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Assessing the Effectiveness of Community Clinics in Maternal and Child Nutrition in Sylhet and Chattogram Divisions, Bangladesh

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ABSTRACT

Despite progress in reducing infant and maternal mortality rates, Bangladesh faces challenges in child nutrition, marked by suboptimal feeding practices and high stunting rates. This study evaluates maternal and child nutrition services in Sylhet and Chattogram divisions to inform strategies for combating malnutrition. Using secondary data from the District Health Information System 2 (DHIS2) spanning January to October 2023, a survey covered 3,179 community clinics. The analysis focused on nutrition services for women and children aged two years and above, including iron and folic acid (IFA) supplementation, weight monitoring, and counseling on exclusive breastfeeding and complementary feeding. 80% of registered pregnant women received maternal nutrition services, with rates of 82% and 79% in Sylhet and Chattogram, respectively. In February 2023, the majority of enrolled children received counseling, but fewer did so in May. Enrollment of pregnant women and children aged two years and above decreased from May to July 2023. Advancements in maternal and child nutrition services are evident in Chattogram and Sylhet divisions, but challenges remain in practitioner training and data reporting. Continuous improvement in healthcare infrastructure and training program is vital for better health outcomes.

INTRODUCTION

Bangladesh has committed to the Sustainable Development Goal 3, aiming to reduce the maternal mortality ratio to below 70 per 100,000 live births and neonatal mortality to fewer than 12 per 1,000 live births by 2030 (MPDSR, 2022). Despite progress, the Maternal and Perinatal Death Surveillance and Response report of 2022 estimated the maternal mortality ratio at 156 per 100,000 live births, and in 2023, infant mortality was reported at 21.556 deaths per 1,000 live births, reflecting a 4.68% decrease from the previous year (MPDSR, 2022). Significant strides have been made in reducing infant and maternal mortality rates, as well as fertility rates, as highlighted by the Health, Population and Nutrition Sector Development Program (BBS, 2019). However, challenges in child nutrition persist, with the Bangladesh Demographic and Health Survey indicating low rates of appropriate infant and young child feeding practices and high levels of stunting among children under five, particularly among the impoverished (DGHS, 2020). To address these issues, the government established the National Nutrition Services (NNS) in 2011, leveraging existing health infrastructure to provide nutrition services to children and pregnant women (MOHFW, 2017). Supported by the World Bank, the Ministry of Health and Family Welfare is

implementing the 4th Health, Population and Nutrition Sector Program (4th HPNSP), focusing on delivering nutrition services in the Sylhet and Chattogram divisions (World Bank, 2021). Community Clinics (CCs), initiated in 1996, play a pivotal role in rural primary healthcare, each serving 6,000 to 10,000 people. These clinics offer iron and folic acid supplements, weight monitoring, and age-specific nutrition counseling for mothers and young children (Nguyen et al., 2017).

Maternal nutrition is crucial for ensuring safe pregnancies and deliveries. Access to services such as weight monitoring, nutrition counseling, and iron and folic acid supplementation is essential for the health of both mother and child (Black et al., 2008; Bhutta et al., 2013). Similarly, exclusive breastfeeding and appropriate complementary feeding for children under two are vital for their development. Undernutrition remains a significant barrier to the developmental potential of children in developing countries and is a direct cause of mortality, contributing to approximately 35% of the nearly 10 million annual deaths of children under five (WHO, 2014). Exclusive breastfeeding is a critical intervention; initiating breastfeeding within the first hour of birth could prevent 20% of newborn deaths (BBS, 2019). Non-breastfed infants are at a higher risk of mortality from pneumonia and diarrhea compared to those exclusively breastfed (Nguyen et al., 2017). Despite overall progress, disparities persist, particularly in regions like the Chattogram and Sylhet divisions, where key nutrition and health indicators lag behind national averages. Stunting, driven by inadequate feeding practices and poor nutrition, remains a serious concern, with prevalence rates of about 50% in Sylhet and 38% in Chattogram (MPDSR, 2022). The government, with both local and international support, has implemented multi-year policies and programs to enhance access to quality nutrition and health services (WHO, 2014). Initiatives like the 4th Health, Population, and Nutrition Sector Program are instrumental in improving the delivery of essential nutrition services. The program prioritizes stimulating demand and improving access to and utilization of health, population, and nutrition services to reduce morbidity and mortality, curb population growth, and enhance the nutritional status of women and children (Machin et al., 2008; Biswas et al., 2020). Capacity-building efforts targeting frontline workers in Sylhet and Chattogram divisions, along with improvements to registration and reporting systems, have led to significant progress. For instance, coverage of maternal nutrition services increased threefold from January 2018 to July 2019, and child nutrition services coverage improved twelvefold during the same period (MPDSR, 2022). Third-party assessments, such as the 2019 evaluation of maternal and child nutrition services in these divisions, play a crucial role in assessing and enhancing service delivery (Haque et al., 2023). This report aims to assess the status of community services for registered pregnant women receiving specified maternal nutrition services and infants and children under two receiving specified nutrition services at community clinics in the designated areas. The assessment focuses on indicators such as the availability of functional weighing scales, supplies of iron and folic acid, and the presence of trained nutrition service providers. The findings highlight successes, such as the high availability of well-functioning weighing scales in Sylhet and adequate maternal and child registers in Chattogram, while also identifying areas for improvement, including the need for consistent availability of iron and folic acid supplies across both divisions.

