bharatpur Hospital to deliver quality postpartum care. There was no standard hospital protocol for postpartum care services, but the hospital had adequate supplies such as emergency drugs, cotton, gauze, pads, gloves, and teaching aids for postnatal care. There was insufficient postnatal care monitoring equipment, such as thermometers, sphygmomanometers, I/V stands, and peri lights, in the maternity ward. There were three beds in the labor room, with an average of 2.64 staff for the morning shift and 2 for the day shift. The duty hours of nurses in Nepal consist of three shifts. Usually, the morning shift begins at 7 a.m. and ends at 1 p.m. The day shift follows from 1 p.m. to 7 p.m., while the night shift extends from 7 p.m. to 7 a.m. the next morning. The average number of deliveries from 7 a.m. to 7 p.m. was 16.36. A total of 28 beds were available for the postnatal ward; one staff member was assigned there for the morning shift and one for the day shift. There were an average number of 35.68 postpartum women on the morning shift and 25.16 on the day shift.

Table 5. *Independent Variables Related to Institutional Capacity*

S. N.	Institutional level independent variables	Observation Response
1	Availability of standard hospital protocol	No
2	Availability of adequate supplies (drugs, cotton, gauze, pad, gloves)	Yes
3	Availability of adequate equipment (blood pressure instrument, thermometer, I/V stand, peri light)	No
4	Number of beds in labor room	3
5	Average number of deliveries on morning and day shifts (7 a.m. to 7 p.m.) (minimum = 9, maximum = 20)	16.36
6	Average number of labor room staff on morning shift (minimum = 2, maximum = 3)	2.64
7	Average number of labor room staff on day shift	2
8	Number of beds in postnatal ward	28
9	Number of staff on each shift in postnatal ward	1
10	Average number of postnatal mothers on morning shift in postnatal ward (minimum = 18, maximum = 43)	35.68
11	Average number of postnatal mothers on day shift in postnatal ward (minimum = 7, maximum = 36)	25.16

Level of Delivered Postpartum Care Services

Table 6 shows the level of postpartum care services delivered in the maternity ward of Bharatpur Hospital. Only one-third (33.8 %) of the women received a good level of postpartum care services; the other two-thirds (66.2%) received a poor level of postpartum care.

Table 6. *Level of Postpartum Care Services Delivered to Participants*

Level of postpartum care services*	Frequency	Percentage
Good care ≥90% including all 12 critical steps	50	33.8
Poor care < 90%	98	66.2
Total	148	100.0

*Total item = 22, possible score 0 to 22

Factors Associated With Postpartum Care Services During the Fourth Stage of Labor

The Chi-square test has been used to measure the association between the dependent and independent variables. Table 7 shows the level of postpartum care services is statistically significant in relation to residence (p = .021), the number of pregnancies (p = .002), and the number of antenatal visits (p = .029) of the women, since the p-value was less than 0.05 (p = .000). However, ethnicity (p = .249) and educational status (p = .080) of the women were insignificant to the level of postpartum care services, since the p-value is more than .05.

Table 7. *Association Between Level of Postpartum Care Services and Selected Variables (*N = *148)*

Variables	Level of postpartum care services		χ2	*p*-value
	Good No. (%)	Poor No. (%)		
Age				
≤20 years	18 (30.5)	41 (69.5)	5.726	.057
21-30 years	18 (28.6)	45 (71.4)		
>30 years	14 (53.8)	12 (46.2)		
Ethnicity				
Brahmin	21 (35.0)	39 (65.0)	4.114	.249
Chhetri	13 (48.1)	14 (51.9)		
Dalit	5 (27.8)	13 (72.2)		
Janajati	11 (25.6)	32 (74.4)		
Residence				
Rural municipality	10 (20.8)	38 (79.2)	5.326	.021*
Municipality	40 (40.0)	60 (60.0)		
Educational Status				
Basic	17 (44.7)	21 (55.3)	5.047	.080
Secondary	22 (26.2)	62 (73.8)		
Bachelor and above	11 (42.3)	15 (57.7)		
Number of pregnancies				
Primi	15 (21.1)	56 (78.9)	9.773	.002*
Multi	35 (45.5)	42 (54.5)		
Number of antenatal visits				
<4 visits	4 (15.4)	22 (84.6)	4.773	.029*
≥ 4 visits	46 (37.7)	76 (62.3)		

*Statistically significant

Discussion

Postpartum care is an important part of maternal care, as serious and life-threatening complications can occur in the postpartum period, even in a woman who has had an uneventful pregnancy and delivery. During the postpartum period, women have to adapt to significant hormonal and physical changes, potentially while learning to care for a new baby. It is a time of transition for a woman and her new family (Spelke & Werner, 2018). During the first 6 to 12 hours following birth, when the mother is recovering from the acute physical effects of the birth, and during the 2-to-6-week period following, physical, hormonal, and emotional changes and recovery occur. Immediate adjustments are therefore essential on physical, psychological, and social levels (Romano et al., 2010). Acute conditions, such as pelvic floor trauma, infection, and hemorrhage, as well as the effects of chronic health conditions, such as diabetes and hypertension, are the major health risks during this period. Postpartum depression and substance use disorders can also be contributing factors to poor health outcomes (Romano et al., 2010; Spelke & Werner, 2018).

