

# Assessment of Growth Monitoring and Promotion Programme Implementation in Rural Bangladesh

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## Preface

This report summarizes the findings from the study protocol IR 1.1.13, titled “Assessing the effectiveness of strengthening the growth monitoring and promotional activities in rural Bangladesh”. The study has been commissioned with the support of the United States Agency for International Development (USAID) under the terms of USAID’s Research for Decision Makers (RDM) Activity cooperative agreement no. AID-388-A-17-00006.

The Government of Bangladesh (GoB) began implementing the growth monitoring and promotion (GMP) programme in all health facilities, including community clinics (CCs), in 2000, to improve the nutritional status of children. However, the government faced many challenges in implementation primarily attributable to insufficient resources and trained personnel. As such, World Vision Bangladesh (WVB), an international non-governmental organization (INGO), sought to address these challenges by supporting the GoB with an additional health worker to implement GMP services in selected communities and CCs of rural Bangladesh. Therefore, the purpose of this descriptive study is to explore the effects of WVB’s support in the GMP programme in rural Bangladesh.

The study was conducted in 60 Community Clinics (CCs) and their GMP service delivery areas in 6 sub-districts of the Mymensingh division. The Institute of Public Health Nutrition (IPHN) provided technical support to icddr,b in conducting the research and in providing feedback as required. The icddr,b shared the updates of the study with the Technical Interest Group (TIG), a small advisory panel comprising 15-20 members. This group was involved in all stages of the project, including research design, methodology, and the format and manner of communication to participants.

It is important to note that during the programme implementation period in March 2020, the GoB declared a countrywide lockdown to curb the spread of COVID-19. Hence, this study also explored the effect of the COVID-19 lockdown on both GoB and WVB-supported GMP programme implementation.

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## Table of Contents

Acronyms .....	i
Executive Summary .....	ii
<u>1. Background and rationale</u> .....	1
1.2 Study Objectives .....	2
2. Methods .....	3
2.1 Study Design, study site, and timeline .....	3
2.3 GoB's GMP service area description .....	4
2.4 WVB-supported service area description .....	4
2.5 Selection and Recruitment of study participants .....	4
2.5.1 Eligibility Criteria of study participants for assessment .....	4
2.6 Data collection .....	5
2.7 Sample Size .....	5
2.7.1 Quantitative Assessment .....	5
2.7.2 Qualitative interviews .....	6
2.8 Quality control .....	6
2.9 Data Analysis .....	6
2.9.1 Quantitative data analysis .....	6
2.9.2 Qualitative data analysis .....	6
2.10 Ethical Assurance for the Protection of Human Rights .....	7
2.11 Strengths and Limitations .....	7
3. Results .....	8
3.1 Assessment of GMP programme implementation in government areas .....	8
3.1.1 Child weight and length measurement and growth monitoring-specific counseling status .....	8
3.1.2 Mothers/Caregivers' Knowledge, Perception, and Practice of GMP .....	9
3.1.3 Knowledge and practice of community health care provider (CHCP) on GMP service delivery .....	9
3.1.4. Infant and young child feeding (IYCF) practices in the GoB area .....	11
3.2 Assessment of GMP programme implementation in World Vision Bangladesh area .....	13
3.2.3 Knowledge and practice of community health care provider (CHCP) on GMP service delivery .....	16
3.2.4 Knowledge and practice of community promoter (CP) on GMP service delivery .....	17
3.2.5. Infant and young child feeding (IYCF) practices in the WVB area .....	18
3.3 COVID-19 Pandemic's effect on overall health services access and GMP service delivery .....	19
3.3.1 GMP service delivery at CCs by CHCPs in the GoB area .....	19
3.3.2 GMP service delivery at CCs by CHCPs in the WVB area .....	19
3.3.3 The WVB-supported GMP services .....	20
3.3.4 Mothers/Caregivers' Experience and Opinion on GMP service delivery during the pandemic .....	21
3.3.5 Infant and young child feeding (IYCF) practices .....	21
4. Discussion .....	23
5. Bibliography .....	25
Annexure .....	26
Disclaimer .....	35

