Assessment of Facilities and Health Workers' Readiness to Provide Quality Maternal and Child Health Services in Selected Rural Municipalities of Dolakha District

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ABSTRACT

Background

Nepal faces significant challenges even with improvements in health care accessibility in delivering quality maternal and child services especially in rural regions such as limited personnel, irregular service delivery, and inadequate supplies. This study aims to assess maternal and child health outcomes in rural Dolakha District by identifying barriers and disparities in maternal and child health care through facility and healthcare providers' assessment.

Objective

To assess the facilities and health workforce readiness to provide quality maternal and child health services in selected Rural Municipalities of Dolakha district.

Method

An institutional based cross sectional descriptive study design was used to collect the data. Total 18 health institutes were taken from selected Rural Municipalities of Dolakha, district of Nepal. Data were gathered from 113 health personnel using minimum services standard (MSS) checklist as well as structured questionnaires. Total enumeration of the samples was done for data collection. SPSS 22 version was used to analyze the data and non-parametric tests were applied to assess the association of socio demographic characteristics and knowledge on maternal and child health (MCH) services.

Result

This study evaluated the quality of services across 18 health facilities, showing a wide range of MSS scores from 56% to 84%. Baiteshwor Hospital had the highest score, while Kavre and Ghangsukhathokar health posts had the lowest. Among the 17 health posts, Malu health post ranked highest at 79%. Significant differences were observed in age groups, with those aged 31–35 achieving the highest mean rank. Gender and work experience had minimal impact. Statistically significant disparities were found in the use of partographs, child health training, and technical assistance, highlighting the need for improved training and supervision to enhance service quality.

Conclusion

This study highlights gaps in healthcare delivery across rural facilities, including shortages in equipment, staffing, and medications. Despite quality improvement committees, infrastructure issues and poor implementation of quality actions hinder service quality. While Baiteshwor Hospital scored well, improvements are needed to enhance maternal and neonatal care and overall healthcare outcomes.

KEY WORDS

Child health, Health facilities, Health workers, Maternal health, Readiness assessment

INTRODUCTION

In the health sector, readiness and availability is the capability to deliver essential services by assessing the quality of healthcare services.[1] The minimum service standard tools were created to guarantee the proper equipping and provision of essential healthcare services ensuring effective operational setting and sufficient resources healthcare facilities.[2,3] Despite the transformation of the healthcare delivery system from a centrally administered kingdom to a federal structure, there is a gap in evidence on the health sector's ability and readiness to provide maternal and child health services.[4]

The global priority program MCH is a crucial public health component, with low-income nations experiencing an 18 times higher child mortality rate than high-income ones.[5] Global maternal death rates remained steady from 2016 to 2022.[6]

Nepal faces challenges in improving care quality due to limited human resources, unclear monitoring, and limited training and accountability mechanisms despite decentralization of health care resulting from political changes.[7] This hinders health facility readiness, maternal health services, and basic emergency obstetric and neonatal care services and still there is potential barriers to reduce maternal mortality ratio (MMR) and neonatal mortality rate (NMR), as a result, Nepal's infant death rate has not decreased in six years as well as there has been slow maternal mortality reduction.[8] Nepal's maternity and perinatal death surveillance shows high postpartum maternal deaths, with 48% occurring within 48 hours, but access to quality care remains challenging, particularly for rural women.[9] Thus, the aim of the study is to assess the facility and health workers' readiness to deliver quality maternal and child health services.

METHODS

This study employs a quantitative research method with an institution-based cross-sectional descriptive study design, with data collection from 4th June, 2024, to 3rd July, 2024, to find out the readiness of health facilities and health workers. Among nine municipalities of Dolakha district, three (Tamakoshi, Baiteshwor, and Melung) rural municipalities were selected using purposive sampling. All 18 health facilities were taken, where one is a municipal hospital, and 17 are health posts, and 113 health workers delivering health services were included from the respective institutions to gather the data. Complete enumeration was used for data collection. The permission was obtained from the selected rural municipalities of Dolakha district, and the health institutes, and ethical clearance was obtained from Nobel College (Ref. no.: 080/81/320)

