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Barriers and Facilitators to Child Growth Monitoring and Promotion Service Utilization in Gorkha District, Nepal: A Qualitative Study

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Abstract

Background

Growth Monitoring and Promotion (GMP) services are critical for the early detection of growth faltering and timely nutritional measures for healthy growth and development. In Nepal, despite the high rate of child malnutrition, GMP utilization remains critically low. This study explored barriers and facilitators to GMP service utilization in Gorkha District, Nepal.

Methods

A qualitative descriptive study was conducted across six municipalities of Gorkha District from December 2023 to May 2024. Three focus group discussions were held with 28 mothers of children aged 24–35 months, and six key informant interviews with healthcare providers. Data were audio-recorded, transcribed verbatim in Nepali, translated to English, and analyzed using Braun and Clarke's six-phase thematic analysis framework, combining inductive and deductive coding. Thematic saturation guided final sample size.

Results

Barriers to GMP utilization operated at individual, community, and health system levels. Major barriers included competing household and agricultural responsibilities, geographical inaccessibility with walking distances of 4–5 hours, knowledge gaps about GMP importance, and health system constraints including understaffing, equipment shortages, and prioritization of curative over preventive services. Healthcare providers further identified inadequate GMP-specific training as a critical gap. Key facilitators included positive maternal attitudes, community support groups, structured follow-up by Female Community Health Volunteers (FCHVs), and integration of GMP with immunization and nutrition services.

Conclusions

GMP underutilization stems from multiple interconnected geographical, individual, and health system barriers. Strengthening peripheral health infrastructure and FCHV-led community outreach, adapting service delivery to agricultural calendars and seasonal terrain constraints, and systematically integrating GMP with immunization services represent the most feasible pathways to improved uptake. These findings complement existing quantitative evidence and provide the contextual understanding needed to design effective, locally appropriate interventions.

Background

Childhood malnutrition remains a significant public health challenge globally, particularly in low- and middle-income countries (LMICs) where early nutritional interventions during the first 1000 days of life are critical to preventing irreversible consequences for child growth and cognitive development [1].

According to WHO estimates, 149 million children under five years were stunted and 45 million were wasted globally in 2022 [2]. Nepal faces similar challenges, with 25% of children under five suffering from stunting and 8% from wasting [3]. These figures reflect not only nutritional deprivation but also the cumulative effects of poverty, inadequate healthcare access, and limited health literacy in rural communities.

Growth Monitoring and Promotion (GMP) services represent a cornerstone of preventive child health services, designed to identify growth faltering early and enable timely corrective measures. The GMP process involves regular measurement of a child's weight, height, and other anthropometric parameters, along with counseling of caregivers on appropriate nutrition and health practices [4]. In resource-limited settings such as Nepal, where the prevalence of malnutrition is high and access to specialist services is limited, timely growth monitoring at the community level provides a critical safety net for the early detection of undernutrition before it becomes severe [5].

Despite Nepal's national guidelines emphasizing monthly GMP visits for children under two years of age, adherence remains inconsistent [6]. The Nepal Demographic Health Survey (NDHS) 2022 reported that only 45% of children under five years had their weight monitored regularly [3]. In Gorkha District, where this study was conducted, only 5.5% of children had completed the recommended 24 GMP visits according to protocol [7]. These figures, though alarming, reflect broader systemic and contextual realities that quantitative surveys alone cannot fully interpret.

Previous studies have identified factors influencing GMP utilization globally, including maternal education, socioeconomic status, accessibility to health facilities, and quality of available services [8, 9].

A systematic review reported that parental knowledge of child nutrition, distance to facilities, and quality and consistency of GMP services were the strongest predictors of GMP service utilization across multiple LMICs [5]. Studies from Ethiopia [8], Ghana [10], and other sub-Saharan African countries have similarly found that competing household demands and geographical inaccessibility substantially reduce the likelihood of consistent GMP attendance, particularly among women carrying dual burdens of agricultural labor and childcare.

In Nepal's specific context, the mountainous terrain of districts such as Gorkha creates accessibility challenges that are qualitatively different from those in urban or flatland settings, making direct extrapolation from other countries' experiences problematic.