## **Table of tables**

Table 1. GMP service coverage in GoB area	22
Table 2. Mothers/caregivers' knowledge attitude and practice on GMP programme in GoB area	23
Table 3. Infant and young child feeding practices in the GoB area	24
Table 4. GMP service coverage in the WVB area	25
Table 5. Mothers/caregivers' knowledge attitude and practice on GMP programme in WVB area	27
Table 6. Infant and young child feeding practices in WVB area	28
Table 7. GMP service delivery during pre-COVID-19 and COVID-19-period	29
Table 8. Infant and young child feeding (IYCF) practices during pre-COVID-19 and COVID-19 period	31

## **Table of Figures**

Figure 1. Map of the Mymensingh district with the WVB-supported area and GoB GMP service area	3
Figure 2. GMP status in the GoB area .....	8
Figure 3. Infant and young child feeding practices in the GoB area.....	12
Figure 4. Caregivers interpretation of child nutritional status as per growth chart in WVB area.....	14
Figure 5. Mother/caregivers knowledge of GMP, GMP card and growth chart in the WVB area .....	15

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## Acronyms

Community Clinic	CC
Community-based health care	CBHC
Community-based healthcare provider	CHCP
Coronavirus disease of 2019	COVID-19
Confidence Interval	CI
Exclusive breastfeeding	EBF
Expanded Programme on Immunization	EPI
Family Welfare Assistant	FWA
Government of Bangladesh	GoB
Growth Monitoring and Promotion	GMP
Health Assistant	HA
Household	HH
Infant and Young Child Feeding	IYCF
Knowledge, attitude, and practice	KAP
Length-for-age Z-score	LAZ
Minimum acceptable diet	MAD
Minimum dietary diversity	MDD
Minimum meal frequency	MMF
Mid-upper arm circumference	MUAC
National Nutrition Services	NNS
Operational Plan	OP
Standard Deviation	SD
United States Agency for International Development	USAID
Weight-for-age Z-score	WAZ
Weight-for-length Z-score	WLZ
World Health Organization	WHO
World Vision Bangladesh	WVB

## *Executive Summary*

### **Introduction**

Growth Monitoring and Promotion (GMP) is a preventive activity which comprises growth monitoring linked with promotion (usually counseling) that increases awareness around child growth and caring practices[1]. When combined with other child health programmes, GMP services have been proven to positively impact child growth outcomes[2]. However, the health impact of GMP services is strongly dependent on factors such as programme coverage, the intensity of contact, health worker performance, and adequacy of resources[3].

Prevalence of malnutrition remains widespread in Bangladesh, with more than 20% of preschool aged children affected by stunting. In order to tackle the high burden of undernutrition, the Government of Bangladesh (GoB) has identified GMP as a priority activity in the National Nutrition Services' (NNS) Operational Plan (OP). The GMP programme is currently being implemented in all primary healthcare facilities of the government health system, including community clinics (CCs), with components including: (1) regular monitoring (at least every three months) of child growth through repeated measurements of weight, length, or mid-upper-arm-circumference; and (2) the provision of counseling for mothers / caregivers, micronutrient supplementation, community workers' home visits, and medical treatments or referrals of acutely ill children or children with faltering growth[4].

To strengthen the GoB's GMP programme implementation, an international Non-Governmental Organization (iNGO), World Vision Bangladesh (WVB), supported the GoB initiative by supplying additional health workers to assist in the implementation of GMP services in selected communities and CCs in 6 Upazilas of the Mymensingh division (*Mymensingh Sadar, Muktagacha, Fulbaria, Ishwarganj, Gauripur, and Trishal*). These health workers also provided community/home-based GMP services to children who failed to attend the CCs for regular check-ups/ measurements.

### **Purpose and Methodology**

Using both quantitative and qualitative methods, this research was conducted to assess the implementation of the GMP programme in both GoB and WVB-supported areas in the six upazilas of Mymensingh district - three Upazilas (*Mymensingh Sadar, Muktagacha, Fulbaria*) with WVB supported GMP services, and three (*Ishwarganj, Gauripur, and Trishal*) with regular GoB GMP programme implementation. The study also assessed the impact of COVID-19 related lockdowns on the implementation of GMP services in the study areas. We collected anthropometric, socioeconomic, nutrition-related, and other relevant data on 3038 children aged under two years- and-mother pairs, and followed them over 12 months. We observed GMP service delivery at the CCs and assessed the quality of GMP services at 3 points in time: an initial assessment from August to November 2019, a follow-up from January to March 2020, and a second assessment from September to December 2020. The quantitative data collection was complemented with 36 IDIs, 11 KIIs and 23 daylong indirect observations. Furthermore, we assessed the GMP implementation status during pre-COVID-19 (August 2019 to March 2020) and COVID-19 (September to December 2020) periods through interviews, checklist and observations.