MATERIALS AND METHODS

The primary data source for this research was the Directorate General of Health Services (DGHS) website, utilizing the DHIS2 individual records system. This online database has provided comprehensive information on maternal and child health services,

including nutrition services, in community clinics across Sylhet and Chattogram divisions, Bangladesh.

Data collection was conducted electronically, accessing the DHIS2 individual records system via the DGHS website. Community healthcare providers (CHCPs) input data into the system using laptops from the respective community clinics. Maternal data was extracted from the maternal health system module within DHIS2, focusing on the total number of enrolled pregnant women and the provision of maternal nutrition services, including weight monitoring, iron-folic acid (IFA) supplementation, and counseling sessions. Child data was extracted from the child health system module within DHIS2, focusing on the total number of enrolled children under 2 years old and the provision of appropriate counseling services. Specifically, for children aged 0-23 months, data was collected on the number of children who received age-specific counseling on exclusive breastfeeding and complementary feeding practices.

The collected data was analyzed to assess the coverage and quality of maternal and child nutrition services in community clinics during the study period. Descriptive statistics, such as frequencies and percentages, were computed to summaries the extent of service provision and utilization. Comparative analyses were conducted to identify any variations in service coverage between different geographic areas or demographic groups. Data on maternal and child nutrition services were cross-tabulated to explore associations and trends over time. Ethical approval for the use of secondary data was obtained from DIU ethics committees as per institutional guidelines. Reference for secondary data is District Health Information System 2 (DHIS2).

Sample size calculation (Machin D, 2011), For calculation of sample size for the target population, we estimated the proportion of registered pregnant women receiving maternal nutrition services and the proportion of registered children under 2 years receiving appropriate counseling.

The formula can be expressed as n =

$$n = N * [Z^2 * p * (1-p)/e^2] / [N - 1 + (Z^2 * p * (1-p)/ e^2]$$

Each variable has been calculated for the sample sizes required for both groups separately [14]. These sample sizes represent the number of pregnant women and children under 2 years needed to estimate the proportions of interest with the desired level of confidence and precision. The total number of registered pregnant women and the total number of registered children under 2 years at community clinics in the two divisions were derived from 3,179 community clinics in the Chattogram and Sylhet divisions, respectively. This study on maternal and child nutrition services at community clinics in the Sylhet and Chattogram divisions of Bangladesh was conducted using secondary data from the District Health Information System 2 (DHIS2). All data utilized were anonymized and aggregated, ensuring that no personal identifiers of individuals were disclosed.

Participation in this study did not involve direct contact with individuals, as data were collected electronically by community healthcare providers (CHCPs) and input into the DHIS2 system. Therefore, the requirement for individual informed consent was waived. However, the ethical principles of confidentiality, beneficence, and non-maleficence were strictly adhered to throughout the research process.