While the quantitative study conducted in this same population documented low utilization rates and their associated sociodemographic predictors [7], the underlying reasons rooted in the lived experiences of mothers, the everyday constraints of rural life, and the practical realities of service delivery require qualitative exploration to be fully understood. Qualitative methods are essential for uncovering the contextual, relational, and systemic dimensions of health behavior that numerical data cannot capture [11]. Understanding these dimensions is a prerequisite for designing interventions that are not only evidence-based but also genuinely feasible and acceptable within the local context.

This study therefore aimed to explore the barriers and facilitators of GMP service utilization in Gorkha District from the perspectives of both service users (mothers of young children) and healthcare providers. The findings are intended to complement the existing quantitative evidence and inform context-sensitive policy and programmatic responses to improve GMP uptake in rural mountainous Nepal.

Methods

Study Design and Rationale

A qualitative descriptive study design was employed to explore the barriers and facilitators of GMP service utilization from the service providers and receiver perspectives. This approach generates rich, contextual data that remain close to participants' own descriptions of their experiences, making it particularly suitable for capturing the nuanced factors underlying health service utilization patterns in rural settings [11]. The study utilized Braun and Clarke's six-phase thematic analysis framework [12], which allowed for both inductive exploration of emerging themes and deductive interrogation of a priori constructs derived from the literature.

Gorkha District was purposefully selected for two reasons. First, it represents the mountainous terrain and accessibility challenges that are characteristic of many rural districts across Gandaki Province specifically, and Nepal more broadly. Second, documented GMP utilization in the district was substantially below the national average [7], indicating a significant opportunity for improvement and making it a relevant site for exploring barriers and facilitators to service utilization.

Study Setting

The study was conducted in six municipalities of Gorkha District, Nepal, between December 2023 and May 2024. These were Bhimsen Thapa Rural Municipality, Gandaki Rural Municipality, Sahidlakhan Rural Municipality, Siranchowk Rural Municipality. Gorkha Municipality and Palungtar Municipality. Gorkha District covers 3,610 km² and has a population of approximately 271,061 (2021 census) with elevations ranging from 228 m to 8,163 m above sea level. The district encompasses both hill and mountainous ecological zones. Healthcare services are delivered through a network of health posts, primary healthcare centers, and district level hospitals. The population is predominantly rural, with subsistence agriculture as the primary livelihood.

The district was selected due to its diverse geographical terrain, documented burden of child undernutrition (stunting prevalence 51.9%) [13] and the documented gap between recommended and actual GMP utilization [7], making it a context where understanding the determinants of service use has direct programmatic relevance.

Study Population and Sampling Strategy

Two distinct participant groups were recruited using purposive sampling to ensure representation of diverse perspectives relevant to GMP service delivery.

Mothers (FGD participants)

Eligible participants were mothers or primary caregivers of children aged 24–35 months who had resided in one of the six study municipalities for at least 12 months and were able to provide voluntary informed consent. Purposive sampling ensured inclusion of mothers with varying GMP attendance patterns (regular, irregular, and non-attendees) and diverse socioeconomic backgrounds.

Healthcare providers (Key Informant Interviews)

Eligible participants were health workers directly involved in GMP service delivery for a minimum of 12 months at health facilities within the study area. Temporary or visiting staff and those not involved in GMP delivery were excluded. Participants represented different facility types (health posts and primary healthcare centers) and professional cadres involved in GMP service provision.

Sample Size Determination

Sample size was guided by the principle of thematic saturation. Preliminary analysis following FGD-1 (n = 9) and FGD-2 (n = 7) identified core thematic content relating to barriers and facilitators. FGD-3 (n = 9) and the first four KIIs confirmed earlier themes with minimal new substantive content. Two additional KIIs (KII-5 and KII-6) were conducted to ensure comprehensive representation of healthcare provider perspectives across facility types, after which complete thematic saturation was confirmed. The final sample comprised 28 mothers across three FGDs and six healthcare providers across individual KIIs.

Data Collection Instruments

Semi-structured interview guides were developed through a systematic process. A comprehensive literature review identified key factors influencing GMP utilization globally and in similar contexts. Content validity was ensured through expert consultation with experienced qualitative researchers.