## **Key Findings**

The overall findings of the study were as follows:

### ***GMP programme implementation in the GoB area***

In the GoB supported GMP areas, only 9% of children's weight was measured during the first assessment (which significantly deteriorated over time), and almost no child length measurement was taken or caregiver counseling provided throughout the study period. The majority of the mothers/caregivers never received GMP cards and as a result, their knowledge of child feeding and growth remained the same during the follow-up and second assessments. Caregivers were unaware of GMP service availability at CCs and its benefits, and as such, they did not bring their children for GMP services at CCs. Overall, the main barriers to the GMP programme implementation in the GoB areas included the absence of a national GMP guideline, the lack of GMP-specific training and capacity building of CHCPs, lack of resources, including unavailability of GMP card and necessary equipment for GM, the heavy workload and lack of support for CHCPs to conduct GMP, absence of a child tracking system for repeated GMP, lack of community-based GMP services, and lack of coordination between CC with local authorities.

### ***GMP programme implementation in the WVB area***

Despite the presence of WVB, GMP service delivery by CC staff did not improve in WVB areas over the study period. Furthermore, GMP service delivery in WVB areas was better prior to the pandemic compared to GoB areas. This was a result of WVB staff ensuring the availability of GMP services for healthy children at both CCs and at home, the use of a child tracking system that allowed for repeated measurements, GMP counseling tools developed by WVB and WVB ensuring the sufficient availability of GMP cards at CCs. Additionally, WVB staff provided GMP services on EPI days for better coverage; followed up with children who failed to attend CCs for GMP services and measured them at home and arranged courtyard sessions with mothers/caregivers for counseling. Nonetheless, WVB conducted GMP services without involving the CHCPs at CCs, and as such, the CHCPs lacked the capacity to provide GMP services independently. Finally, mothers/caregivers were knowledgeable on child feeding practices and nutritional status in the WVB areas. However, they were unaware of CC-based GMP services, as, before the pandemic they had relied on WVB staff for home-based GMP services.

### ***Impact of COVID-19 on GMP programme implementation***

GMP programme implementation was significantly affected by the COVID-19 pandemic in both GoB and WVB areas. CC staff continued GMP service delivery during COVID-19, but on a much-reduced scale. Supervision and reporting of GMP had also decreased, as managing the pandemic was prioritized over GMP service delivery. WVB stopped its GMP services as soon as the pandemic started, transferring all of its resources for COVID-19 management as per their donor's suggestion. Moreover, while GMP services were continued at CCs, caregivers who were reliant on WVB GMP services were unaware of the CC-based services. Hence, GMP service coverage and demand significantly diminished during the pandemic and expected results were not achieved.



## **Key Recommendations**

Based on the research findings, the study concludes with recommendations for future GMP programming:

- All partnership programmes that target delivering/strengthening essential or primary health care services should develop risk minimization and emergency response strategies in the planning phase and activate fast implementation of the strategy in case of an emergency.
- A national GMP guideline should be developed for uniform GMP service provision and quality assurance.
- Fixed dates for GMP service should be scheduled every week for better coverage by CCs.
- An adequately trained and additional skilled workforce is needed for GMP service provision, particularly for child length measurements.
- Adequate resource allocation which includes infrastructures, human resource, training, tools, etc is needed. In addition, creating an accountability mechanism and some incentive to CC staff from government would strengthen the GMP programme implementation.
- Building of community awareness is needed for GMP service demand generation in the community and better programme sustainability.
- Multi-sectoral collaboration and close engagement between government, NGO facilities, and local authorities are needed for successful and sustainable nationwide GMP programme implementation.