RESULTS

In this study, we investigated the percentage of registered pregnant women receiving specified maternal nutrition services including provision of iron-folic acid (IFA) supplementation ≥30, weight monitoring, and nutrition counseling in all community clinics across Chattogram and Sylhet divisions. Additionally, we examined the percentage of registered children under 2 years old receiving specified nutrition services, such as age-specific counseling on exclusive breastfeeding and complementary feeding, in the same community clinics and time period. Necessary data downloaded from the DHIS2 online database. After downloading the data, we performed calculations in Excel as per flow chart (Figure-1).

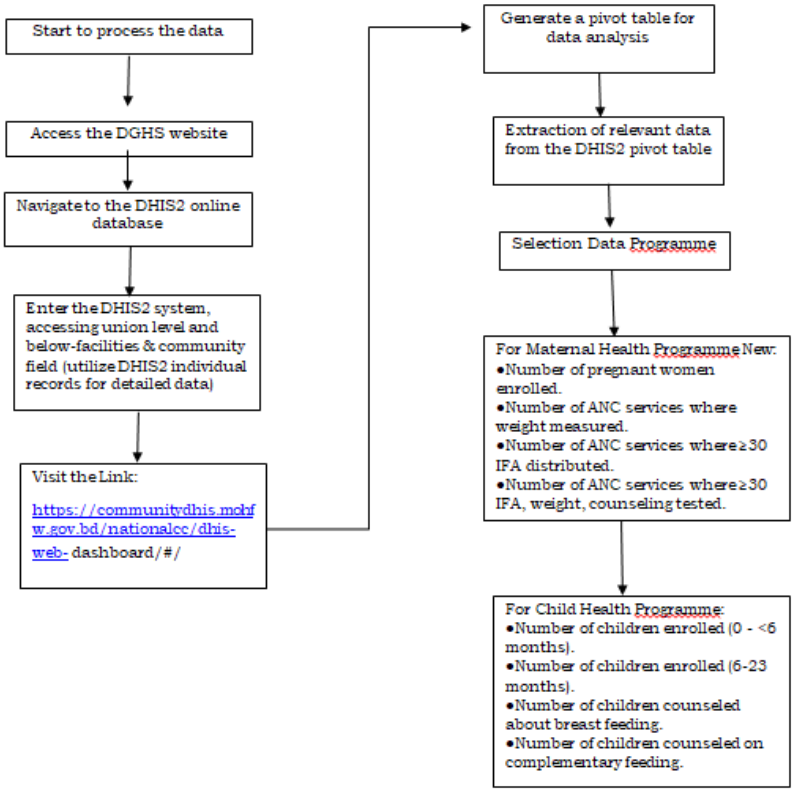

Figure 1. Flow chart of data collection from the DHIS2 system and analysis.

Data shows that 80% of registered pregnant women receive specified maternal nutrition services at community clinics in both divisions combined. Specifically, the cumulative percentages are 82% and 79% in Sylhet and Chattogram division respectively. In Sylhet and Chattogram divisions, during February 2023, the highest number of enrolled pregnant women was 14,362, out of which the majority, 11,424, received all three services (Figure 2).

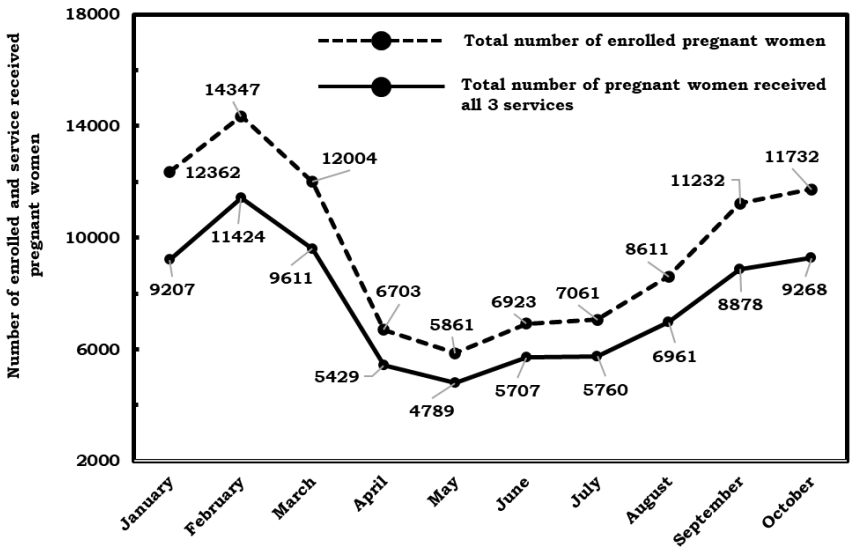

Figure-2. Number of total enrollment and number of enrolled pregnant women serviced all 3 services in Sylhet & Chattogram Divisions during the study from January to October, 2023.