Guides were pilot-tested with five mothers and one health worker in the adjacent Lamjung District, leading to: simplification of three questions for low-literacy contexts; addition of local agriculture-specific examples; and clarification of two questions on seasonal accessibility. The final mother guide comprised 14 open-ended questions across six domains: GMP knowledge and perceptions; barriers to attendance; facilitating factors; interactions with healthcare providers; systemic and facility-level challenges; and suggestions for improvement. The healthcare providers guide comprised 12 open-ended questions addressing roles in GMP delivery, perceived barriers and facilitators, training and equipment challenges, and recommendations for strengthening services. Both interview guides were developed

specifically for this study and are provided in full as additional File 1 (English language versions of the FGD guide for mothers and KII guide for healthcare providers.)

Data Collection Procedures

Data were collected through two complementary methods from December 2023 to May 2024 to capture comprehensive perspectives from different stakeholder groups.

Focus Group Discussions (FGDs) with Mothers

Three FGDs were held with 8–10 participants each (total n = 28). Venues were selected based on community accessibility and comfort. Participants were recruited through health facility networks and FCHVs using purposive sampling. Each session lasted 60–90 minutes and was facilitated by trained Nepali-speaking female researchers fluent in local dialects. A co-facilitator maintained detailed observational field notes.

Key Informant Interviews (KIIs) with Healthcare Providers

Six individual KIIs were conducted at participants' health facilities during mutually convenient times. Each interview lasted 30–45 minutes. Participants represented different cadres and facility types across the six study municipalities. All sessions were audio-recorded with explicit prior consent. The principal investigator (JPU) oversaw all data collection with support from two trained female research assistants. Field notes captured non-verbal communication, interaction dynamics, and contextual factors that audio recordings alone could not convey.

Data Management and Analysis

Audio recordings were transcribed verbatim in Nepali within 48 hours of each session. Bilingual team members independently translated all transcripts into English; a 20% random sample underwent back-translation to verify accuracy, with discrepancies resolved through consensus. Data were de-identified using alphanumeric codes (FGD-1 to FGD-3; participants as FGD-1, P1 to FGD-3, P9; providers as KII-1 to KII-6) and stored on password-protected devices.

Thematic analysis followed Braun and Clarke's six-phase process [12]. Phase I: repeated reading of all transcripts and field notes for deep familiarization. Phase II: line-by-line inductive and deductive coding to identify barriers, facilitators, and contextual factors. Phase III: clustering of codes into candidate themes and sub-themes at individual, community, and health system levels. Phase IV: systematic review and refinement of themes through team discussion and consensus building, with independent verification that coded data corresponded appropriately to each theme. Phase V: clear definition and labeling of final themes as barriers or facilitators. Phase VI: selection of representative quotations and analytical narrative construction integrated with relevant literature.

Quality Assurance

Trustworthiness was ensured using Lincoln and Guba's criteria [12]. Credibility was strengthened through member checking with five purposively selected participants who reviewed preliminary findings and confirmed thematic accuracy. Dependability was ensured through comprehensive documentation of the analytical process, including evolution of the coding framework and rationales for thematic decisions, creating a clear audit trail from raw data to conclusions. Confirmability was enhanced by peer debriefing with two external qualitative research experts from Pokhara University, Department of Public Health who were not involved in the study. Transferability was supported through thick description of the research setting, community characteristics, and participant demographics to enable assessment of applicability to similar contexts.

Inter-coder reliability was established between JPU and DPP, who independently coded the first three transcripts using the preliminary coding framework. Disagreements were discussed and resolved before proceeding. DPP independently coded a random 20% sample of subsequent transcripts to monitor for coding drift throughout the analysis.

Researcher Positionality

The research team comprised public health professionals with experience in child nutrition programs, which could introduce assumptions about service delivery priorities. Potential biases were addressed through regular team reflexivity meetings, peer debriefing sessions, and reflexive journaling throughout data collection and analysis. The team approached participant experiences with deliberate openness to perspectives that might challenge programmatic assumptions.