## 1. Background and rationale

Growth Monitoring and Promotion (GMP) is a preventative activity that uses the repeated measurement and interpretation of child growth to identify growth faltering and facilitates communication and interaction with caregivers to promote child growth [1]. This practice is recommended for children under 2 years of age. It includes conducting periodical/ monthly weight and length measurements of sick and healthy children, counseling caregivers on child care and feeding practices, and the treatment/referral of children with faltering growth. It is important to start recording child measurements at birth, and to input these measurements accurately on a growth chart, and interpret and explain the implications of the measurements to caregivers, for good caring practices. Ideally, health workers should provide information through counseling, facilitating communication, and interacting with mothers/caregivers based on the growth chart, aiming to generate adequate maternal and family-based action to promote child growth. GMP is an essential element of nutrition programmes, and when combined with other child health programmes, it can assist in the successful management of malnutrition in children. A programmatic review by Hossain et al., has identified GMP as one of the most successful programmes in stunting reduction[2], while research in several other countries like Ethiopia, Ghana, Nepal, Rwanda and Zambia have also shown success in the reduction of childhood malnutrition and growth faltering through the successful implementation of GMP services [3, 5-8]. The health impact of the GMP is dependent on programme coverage, the intensity of contact, health worker performance, and the adequacy of resources[3].

Bangladesh is committed to achieving the targets of the Sustainable Development Goals (SDGs) for nutrition. Nationally, between 1997 and 2022, the prevalence of childhood stunting and wasting has decreased significantly, from 60% to 24%, and from 21% to 11%, respectively[9] Despite this progress, 4 million children are still stunted in regional and socioeconomic pockets, creating a challenge to develop to their full physical and mental potential[4]. To tackle the high burden of undernutrition, the GoB has identified GMP as a priority activity in the National Nutrition Services (NNS) operational plan (OP). As such, GMP is being implemented in all primary healthcare facilities of the government health system, including community clinics (CCs).

A community clinic (CC) is a community-based healthcare facility of the GoB . It provides health, family planning, and nutrition services to 6,000 or more people in a community and is easily accessible (usually within a 30-minute walking distance). A community healthcare provider (CHCP) is the permanent service provider of a CC. While CHCPs usually do not provide community/home-based health and nutrition services, Health Assistants (HA) and Family Welfare Assistants (FWA) attend CCs on alternative days from their designated health and family planning facilities and provide community and home-based health services. In a CC-based GMP service, CHCPs are supposed to provide GMP services to every child under two years of age that attends the CCs, with the assistance of HA/FWAs. The GoB document review revealed that GMP is being implemented at the facility and community levels in the country. The child's well-being is assessed by weighing the child and plotting the weight against their age on a growth chart, which indicates standard growth patterns by age. All children aged 0-24 months living in the catchment area of a CC are weighed once every three months up to the age of 2 years. Counseling of mothers during GMP sessions is also focused on delivering messages regarding child care, child nutrition, etc. Children who have not attained the required weight for two successive months, have faltering growth, or have any illness are supposed to be referred to the physician [10][Currently, CCs supported by NGOs or other donor-funded programmes, including USAID, implement CC-based GMP

programme. GMP is also being implemented in the areas with no NGO or donor-supported activities (growth data are available through DHIS 2 online from all over Bangladesh). However, due to the enormous workload and a lack of proper training and resources, CHCPs struggle to provide GMP at CCs. Moreover, many children in the communities are deprived of GMP service opportunities as CHCPs also do not provide community/home-based GMP services. While CHCPs are responsible for providing GMP to all children aged under-2 who come to CCs, in most cases, caregivers bring their children to CCs only when they are sick, which leaves out many children from receiving GMP services. Moreover, as there are currently no tracking systems for children in the community, CHCPs are unable to track children for repeated measures.

World Vision of Bangladesh (WVB) supported the government's CC staff with an additional workforce in GMP service provision at CCs in selected Upazilas of Mymensingh district. Additionally, WVB staff provided home-based GMP services to those children who did not attend the CCs for GMP. WVB field workers, making home visits, were responsible for maintaining a register to track children for repeated GMP visits, which would support the CHCPs and strengthen the implementation of GoB's GMP programme - an approach that has been proven to be successful in other developing countries [3, 6-8]. However, the efficiency of WVB support in implementing GoB's GMP programme in Bangladesh has not been explored. During the study implementation period, the GoB declared a countrywide lockdown to curb the spread of COVID-19 infection. The impact of the COVID-19 lockdown on the implementation of the GMP programme in both the GoB and WVB-supported programme areas is yet to be understood. Therefore, this study aimed to assess the result of WVB's support in implementing the GMP programme in rural Bangladesh and the impact of the COVID-19 lockdown on the implementation of both the WVB-supported and non-supported GoB GMP programmes.

## **1.2 Study Objectives**

### **1.2.1 General Objective**

The general objective is to understand the role and result of WVB's support in implementing the GMP programme at CCs in rural Bangladesh.