Based on the research question, this study identified two outcome variables, readiness of facilities which was evaluated through observation of infrastructure, equipment's supplies and medicine and readiness of workforce was measured by assessing knowledge on MCH through self-administered questionnaire (computed in score). The independent variables included socio-demographic characteristics and capacity development. The MSS checklist provided by the Nepal Government was used in this research investigation to assess the readiness of health facilities with respect to maternal and child health (Immunization and Growth Monitoring, Antenatal Checkup and Post Natal Checkup services, birthing center and laboratory services) which included the three components Section I: Governance and Management, Section II: Clinical Service Management Standards, section III: Health Post Support Services Management with their sub-sections. After evaluating the three sections of standards by coding one for available and functional and zero for not available and non-functional, following that average percentage of each standard was calculated by dividing total obtained score by the total standards of each subsection given and multiplying by 100% (percentage = obtained score/ total standard*100). The total average percentage or obtained score for each section was calculated. Thereafter, all sections ware weighted as given in MSS checklist (section I is weighed in 20%, section II is weighed in 60% and section III is weighed in 20%) and then overall MSS score was calculated (0.2 X SectionI + 0.6 X Section II + 0.2 X Section III) % to know readiness of facilities in percentage.[10] A pilot test had been successfully conducted within a representative sample of health posts which were already in use by the Ministry of Health and Population (MoHP) Nepal. Further, The MSS Color Coding system classifies health facilities based on performance levels to ensure service quality. Green (85-100) represents excellent performance, indicating high service standards. Blue (75-84) signifies good performance, showing a need for some improvements. Yellow (50-70) highlights facilities that require significant enhancements to meet the required standards. White (< 50) indicates critical performance, where urgent interventions are necessary to improve service delivery. This system helps prioritize support and resource allocation for better healthcare services. The self-administered structured questionnaires were used to evaluate the workforce's readiness to provide quality of maternal and child health services.[2] SPSS 22 version was used to analyze the data and chi-square test was applied to find out the association between socio demographic characteristics, capacity building and knowledge on MCH with a significance level of 5%.

RESULTS

The total MSS score ranges from a high of 84% to a low of 56% showing wide variance in services quality among health post. It is noticeable that highest score was obtained by Baiteshwor hospital having 84% which is located in

Baiteshwor Rural Municipality, as it is the only hospital out of 18 health facilities. Turning to the detail among 18 health institutes there were 17 Health posts. Malu Health post was at the top of the list with maximum score of 79% followed by Chyama with 78% and Bhirkot was in fourth place by 77% respectively. On the other hand, it can be seen that Kavre health post of Baiteshwor Rural Municipality acquired lowest score 56% and Ghangsukhathokar health post of Melung Rural Municipality at 59%. However, the score of Namdu health post form Baiteshwor Rural municipality and Melung health post from Melung Rural municipality were equal at 69%. Also, Chyama health post of Tamakoshi Rural Municipality and Powati health post from Melung Rural municipality were equal at 73% (Table 1).

Table 1. Facility Readiness based on MSS scoring

Health Post	MSS Score (%)	Health Post	MSS Score (%)
Baiteshwor Hospital	84	Malu	79
Chyama	78	Bhirkot	77
Jhape	74	Hanwa	73
Powati	73	Jhule	72
Sahare	70	Melung	69
Namdu	69	Kshetrapa	68
Bhetpu	63	Gairimudhi	62
Mirge	61	Dadakharaka	60
Ghangsukhathokar	59	Kavre	56

Age categories showed a significant difference (p = .031), with the age group of 31–35 achieving the highest mean rank (72.38). There were no statistically significant differences by gender (p = .943) since the mean rankings of the male and female participants were almost equal (56.73 and 57.17, respectively). Similarly, there were no statistically significant variations in the number of years of work experience (p = .404), but the group of respondents with two to five years of experience had the highest mean rank (62.38). There were highly significant differences in positions within the organization (p = .000), with Registered Nurses (RN) having the highest mean rank (73.75), closely followed by Senior CMA/CMA (66.80). Conversely, Administrative Officers and the category labeled "Others" registered markedly lower mean ranks of 3.50 and 8.14, respectively. These findings underscore age and position as pivotal determinants, while gender and work experience appear to exert minimal influence on the analyzed outcomes (Table 2).