Findings

Participant Characteristics

A total of 26 mothers participated across three FGD (FGD-1: n = 9, FGD-2: n = 8, FGD-3: n = 9), with a mean age of 27.16 years (range: 19–35 years). All participants were primary caregivers of children aged 24–35 months, residing in the study municipalities for at least 12 months. Six healthcare workers participated in individual KIIs (KII-1 to KII-6), aged 26–42 years; five were female and one was male, representing different position and facility types within selected municipalities. All the participants provided complete data; no withdrawals occurred. (Table 1 and Table 2)

Table 1
Characteristics of focus group discussion participants

Focus Group Discussion	Participants (n)	Age Range (Completed Years)	Sex
FGD-1	9	22–32	All Female
FGD-2	8	19–31	All Female
FGD-3	9	22–35	All Female
Total	26	19–35	All Female

Table 2
Characteristics of Key Informant interview participants

KII Code	Profession	Age (Completed Year)	Sex	Facility Type
KII-1	Health Worker	42	Female	Primary Health Care Center
KII-2	Health Worker	38	Female	Health Post
KII-3	Health Worker	28	Female	Health Post
KII-4	Health Worker	30	Female	Community Health Unit
KII-5	Health Worker	26	Female	Health Post
KII-6	Health Worker	41	Male	Local Level Health Section

Thematic Overview

All factors influencing GMP service utilization were categorized into two broad themes: barriers and facilitators each with sub-themes spanning individual, community, and health system levels. Thematic saturation was reached following the sixth key informant interview and the third focus group discussion. Participant quotations are presented with identification codes to maintain anonymity.

Theme 1: Barriers to GMP Service Utilization

1.1 Competing Household Responsibilities and Time Constraints

Time constraints related to domestic and agricultural responsibilities emerged as the most frequently cited barrier among mothers. In this predominantly rural, agricultural community, many women carry the dual burden of subsistence farming and primary childcare, making regular monthly visits to health facilities difficult to sustain, particularly during planting and harvesting seasons. Daily wage labor imposed additional financial opportunity costs that further discouraged attendance.

"I have to manage household chores and look after my other children, so I often miss GMP visits. During planting and harvesting seasons, it becomes even more difficult." - (FGD-1, P3, Gorkha)

"Most mothers in our village work in fields. Taking time off for health visits means losing daily wages, which many families cannot afford." - (FGD-2, P8, Gorkha)

Healthcare providers corroborated these constraints, noting that even when mothers did attend, competing pressures reduced the time available for meaningful nutritional counselling.

"Mothers are overwhelmed with work. When they come to the facility, they are often in a hurry to return home, making quality counseling difficult." - (KII-1, Health Worker, Gorkha)

1.2 Geographical and Logistical Challenges

Geographical inaccessibility was identified as critical barrier, particularly affecting households in remote municipalities. Long walking distances, often 4–5 hours one way, and very poor road conditions and the absence of public transportation made monthly GMP visits practically impossible for many mothers, especially when traveling with a young child. The burden was not uniformly distributed: more remote municipalities faced substantially greater challenges than relatively accessible areas.

Seasonal inaccessibility compounded these difficulties barriers. One mother explained: *"During monsoon season, the stream overflows, and we cannot cross it to reach the health post. This means missing at least 3–4 months of visits every year."* - (FGD-3, P2, Gorkha)

A healthcare provider added: *"Some mothers have to walk for 4–5 hours to reach the nearest health facility, making it impractical for monthly visits, especially with a small child."* - (KII-2, Health Worker, Gorkha)

1.3 Knowledge Gaps and Misconceptions

Limited understanding of GMP's purpose and importance emerged as a significant individual level barrier to service utilization. Many mothers associated GMP exclusively with immunization services and did not recognize the need for regular growth monitoring independent of vaccination schedules. Others believed that a visibly healthy-looking child had no need for routine monitoring, not recognizing the possibility of subclinical or moderate malnutrition.

"I thought growth monitoring was only necessary during vaccination days. I didn't know we needed to come every month until children turn two years." - (FGD-1, P5, Gorkha)

"Some mothers believe that if their child looks physically healthy, there is no need for regular growth monitoring." - (KII-4, Health Worker, Gorkha)

Notably, mothers who lacked understanding of malnutrition's health consequences and the role of growth monitoring in early detection were less likely to prioritize GMP visits when facing competing household demands, suggesting that knowledge gaps translate into lower perceived value of the service.