On the other hand, fewer pregnant women were enrolled in May 2023—of them, 5,861 registered—and only 4,789 of them received all three services. In both divisions, 82% of registered pregnant women who were pregnant between May 2023 and June 2023 used the designated maternal nutrition programs (Figure 3).

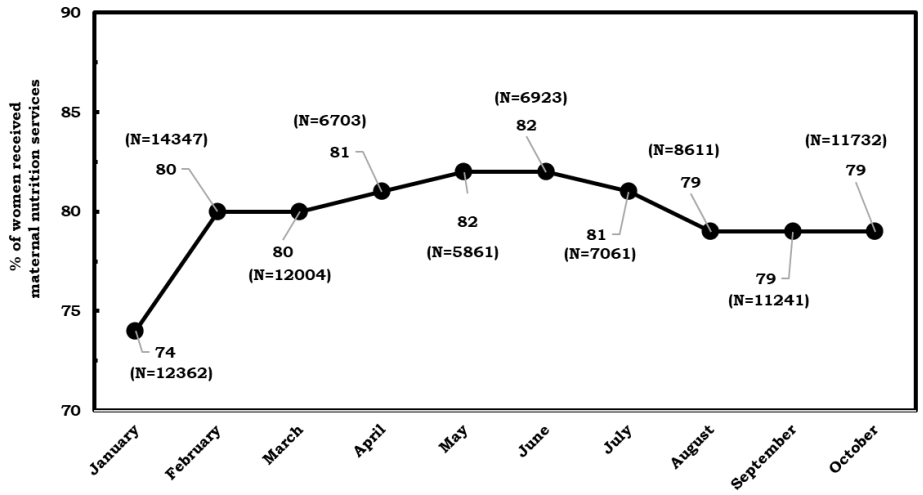

Figure 3: Percentage of registered pregnant women receiving specified maternal nutrition services in Sylhet and Chattogram division (January-October, 2023).

This strong uptake indicates these regions' excellent dedication to maternal health. On the other hand, there was a minor decrease in January, when 74% of registered expectant mothers used these essential services. This still constitutes a sizable fraction of the population needing critical maternal care, notwithstanding the decline. The information emphasizes how crucial it is to keep working to guarantee that maternal nutrition services are widely available, especially during crucial stages of pregnancy, in order to protect the health of expectant mothers and their unborn children. There was a clear difference in the use of specific maternal nutrition services between registered pregnant women in Feni and Bandarban between January and October of 2023. With 89% of registered pregnant women

utilizing these crucial services, Feni showed an amazing dedication to maternal health. This high level of involvement demonstrates a proactive approach to safeguard local expectant mothers. In contrast, the uptake rate for Bandarban was lower; just 64% of registered pregnant women obtained the required maternal nutrition therapies during the same period. This discrepancy highlights the need for targeted interventions and increased public education campaigns to improve maternal health service accessibility and utilization, particularly in underserved places such as Bandarban. Taking everything into account, efforts to reduce this gap are crucial to safeguarding the health outcomes for expectant mothers and their babies.

The data from January to October 2023 reveals significant variations in the provision of appropriate counseling to enrolled children under two years old (U2) in the Sylhet and Chattogram Division (Figure 4).