Three areas were shown to have statistically significant disparities: using the partograph (p = 0.026), receiving child health-related pre- and in-service training (p = 0.043), and obtaining technical assistance or supervision at work (p = 0.002). These findings highlight significant variations among individuals according to their assistance or training. However, there were no significant differences (p > 0.05) in other factors, such as advanced skill-birth attendant training, delivery/postnatal care (PNC), and training related to prenatal care (ANC) (Table 3).

Table 2. Preparedness in Relation to Socio-Demographic Characteristics

Variable	Group Rank	n	Median (Min-Max)**	Mean Rank	p-value
Age	18-25	42	32.00 (11 – 36)	64.44	.031*
	26-30	34	29.50 (9 – 36)	43.78	
	31-35	12	33.00 (25 – 36)	72.38	
	36-40	7	32.00 (14 – 34)	58.71	
	> 40	18	30.50 (13 – 36)	53.69	
Gender	Male	44	31.00 (11 – 36)	56.73	.943
	Female	69	32.00 (9 – 36)	57.17	
Years of work experience	Up to 1 year	15	30.00 (11 – 36)	49.93	.404
	2-5 year	52	32.00 (9 – 36)	62.38	
	6-10 year	22	30.50 (18 – 34)	51.05	
	Above 10 years	24	31.00 (13 – 36)	55.21	
Position	Doctor	3	28.00 (22 – 32)	37.50	<.0001*
	Health Assistance	15	31.00 (14 – 36)	63.00	
	Sr CMA/ CMA	35	32.00 (24 – 36)	66.80	
	Nurse (RN)	6	32.50 (30 – 35)	73.75	
	Sr. ANM/ ANM	42	32.00 (18 – 36)	59.76	
	Administrative Officer	1	36.00 (36 – 36)	3.50	
	Other Personnel	11	15.00 (9 – 24)	8.14	

**Data presented as Median (Minimum – Maximum); * p-value computed from Man Whitney U test or Kruskal Wallis Test where applicable and significant at 95% CI

DISCUSSIONS

The Baiteshwor hospital is in top rank with 84% as they provide most of the emergency medicine and other equipment to deliver services like ANC, delivery as mentioned in the MSS guideline. This finding indicates relatively better readiness of the facility to provide maternal and newborn services according to the national MSS framework.[2,10,14,15] According to the annual report, the Bhaktapur District Hospital in the Bagmati Province achieved the highest MSS score of 97% in the fiscal year 2079/80, surpassing the top scorers across all provinces.[8] Similar findings regarding better service readiness among higher-level facilities have also been reported in national and international studies.[1,7,16,18] Adding on the quality management, all the facilities had formed quality improvement committee and regular meeting was held in every month to share the data, in contrast to this, similar study reveals that one-fifth of the medical institutions did not hold regular monthly meetings.[4] Regular quality improvement meetings are considered essential for strengthening service delivery,

Table 3. Preparedness in Relation to Capacity Development

Variable	Rank Group	n	Median (Min-Max)**	Mean Rank	Test Statistics (U)	p-value
Received any pre-service or in-service training related to ANC	Yes	34	32(23-36)	64.34	1092.50	0.116
	No	79	31(9-36)	53.83		
Received any pre-service and in-service training related to delivery and PNC	Yes	40	31.5 (23-36)	62.84	1226.50	0.160
	No	73	31 (9-36)	53.80		
Uses partograph	Yes	54	32 (14-36)	64.13	1208	0.026*
	No	59	30 (9-36)	50.47		
Receive advanced stillbirth attendants training	Yes	16	32 (28-36)	66.72	620.50	0.199
	No	97	31 (9-36)	55.40		
Receive any pre-service and in-service training related to child health	Yes	34	32 (23-36)	66.46	1021.50	0.043*
	No	79	31 (9-36)	52.93		
Receive technical support or supervision in your work at this facility	Yes	78	32 (9-36)	78	874.50	0.002*
	No	35	29 (13-35)	35		

**Data presented as Median (Minimum - Maximum); *p - value computed from Man Whitney U Test and statistically significant at 95% CI.