1.4 Health System Constraints

Multiple systemic factors hindered effective GMP service delivery and service utilization.

Understaffing and Workload

Limited personnel at health facilities restricted the quality and coverage of GMP services. Healthcare workers reported overwhelming workloads that limited their capacity to provide adequate counseling and follow-up.

One health worker stated: *"We are often overwhelmed with other responsibilities, leaving little time for proper GMP counseling. Sometimes one health worker must manage 30–40 patients daily."* -(KII-3, Health Worker, Gorkha)

This workload challenge was compounded by the expectation that limited staff manage multiple health programs simultaneously, reducing the attention devoted to growth monitoring activities.

Lack of Equipment and Training

Shortages of functional weighing scales, height measurement tools, and anthropometric equipment compromised service quality. Healthcare workers also reported insufficient GMP-specific training, particularly in nutrition counselling techniques and growth chart interpretation.

"We don't always have functional equipment, and some staff lack proper GMP training. We need more practical training on counseling techniques." - (KII-5, Health Worker, Gorkha)

Prioritization of Curative over Preventive Services

Healthcare providers emphasized competing priorities between curative and preventive services. Many facilities prioritized treatment of acute conditions over preventive growth monitoring activities. One health worker observed, *"When we have patients with acute conditions waiting, it becomes difficult to allocate sufficient time for preventive services like GMP."* (KII-6, Health Worker, Gorkha)

This structural prioritization reflected systemic pressures and resource constraints that inadvertently deprioritized preventive child health services.

Theme 2: Facilitators of GMP Service Utilization

2.1 Positive Maternal Attitudes and Awareness

Mothers who understood the benefits of GMP demonstrated consistently higher attendance and, importantly, became advocates for GMP participation within their communities. Positive attitudes, when

developed through consistent engagement and education, translated into sustained service utilization and peer influence, creating a multiplier effect beyond the individual level.

One engaged mother described: *"I make sure to take my child for growth monitoring because it helps me track their health. I've learned so much about proper feeding practices."* -(FGD-2, P5, Gorkha)

Another mother who developed awareness through participation stated, *"After attending GMP sessions regularly, I understood its importance and now encourage other mothers in my community to attend."* -(FGD-3, P4, Gorkha)

2.2 Incentive Programs and Community Support

Healthcare providers as effective motivators for consistent GMP participation identified incentive-based approaches, including recognition through certificates and small nutritional packages. Social recognition appeared to be as motivating as material incentives, particularly when acknowledgment was public and linked to community status.

A health worker explained: *"We recognize and reward mothers who complete all GMP visits with certificates and small nutritional packages, which motivates others."* - (KII-2, Health Worker, Gorkha)

Community-level support systems further strengthened participation. Mothers attending collectively in organized groups reported improved attendance and reduced dropout rates, reflecting the role of social networks and peer encouragement in sustaining health-seeking behavior.

One health worker noted: *"In some villages, mothers have formed groups that go together for GMP visits. This group approach has improved attendance."* -(KII-1, Health Worker, Gorkha)

2.3 Effective Follow-Up Mechanisms

Structured follow-up mechanisms led by FCHVs were consistently identified as one of the most impactful facilitators of sustained GMP attendance. Proactive home visits and appointment reminders to mothers who had missed previous sessions reduced dropout and strengthened the perceived relationship between community and health services.

A health worker described: *"Our Female Community Health Volunteers keep records of children who miss appointments and visit their homes. This has reduced the number of dropouts."* - (KII-4, Health Worker, Gorkha)

One mother stated: *"When health workers call to remind us about appointments, it shows they care, and we feel more responsible about attending."* -(FGD-2, P3, Gorkha)

These personal connections and structured follow-up systems strengthened the relationship between service providers and mothers, facilitating improved utilization.

2.4 Integration of GMP with Other Services

Integrating GMP with other valued health services; particularly immunization programs and vitamin A supplementation was identified as one of the most practical facilitators of improved attendance.