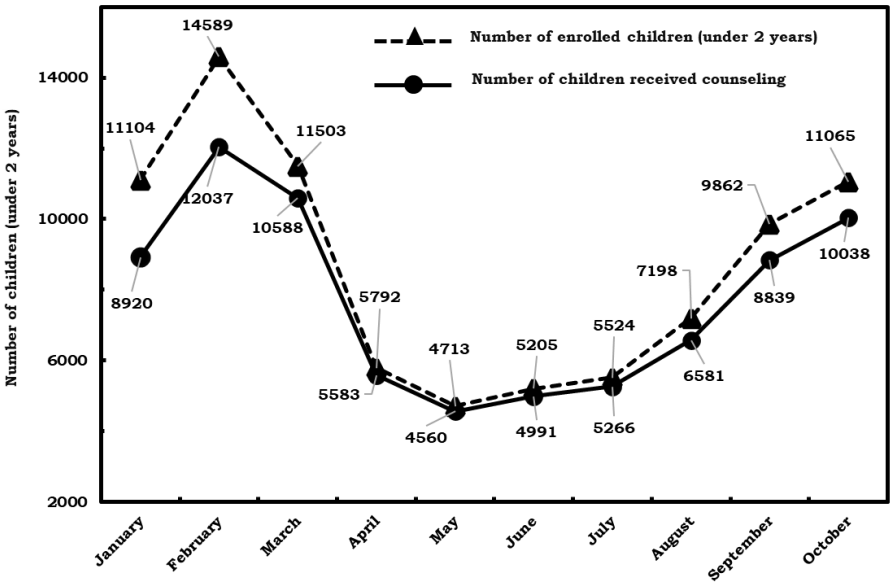

Figure 4. Number of total enrolled Under 2 years children and of them number of children received appropriate counseling in Sylhet and Chattogram Division.

In February, out of a total of 14,589 enrolled U2 children, an impressive 12,331 received the necessary counseling, indicating a robust engagement with healthcare services within these regions. This highlights a commendable effort to ensure that a vast majority of young children receive the vital support and guidance they need for healthy development. On the other hand, May's results show a contrasting picture, with only 4,713 of the U2 youngsters who were enrolled overall benefiting from proper treatment. Even if this is still a sizable amount, the decline from February raises the possibility of difficulties or variations in the services offered at this time. The fact that 4,560 children continued to get counseling in spite of the lower numbers highlights continuous efforts to give early children's wellbeing in Sylhet and Chattogram top priority. The disparity in data between February and May highlights how crucial it is to keep providing children under two with consistent and easily accessible healthcare services all year long. In order to guarantee that all children have equitable access to the critical healthcare interventions necessary for optimal growth and development, it also emphasizes the necessity of conducting additional research into the variables that may influence oscillations in service consumption. The Sylhet and Chattogram Division's registered children between the ages of 0 and 23 months exhibit a good trend in their use of specific child nutrition programs, according to data recorded between January and October 2023. Impressively, 97% of registered children in April and

May received the designated nutrition services, demonstrating a strong commitment to meeting the nutritional needs of young children in these areas. This high degree of participation is indicative of a proactive strategy to protect the health and welfare of the youngest members of society at vital junctures in their development. With 85% of registered children receiving the designated nutrition services in February, the data still shows a significant uptake, albeit slightly lower than the statistics for April and May. This statistic shows that a significant proportion of children are benefiting from critical nutritional treatments during this time, even though it is not as high as it will be in the following months.

Overall, the consistent provision of specified child nutrition services throughout the January to October timeframe underscores a sustained effort to prioritize the nutritional needs of infants and toddlers in Sylhet and Chattogram. The outcome suggests that ongoing initiatives aimed at promoting child health and nutrition are yielding positive outcomes, but continued efforts are essential to maintain and improve upon these achievements. By ensuring widespread access to specified child nutrition services, policymakers and healthcare providers can contribute to better health outcomes and improved developmental trajectories for children in the region.

The collected data from January to October 2023 reveals notable disparities in the provision of child counseling services related to nutrition across different districts in Bangladesh, particularly in Rangamati, Bandarban, and Kagrachari. In Rangamati, an impressive 100% of children aged 0-23 months received counseling services related to nutrition during the specified period. This exemplary achievement underscores a strong commitment to addressing the nutritional needs of infants and toddlers within the district. The full coverage of counseling services suggests that efforts to educate caregivers and provide support for optimal nutrition have been successful in Rangamati, potentially contributing to improved health outcomes among young children. Conversely, in Bandarban, the data indicates a lower uptake of counseling services, with only 63% of children aged 0-23 months receiving such services. While still representing a majority, this lower percentage suggests potential challenges or barriers to accessing nutrition counseling in Bandarban. Identifying and addressing these barriers is crucial to ensuring that all children have equitable access to essential nutrition support and guidance. The data error reported in Kagrachari, where the percentage of children counseled exceeds 100%, highlights the importance of data accuracy and integrity in monitoring and evaluating healthcare services. While it is unclear from the provided information what led to this error, it underscores the need for robust data management practices and quality control mechanisms to ensure the reliability of health data reporting. Overall, the data highlights both successes and challenges in the provision of child counseling services related to nutrition across different districts in Bangladesh. While some districts have achieved full coverage, others face barriers that may hinder access to essential services. Addressing these disparities and improving access to nutrition counseling for all children is essential for promoting optimal health and well-being during early childhood.