### **1.2.2 Specific objectives**

- To assess the functionality of GoB's GMP programme implementation
- To assess the functionality of WVB-supported GMP programme implementation
- To understand the impact of the COVID-19 lockdown on GoB's GMP programme implementation
- To understand the impact of COVID-19 lockdown on WVB-supported GMP programme implementation
- Mothers/caregivers' knowledge, attitude, and practice (KAP) on GMP service
- Mothers/caregivers KAP on infant and young child feeding (IYCF) practice
- Policymakers KAP on GMP service delivery

## 2. Methods

### 2.1 Study Design, study site and timeline

This study followed a 2-arm, mixed-method descriptive design. The study was conducted in six sub-districts of Mymensingh districts at Mymensingh Division (Figure 1), which is one of the eight administrative divisions of Bangladesh. Mymensingh has an area of 10,485 square kilometers (4,048 sq mi) and a population of 11,370,000. The majority of the population are engaged in the agriculture sector (66%). Mymensingh has the highest wasting (13%) and second highest under-5 stunting prevalence in the country (28%) [9].

Mymensingh division was selected as the study site since WVB was already providing GMP services in certain sub-districts. We randomly selected three sub-districts (*Mymensingh Sadar, Muktagacha, and Fulbaria*) where WVB was implementing GMP services, and three neighboring sub-districts, *Ishwarganj, Gauripur, and Trishal*, where no organization other than GoB was providing GMP services. The neighboring sub-districts were chosen based on their proximity to the NGO area to minimize the geographic and socio-economic variation. To avoid spill-over effect of NGO programme on GoB-only GMP area, we kept a 2 km buffer zone between GoB and NGO programme areas.

We conducted the 1<sup>st</sup> assessment from August-November 2019, a follow-up from January 2020 to March 2020. On the end of the March 2020, the Government declared countrywide lockdown to curb the COVID-19 infection; Hence, we could not conduct the 2<sup>nd</sup> follow-up which was planned from May to July 2020. During the lockdown, WVB stopped GMP programme implementation and never started even after the GoB withdrew the lockdown on May 30, 2020. We monitored the COVID-19 situation on Mymensingh study sites from GoB's websites regularly and shared the updates weekly with RDM secretariat from March to December 2020. With consultation with the Donor USAID and RDM secretariat, we conducted 2<sup>nd</sup> assessment from September-December 2020.

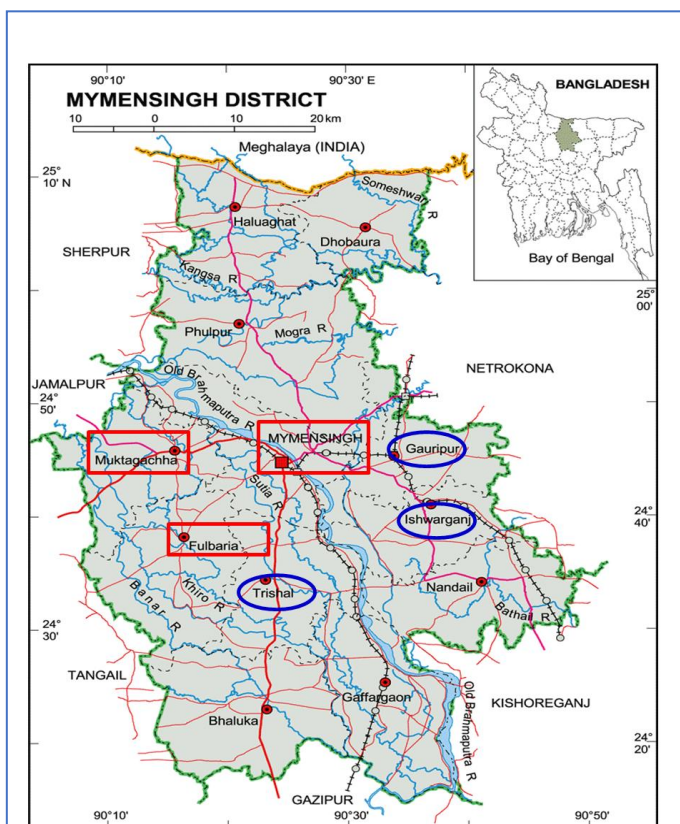


Figure 1. Map of the Mymensingh district with the WVB-supported area (red square) and GoB GMP service (blue circle) area

During the 1<sup>st</sup> assessment, we enrolled a cohort of 3,038 mother-child pairs (1,518 each from WVB and GoB area). We followed these 3,038 mother-children pair cohort throughout the study period as a close cohort manner, meaning we didn't replace the missing participants at any point of the data collection. During the follow-up, we interviewed 1469 mothers/caregivers from GoB area and 1486 mothers/caregivers from WVB area. On 2<sup>nd</sup> assessment, we interviewed 1395 from GoB area and 1428 from WVB area.