The World Health Organization (2015) has clearly suggested that clinicians or nurses should provide different types of services to recently delivered mothers and neonates during the first and second hours after delivery in the fourth stage of labor. Previous studies have focused on late postpartum and/or postnatal periods, and very few were on early postpartum care services provided by hospitals as per the standards of the World Health Organization. Of those that do consider the early postpartum period, a study in Egypt showed that more than two-thirds of nurses had poor knowledge regarding the management of the third and fourth stages of labor (Eman et al., 2018). A high proportion of neonates did not receive recommended postnatal care in Ghana, Guinea, and Nigeria (Emma et al., 2021). In Nepal, the main barriers to providing quality basic obstetric and newborn care in maternity wards have been a lack of equipment and the absence of national medical standard guidelines, medicines, and health commodities in health facilities (Acharya et al., 2018).

In this context, our study of the maternity ward at the Bharatpur Hospital in the Chitwan district of Nepal revealed that a large majority (66.2%) of the mothers there received poor postpartum care services, and only one-third (33.8%) of them received good postpartum care services, during the early postpartum period. These findings are similar to those of Tanzania's Mbalizi Hospital, where only 41.95% of mothers received some form of postpartum care services (Lotto, 2015). In sub-Saharan Africa, mothers in lower-level public facilities had lower odds of receiving postpartum care services than those in public hospitals (Benova et al., 2019). In Nepal, an earlier study showed that 57% of women had received a checkup in the first 2 days after childbirth, while 42% of women had not received any form of postnatal checkup (MoHP/Nepal et al., 2017).

Our study revealed significant gaps in emergency management care during the first hour of the fourth stage of labor, with only 41.2% of mothers receiving a rapid assessment. However, there were positive aspects observed during this period, such as more than half of the mothers being encouraged to eat and drink, and all mothers being kept with their babies and provided companionship. In the second hour of the fourth stage of labor, improvement in perineal condition care observed, with over half of the mothers (52.7%) receiving the necessary attention. Additionally, a high percentage (96.6%) of mothers were encouraged to feed their babies, emphasizing the importance of early breastfeeding initiation.

The results of the current study are comparable to those of an earlier study in Egypt, in which the majority of midwives did not monitor the mother's vital signs after delivery, and examinations of mothers' breasts, uterus, lochia, vulva, and perianal areas were done for only 61.5%, 25%, 22.1%, 34.6%, and 25% of participants, respectively (Lamadah et al., 2014).

Our study revealed that an inadequacy of equipment and health commodities, insufficient beds, and human resources at the postpartum ward were factors in the poor level of postpartum care service. The Nepal Health Facility Survey of 2021 (Ministry of Health and Population, Nepal et al., 2022) also highlighted the

insufficiencies of equipment, as well as a lack of national medical standard guidelines, medicine, and commodities for basic obstetric and newborn care. A study in northern Ethiopia has also reported that most health institutions do not have standard hospital protocols regarding postpartum care services, and only 7% of health facilities follow national medical guidelines (Berhe et al., 2019).

Our study suggests that the place of residence may impact the accessibility and quality of care received during the postpartum period. In addition, the number of pregnancies and a greater number of antenatal visits tended to receive more comprehensive care during the postpartum period. These findings highlight the importance of considering individual factors, such as residence, pregnancy history, and antenatal visits, when assessing the level of postpartum care received. Regarding the residential factor of the mother, a systemic review of postnatal care in low- and middle-income countries by Etienne et al. (2015) suggested that women living in rural settings had a 1.36 times higher likelihood (95% CI: 1.01–1.81) of utilizing postnatal care compared to women living in urban areas. In Eastern China, increase in distance from the nearest hospital, there was a 1.49 times higher likelihood of reduced utilization of postpartum services (Gu et al., 2018). Results from Northern Ethiopia concluded that women were more likely to receive postnatal services if they lived in an urban area (Berhe et al., 2019; Gebrehiwot et al., 2020). With increased time spent on travel and waiting to receive services, there was an 8.48 times higher likelihood of reduced utilizing postpartum care in Nepal (Khadka et al., 2017). The influence of postpartum care on the number of pregnancies a woman has had has been poorly studied, and results from existing studies are incompatible. However, a few previous studies suggest that the mothers attending four or more antenatal care visits were more likely to attend postnatal care (Adane et al., 2020; Berhe et al., 2019; Gebrehiwot et al., 2020; Tesfahun et al., 2014). A community-based study in Southern Ethiopia found that having four or more ANC visits (AOR = .13, 95% CI (.02, .79) was significantly associated with postnatal care service utilization (Abuka Abebo & Jember Tesfaye, 2018).

Due to differences in study design, research participants, and sampling techniques, the results of the current study were not compatible with those of some previous studies. This is a descriptive cross-sectional hospital-based study done in the Chitwan district of Nepal. Percent comparisons are done for descriptive analysis, and the Chi-square test has been used to measure the association between the variables. Therefore, causality cannot be established regarding the risk factors through this study design. Future research might make use of different study designs (i.e., interventional, longitudinal designs) to identify the factors contributing to postpartum care during the fourth stage of labor. Despite these limitations, the present research contributes to a growing body of evidence suggesting the importance of improving the capacity of clinical or nursing staff and hospitals in Nepal and developing countries focused on improving the quality of postpartum care.

Conclusion

The institutional capacity of the Bharatpur Hospital to deliver quality postnatal care based on WHO guidelines is poor. Residence, number of pregnancies, and number of antenatal visits of the women are associated with the level of postpartum care among women during the fourth stage of labor. So, there is an urgent need to develop policies, plans, and programs to enhance the capacity of nurses or clinicians and health institutions to provide postpartum care according to the WHO recommendation guidelines in Nepal. Multiparous, low socioeconomic-status women and those living far away from health institutions should receive more attention in the future.

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