The data from January to October 2023 provides insights into the enrollment of children aged 0-23 months in Sylhet and Chattogram Division, highlighting significant variations across different districts, with Cumilla and Brahmanbaria standing out (Figure 5).

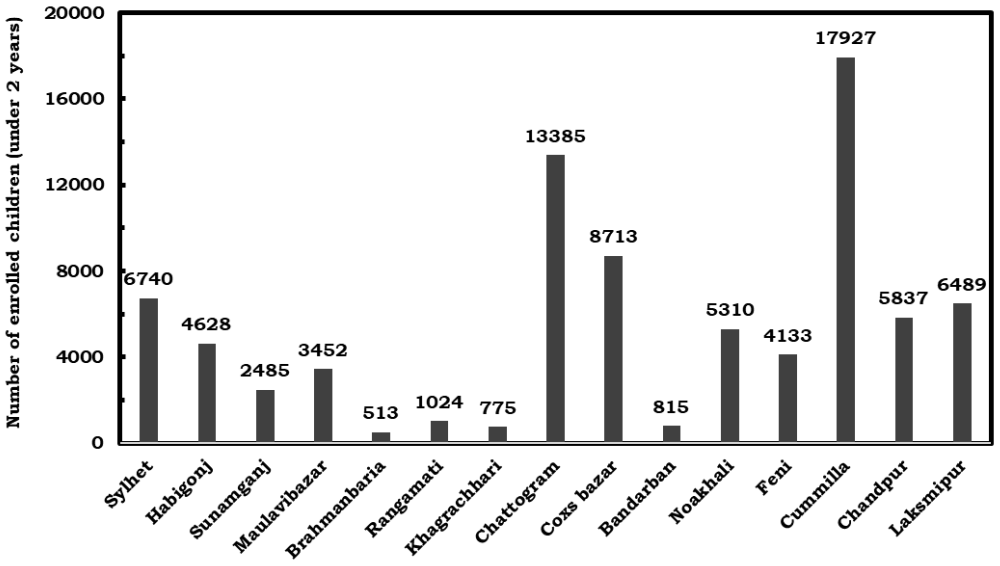

Figure 5: District-wise number of children (0-23 months) enrolled in Sylhet and Chattogram Division

Cumilla has emerged as the district with the highest enrollment in early childhood healthcare services, with 17,927 children aged 0-23 months actively participating. This significant uptake highlights the district's proactive engagement in promoting early healthcare interventions, underscoring the awareness among caregivers of the critical role of timely healthcare access in shaping better health outcomes and developmental milestones for infants and toddlers. Conversely, Brahmanbaria reports the lowest enrollment figures, with only 513 children aged 0-23 months enrolled during the same period. This stark disparity may reflect underlying challenges or barriers to healthcare access, such as limited infrastructure, socioeconomic constraints, or lack of awareness among caregivers. Addressing these barriers through targeted policies, community outreach, and improved healthcare infrastructure could enhance enrollment rates and ensure equitable access to essential medical care for all children in the district. These findings underscore the importance of district-level analyses in understanding patterns of healthcare utilization among children aged 0-23 months. By identifying areas of high and low enrollment, policymakers and healthcare providers can allocate resources more effectively and implement targeted strategies to promote equitable access to early childhood healthcare services. This approach is crucial for improving child health outcomes, reducing regional disparities, and fostering equity in healthcare access for vulnerable populations.