accountability, and monitoring of maternal and neonatal healthcare services.[11,14,15] However, most of the facilities didn't implement the specific activities based on gap analysis through quality improvement tool. Also, similar study shows nearly all of the facilities (80%) did not carry out regular quality assurance actions.[4] This suggests that although organizational structures existed, effective implementation of quality improvement interventions remained limited.[11,15]

All health facilities were connected to roads, but only four out of the 18 institutes had their own ambulances. The remaining facilities lacked transportation but met the Ministry of Health and Population (MoHP) staffing criteria outlined in the health post organogram provided in the MSS guidelines. Limited transportation and referral mechanisms may delay timely emergency obstetric and neonatal care services in rural settings.[11,13,22,29] A study conducted in rural southern Nepal revealed that all the facilities lacking full staffing faced significant challenges in service delivery.[11] Similarly, a study conducted in Bondowoso, Indonesia, highlighted the shortage of workers in key departments such as pharmacy, nutrition, laundry, and radiology. It also pointed to the low level of human resources, particularly the lack of experienced ICU nurses and untrained professionals in infection prevention and control.[12] This mirrors the challenges faced by health facilities in rural southern Nepal, where staffing shortages, particularly in specialized areas, impact the overall quality of healthcare services. Comparable studies from Nepal have also identified shortages of trained health workers and skilled birth attendants as major barriers to quality maternal and newborn healthcare delivery.[7,16,19,27]

The majority of health facilities did not provide laboratory services and reported referring patients to higher centers or nearby facilities where such services were available. Limited laboratory readiness may compromise early diagnosis and timely management of maternal and neonatal complications.[11,14,16] In addition, biohazard signs and symbols were not prominently displayed in areas where laboratory services existed. While some basic laboratory tests were conducted, such as blood grouping, blood sugar, hemoglobin percentage (HB%), routine urine and pregnancy tests, stool analysis, and protein and urea tests, several essential items were missing. Notably, all health posts lacked K-39 RDTs and microscopes for malaria detection, as outlined in the Minimum Service Standard (MSS) guidelines.[2,10] Additionally, the absence of blotting paper meant that dried blood spot tests could not be carried out, and the necessary test cards were also unavailable. Tetanus toxoid vaccine and iron/folic acid were widely available but Vitamin A were out of stock in three health facilities. A similar study found that iron/folic acid tablets were out of stock in 14 health facilities, including the district hospital, primarily due to a nationwide supply shortage and delayed distribution by the Ministry of Health and Population (MoHP).[11] Previous studies have similarly documented frequent stock-outs of essential medicines and diagnostic supplies in rural healthcare facilities of Nepal.[16,23] Additionally, strips for testing proteinuria (used for pre-eclampsia screening) were unavailable in two out of five PHCCs. Furthermore, three-fifths of the health institutes lacked the required three-color-coded dustbins in the ANC rooms, as per the guidelines. Nearly half of the facilities had a table calendar in the room.[11] Inadequate infection prevention and waste management practices may increase the risk of healthcare-associated infections and compromise patient safety.[11,14,15]

In a recent study, all health facilities were equipped with birthing centers that provide round-the-clock delivery services, staffed by SBA-trained ANMs or staff nurses. However, only one facility had a KMC chair available for premature and preterm babies, while the other facilities used plastic chairs for these babies. This reflects gaps in newborn supportive care infrastructure despite the availability of delivery services.[7,13,11] Out of the 18 facilities, two did not have a separate storage cupboard for delivery service-related logistics. Additionally, less than half of the facilities lacked separate toilets for patients after delivery, with the existing toilets being located near the delivery rooms. Post exposure prophylaxis with nevirapine for