A healthcare provider observed: *"When we integrated GMP with immunization services and vitamin A distribution, attendance improved significantly."* -(KII-6, Health Worker, Gorkha)

Mothers confirmed the efficiency benefits: *"I always attend when there are multiple services offered on the same day because it saves time and transportation costs."* -(FGD-1, P7, Gorkha)

Service integration represented a practical approach to addressing logistical barriers while providing comprehensive child health services.

Conceptual Framework: Facilitators and Barriers to Growth Monitoring and Promotion (GMP) Service Utilization

The identified barriers and facilitators operate across interconnected levels—individual, community and health system to influence GMP service utilization (Fig. 1). Knowledge and attitudes regarding GMP importance and scheduling represent individual-level factors; time constraints, work obligations, geographical distance, and community support systems represent the intermediate level; and understaffing, equipment availability, training, and service integration represent health system factors. The dynamic interplay between these levels determines overall GMP service utilization patterns in this mountainous rural setting.

Discussion

This study provides a detailed account of the multi-level barriers and facilitators that shape GMP service utilization in a rural mountainous district of Nepal. The findings broadly align with and extend the existing literature, while surfacing context-specific dimensions that are critical for designing effective local interventions.

The identification of time constraints and competing household responsibilities as significant barriers is consistent with findings from studies in Ethiopia [14], Ghana [10]. However, this study uniquely highlights the seasonal character of these constraints within agricultural communities, where the pressures of planting and harvesting seasons create predictable peaks in non-attendance. This suggests that GMP programs in agricultural settings should consider flexible scheduling including weekend or early morning sessions and reduced-frequency options during peak agricultural seasons, rather than applying uniform monthly schedules without regard for the agricultural calendar.

Geographical inaccessibility emerged as a critical barrier, particularly for communities in remote municipalities. Similar challenges have been documented in other mountainous regions of Nepal [15]

and other LMICs contexts [16]. The distinctiveness of the Gorkha District experience lies in the extremity of the terrain: walking distances of 4–5 hours one way, compounded by seasonal flooding of access routes, create barriers that are qualitatively different from those in urban or accessible rural settings. Unlike flat terrain contexts where transportation options can partially mitigate distance, the mountainous geography of Gorkha requires targeted structural solutions such as mobile growth monitoring teams, community-based weighing programs, or satellite service points closer to remote communities [17]. Knowledge gaps and misconceptions regarding GMP services, particularly the tendency to combine it with immunization services reflect inadequate health communication strategies, consistent with findings from Tanzania [18] and Indonesia [19]. The finding that women with better awareness became community advocates highlights the value of peer-to-peer health promotion as a complement to formal health worker–client education. Community health education strategies that build on existing social networks may be more sustainable and culturally resonant than clinic-based information provision alone.

Health system constraints identified in this study, including understaffing, equipment shortages, training gaps, and structural prioritization of curative services, mirror systemic challenges documented across Nepal's primary healthcare system more broadly [20]. The specificity of GMP-related training deficits and the absence of dedicated GMP staff represent actionable targets for program improvement that go beyond general health system strengthening. The tension between curative and preventive services is a well-recognized challenge in resource-constrained settings, but it points to the need for organizational and policy-level solutions, including protected time for GMP activities and dedicated GMP providers at the health facility level. The identified facilitators offer practical, evidence-informed pathways for intervention. The effectiveness of incentive programs particularly recognition-based approaches such as certificates, aligns with behavior change theory that emphasizes social norms and status as powerful drivers of health behavior [21, 22]. Formalizing and scaling these recognition mechanisms could extend their reach beyond individual health posts. The critical role of FCHVs in sustaining attendance through structured follow-up reinforces the centrality of community health workers in Nepal's health system [22] and suggests that strengthening and formalizing their GMP-related responsibilities could yield significant gains in service utilization.

Service integration combining GMP with immunization, vitamin A supplementation, and other child health services emerged as a particularly pragmatic facilitator that simultaneously addressed time, cost, and transportation barriers. This service bundling strategy has demonstrated effectiveness in diverse settings [23] and deserves systematic, policy-supported implementation across Gorkha District and similar districts in Nepal. Bundling services also reduces the cognitive and logistical burden on mothers, who are already managing multiple competing demands.