DISCUSSION

The Directorate General of Health Services (DGHS) website data analysis using the DHIS2 individual records system provides a comprehensive overview of mother and child nutrition services in community clinics throughout Bangladesh's Sylhet and Chattogram divisions. The analysis was carried out from January to October 2023. The study discovered that 80% of registered pregnant women received specialized nutrition services, such as IFA supplementation, weight monitoring, and nutrition counseling. Maternal health services are frequently used. It's interesting to note that Sylhet's cumulative percentage of services provided (82%) was slightly greater than Chattogram's (79%), suggesting that regional differences are influenced by factors like community

involvement, local health policies, and healthcare infrastructure. Variations in the number of pregnant women registered in services were found in the monthly research. The greatest numbers of women (14,362) were enrolled in February 2023, and 11,424 of them received all three services. Pregnant women enrolled in May 2023 numbered 5,861, of whom 4,789 received all three services. These variations could be caused by seasonal patterns, public health campaigns that affect the use of services during specific months, or the availability of healthcare professionals. There was a clear distinction between the districts: 89% of registered pregnant women in Feni used maternal nutrition programs, compared to a lower uptake rate of 64% in Bandarban. This gap highlights the need for targeted interventions, such as improving community engagement programs, improving the education of healthcare providers, and resolving logistical problems.

An examination of child nutrition services provided to children younger than two years old indicated a high level of involvement with medical services, especially when it came to age-appropriate counseling regarding exclusive breastfeeding and complementary feeding methods. 12,331 of the 14,589 enrolled children in February 2023 received the required counseling, demonstrating a strong effort to guarantee early childhood nutrition. But in May 2023, out of the 4,560 children enrolled, a significant decrease was noted, with only 4,713 children receiving proper treatment. This decline in service delivery may be the result of things like a lack of employees, problems with the supply chain, or interruptions brought on by outside events such natural catastrophes or political upheaval. The data also showed notable successes in specific areas, such Rangamati, where nutrition counseling services were provided to all children between the ages of 0 and 23 months. This remarkable accomplishment shows the district's unwavering commitment to provide for the nutritional needs of young children and opens the door for other difficult areas to take up and implement Rangamati's successful strategies. However, the uptake of nutrition guidance was lower in Bandarban, where only 63% of youngsters received it. In order to improve child health outcomes in Bandarban, service access barriers must be located and eliminated. Obstacles could include lack of understanding about the importance of nutrition guidance, cultural norms, or geographic challenges. Increasing the infrastructure of healthcare and focusing awareness campaigns could help in these underprivileged areas.

The glaring disparities in service coverage between districts and months underscore the need for a more advanced method of delivering healthcare. Districts with high enrollment and service uptake, such as Cumilla, with 17,927 enrolled children, are examples of proactive approaches to early childhood healthcare. On the other hand, Brahmanbaria had the lowest enrollment (513 kids), suggesting that there might be obstacles in the way of receiving healthcare. To address these disparities, a multimodal strategy involving targeted interventions, community involvement, better policy and infrastructure development, and monitoring and evaluation is required. Strong quality control and data management procedures will guarantee the integrity and correctness of health data reporting, assisting in the identification of gaps and the efficient tracking of advancements. Service coverage can be improved by concentrating on districts with lower service acceptance and addressing unique local barriers with tailored interventions, healthcare provider training, and community outreach activities. Sustainable improvements require strengthening the healthcare system, ensuring a steady supply of necessary resources (such as IFA supplements and counseling materials) to community clinics, involving community leaders and influencers, and raising awareness and educating the public about the value of maternal and child nutrition services through community-based programs and media campaigns. It is imperative to carry out additional investigation to comprehend the variables impacting service consumption and

include feedback procedures to consistently enhance healthcare provision. Policymakers and healthcare professionals can endeavor to guarantee fair access to vital health services for all expectant mothers and young children by tackling these variances with a comprehensive strategy, thereby enhancing health outcomes and developmental trajectories in the area.

CONCLUSION

The study findings underscore the progress made in maternal and child nutrition services at community clinics within the Chattogram and Sylhet divisions. Despite advancements, challenges persist, notably due to some health practitioners lacking experience in delivering quality nutrition therapy services and inadequate online reporting access. However, strides have been taken to enhance nutrition and healthcare coverage rates through targeted maternal and child nutrition program, coupled with improved monitoring and reporting mechanisms. Overall, the findings indicate improvement in maternal and child nutrition services during the period (January-October 2023) through individual tracker systems. To address data-related errors, it is essential to engage with the Management Information System (MIS) for rectification within the DHIS2 system.

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