new born was not available. Almost all the facilities had separate placenta bowls; however, four facilities did not have a dedicated bowl for placenta disposal. Among these four, two facilities also lacked a placenta pit for proper disposal. Out of the two facilities without a placenta pit, one health post sends the placenta home with the patient, while the other disposes of it at the old location of the health post. Improper placenta disposal practices may increase environmental contamination and infection risks.[14,15] Three-fifths of the health facilities lacked a clean surface for alternative delivery positions. Most facilities had a resuscitation table, with only three exceptions, and five facilities lacked a room thermometer. Nearly half of the health posts faced a shortage of refrigerators in the labor room, particularly for the storage of oxytocin. However, all facilities had sterile delivery instruments, suture sets, and episiotomy sets, as outlined in the guidelines, ensuring hygienic and safe childbirth practices. Similar research analyzing data from the 2015 Nepal Health Facility Survey revealed that most institutions (96.3%) had at least one bed specifically set aside for safe delivery, with sterile gloves (92.5%) and sterilizing equipment (92.9%) ranking second and third, respectively.[9] This aligns with the recent findings, where all facilities were reported to have sterile delivery instruments, suture sets, and episiotomy sets in place, ensuring adherence to hygienic and safe childbirth practices as per the guidelines.[9,16,25]

The study found one health facility with a 33% shortage in medicine and supplies due to delays by the rural municipality. However, all facilities had PPH and eclampsia management sets, ensuring preparedness for emergencies. Availability of emergency obstetric care sets indicates partial readiness for managing maternal complications.[13,22,29] Three facilities lacked magnesium sulfate for preeclampsia, two lacked oxytocin, and eight lacked atropines. All facilities also faced shortages of dopamine, noradrenaline, digoxin, verapamil, and amiodarone. Two facilities had no oxytocin, with one having expired stock and the other lacking it entirely. Such shortages of lifesaving medicines may contribute to preventable maternal and neonatal morbidity and mortality.[5,6,11,13] In a similar study, all facilities were equipped to provide oxytocin, but less than two-thirds had injectable ampicillin or gentamycin.[11] Consistent with these findings, the majority of health workers at all facility levels expressed the need for more drugs and supplies to improve service quality.[11,23] In another study, 25 institutions, including BEmONC and birthing centers, were found to lack essential medications such as magnesium sulfate and oxytocin, which are critical for treating pre-eclampsia, labor, and postpartum hemorrhage.[4,13]

All facilities had 75% water supply, except one health post where the stored water in the tank was insufficient to cover two full days of interruptions. One health facility had the highest score (67%) for power systems, with an alternative generator and solar power. Twelve facilities scored 33%, while five had no alternative power sources and received no score. Reliable water and electricity supply are essential components of health facility readiness and quality maternal healthcare delivery.[11,14,15] In a similar study on health facility preparedness for maternal and neonatal health services, all healthcare facilities were equipped with energy infrastructure (solar, generator, or direct power), soap and water, garbage bins, and closed sharp containers, aligning with the findings that most facilities had alternative power sources and adequate water supply infrastructure.[13,16]

One facility scored 100% in medical and logistics stores, six scored 80%, seven scored 60%, and four scored 40%, with gaps like missing wheelchairs and functional landline phones. Most facilities lacked three-color-coded dustbins, proper waste management, and a separate laundry room. Only two had washing machines, and five lacked a sterilization room for instruments. These findings indicate persistent gaps in logistics management and infection prevention practices despite implementation of MSS guidelines.[2,10,14,15,30] Improvement in logistics management, waste disposal systems, and sterilization capacity is necessary to strengthen overall healthcare service readiness and quality of care.[15,20,26]

This study was limited to three rural municipalities of Dolakha district; therefore, the findings may not be generalizable to all health facilities in Nepal. The cross-sectional design assessed facility and workforce readiness at a single point in time and could not capture changes over time. Additionally, workforce readiness was measured using a self-administered questionnaire, which may be subject to reporting bias. Despite these limitations, the study provides valuable evidence on the readiness of health facilities and health workers to deliver maternal and child health services in rural settings.

CONCLUSION

This study highlights significant gaps in healthcare service delivery across various health facilities, particularly in rural areas. While many institutions meet some MSS requirements, challenges persist, including shortages in essential equipment, staffing, medications, and supplies. Quality improvement committees were established, but the implementation of gap analysis and quality assurance actions was inadequate. Issues with infrastructure, such as inadequate transportation, power sources, and sanitation, further hinder service quality. Despite some facilities, like Baiteshwor Hospital, achieving high MSS scores, there remains considerable room for improvement. Addressing gaps in staffing, equipment, and infrastructure is crucial to enhancing the quality of maternal and neonatal care, ensuring better healthcare outcomes for the region.

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