Taken together, the findings suggest that improving GMP utilization in rural mountainous Nepal requires a simultaneous response at multiple levels: strengthening health facility infrastructure and workforce capacity; engaging and empowering community structures, including mother groups and FCHVs; adapting service delivery to the realities of local geography and livelihoods; and developing targeted

communication strategies that build genuine understanding of GMP's value. No single intervention is likely to be sufficient; a systems-based, multi-stakeholder approach will be essential.

Strengths and Limitations

The primary strength of this study lies in its inclusive approach, capturing perspectives from both service users and providers, which enables a more complete understanding of the contextual factors shaping GMP utilization. The diversity of municipalities sampled across Gorkha District's varied terrain enhances the representativeness of findings within this setting. The rigorous application of Braun and Clarke's thematic analysis framework, combined with multiple trustworthiness strategies, strengthens confidence in the analytical conclusions.

Several limitations should be noted. As with most qualitative research, findings may not be generalizable beyond similar contexts. Social desirability bias may have influenced participants' responses, particularly regarding their knowledge and attendance practices. While we attempted to mitigate this through rapport building and non-judgmental questioning, its influence cannot be entirely eliminated. Additionally, the perspectives of fathers and other family decision-makers were not included, which might have provided additional insights into household dynamics affecting GMP attendance. Finally, the study did not document the specific municipality of each participant in verbatim quotes, which limits the spatial granularity of interpretations regarding remoteness.

Conclusions

Growth Monitoring and Promotion service utilization in Gorkha District remains suboptimal, constrained by multiple interconnected geographical, individual, and health system barriers. Difficult terrain and long walking distances, competing agricultural and domestic responsibilities, limited understanding of GMP's purpose, and health facility inadequacies including understaffing, equipment shortages, and insufficient GMP-specific training collectively restrict the regularity and quality of service uptake. However, the study identifies several evidence-based facilitators that offer actionable pathways for improvement. Positive maternal awareness, community support groups, structured follow-up mechanisms by FCHVs, and integration of GMP with immunization and nutritional services were consistently associated with better attendance. These facilitators are feasible to strengthen within the existing system and should form the backbone of any programmatic response.

Effective improvement in GMP utilization requires a multi-level, coordinated response. At the health facility level, this means ensuring adequate staffing, functional equipment, and dedicated GMP training for health workers. At the community level, it requires investing in FCHV capacity for outreach and follow-up, scaling up community support groups, and developing context-appropriate health education that builds genuine understanding of GMP's value. At the service delivery level, systematic integration of GMP with immunization, vitamin A, and other child health services should be formalized as policy, not left to facility-level improvisation. For the most remote communities, mobile growth monitoring services

and satellite weighing points are likely necessary to bridge the geographical gap. Future research should evaluate the effectiveness of these recommendations through intervention studies, and should include the perspectives of fathers and other household decision-makers to better understand the full landscape of household dynamics affecting GMP attendance. A comprehensive, multi-stakeholder approach has the potential to substantially improve GMP service utilization and reduce childhood malnutrition in Gorkha District and in similar rural mountainous settings across Nepal.

Abbreviations

FGD: Focus Group Discussion **FCHV:** Female Community Health Volunteer **GMP:** Growth Monitoring and Promotion **KII:** Key Informant Interview **LMIC:** Low- and Middle-Income Country **NDHS:** Nepal Demographic Health Survey **WHO:** World Health Organization

Declarations

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Authors' contributions:

Jagat Prasad Upadhyay (JPU): Conceptualization; Methodology; Data curation; Formal analysis; Investigation (field data collection); Writing – original draft; Writing – review & editing.

Damaru Prasad Paneru (DPP): Conceptualization; Methodology; Formal analysis; Writing – original draft; Writing – review & editing.

Yam Prasad Sharma (YPS): Validation; Resources; Writing – review & editing.

Nava Raj Khadka (NRK): Validation; Resources; Writing – review & editing.

All authors read and approved the final manuscript.

Ethics Approval and Consent to Participate

Ethical approval was obtained from the Institutional Review Committee of Pokhara University (Approval No: 129/2080/81). All procedures involving human participants were conducted in accordance with the ethical standards of the institutional review committee and with the Helsinki Declaration and its comparable ethical standards. Written informed consent was obtained from all participants after explaining the study's purpose, procedures, benefits, and risks. Confidentiality was maintained by using

codes instead of names during transcription and reporting. Participants were informed of their right to withdraw at any time without consequences.

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Figures

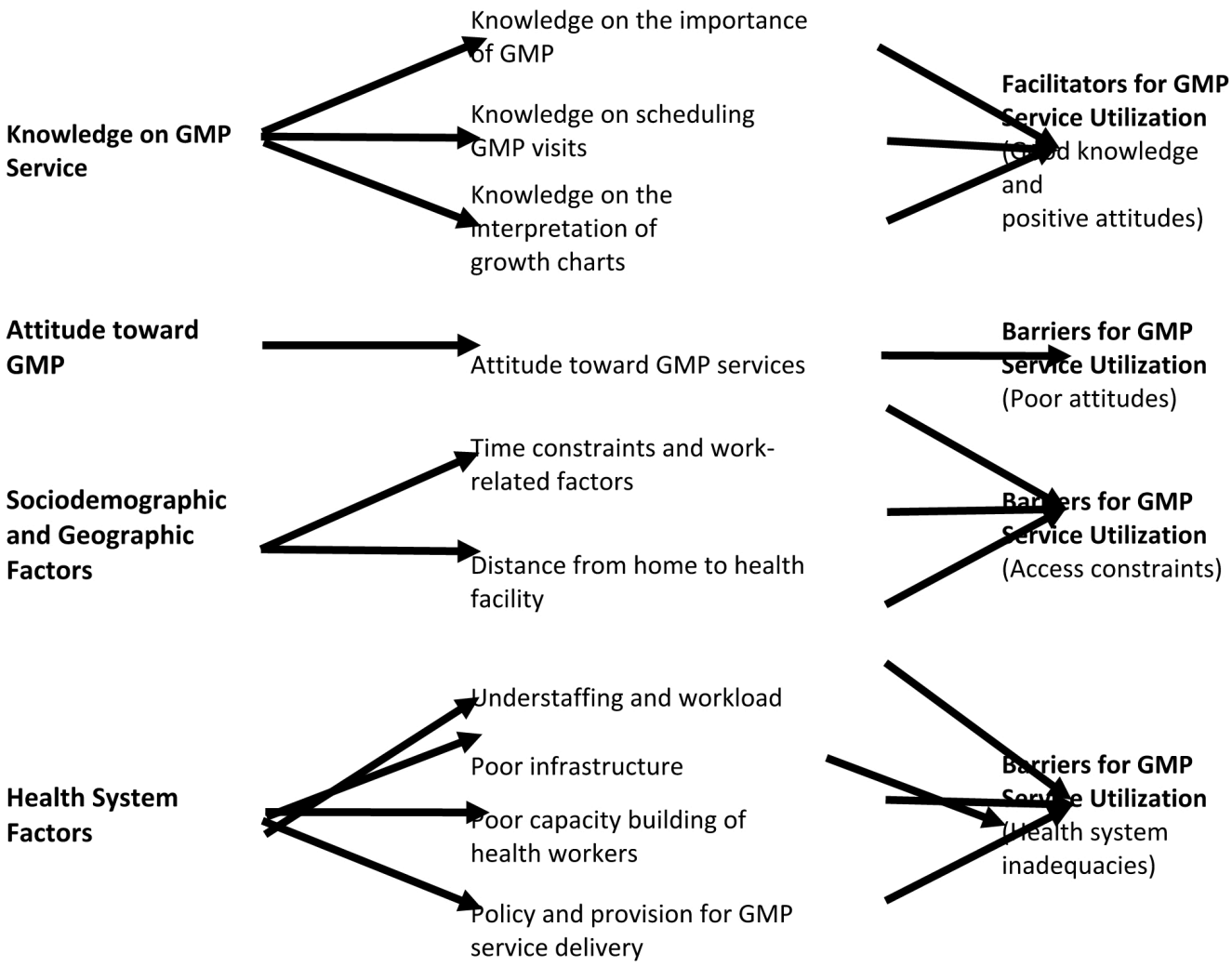


Figure 1

Conceptual Framework on Facilitators and Barriers to GMP Service Utilization

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