## **2.2 Components of GMP**

For this study, the components of GMP service which were evaluated include (1) regular monitoring (at least three-monthly) of child growth through repeated measurement of weight, length, or mid-upper-arm-circumference (MUAC); conversion of these measures to weight-for-age, length-for-age, weight-for-length; plotting these measures on a standard chart; combined with (2) counseling sessions for the mother/caregiver micronutrient supplementation; community workers home visits; and medical treatment or referral for acutely ill children or children with growth faltering[9].

## **2.3 GoB's GMP service area description**

Children in the GoB's GMP area only received the usual GMP services from CHCP at CCs. The CHCPs had no additional support from any other programme for GMP services. There were no community follow-ups or home visits from the CC staff. The GMP components are the same as described above [9].

## **2.4 WVB-supported service area description**

During the study period in Mymensingh, other than the GoB, only WVB provided GMP services. An additional workforce of trained local community health workers from the WVB-supported areas provided GMP services. The under-2 children in the WVB-supported areas received GMP services in CCs, usually provided by the CHCPs. In addition, the WVB staff conducted GMP at home for children who missed the CC-based GMP service. The support of WVBs to the CHCP at CCs and community/home-based GMP is expected to strengthen the implementation of GMP in the WVB-supported area.

## **2.5 Selection and Recruitment of study participants**

The icddr,b enrolled 3,038 mother-child pairs for the assessments, with informed written consent. Other than mother-infant pairs, CHCPs from the selected CCs participated in this study.

### **2.5.1 Eligibility Criteria of study participants for the assessment**

#### **Inclusion criteria**

- Children aged between 6–12 months at the time of enrollment.
- Free from known acute or chronic illness and/or a congenital anomaly or chromosomal abnormality assessed by trained field staff.
- Not severely stunted (LAZ below -3), wasted (weight-for-length Z-score, WLZ below -3), or underweight (weight-for-age Z-score, WAZ below -3).
- Not enrolled in nutrition WVB-supported areas or programmes at the time of enrollment

- Parents/legal guardians are willingly providing consent to participate in the study.
- Caregivers have no plans to move out of the catchment area in the six months following enrollment.

## 2.6 Data collection

We shared the first assessment results with the WVB programme managers and discussed the need for further capacity development of WVB staff for a successful GMP service delivery, especially for length measurement and counseling. Thus, we trained the WVB field staff on weight and length measurement of under-2 children and GM-specific counseling to caregivers in the first week of January 2020. We then conducted a follow-up assessment from the third week of January to March 2020 in the WVB-supported GMP service delivery area to understand the WVB staff capacity building and its effect on GMP service delivery. We collected information from the participants through two household assessments/assessments, between August-November 2019, and 12 months later, from September-December 2020. The assessment data consisted of household socio-demographic information, mother and child anthropometric measurements (length, weight, MUAC), information on infant and young child feeding (IYCF) practices and morbidity, and the quality of GMP implementation. During the assessments, we assessed the mother's/caregiver's knowledge, attitude, and practice (KAP) on IYCF, service providers' skills, and KAP on GMP. We conducted a follow-up after two months following the first assessment from January to March 2020.

Qualitative interviews were planned *a priori* to understand the following:

- (i) Knowledge, attitude, and practices of CC service providers required for the implementation of GMP services at CCs
- (ii) Caregiver's perception, knowledge, and experience of GMP services
- (iii) Experiences and recommendations of WVB and GoB GMP programme managers on operational challenges in implementing GMP service delivery
- (iv) The impact of COVID-19 lockdown and post-lockdown health service delivery restrictions on GMP service implementation: experiences from caregivers of children, CC staff, WVB programme managers, GoB policymakers
- (v) Views of concerned policy planners on GMP service implementation, with and without the WVB support.

## 2.7 Sample Size

### 2.7.1 Quantitative Assessment

We hypothesized that appropriate GMP would improve LAZ of under-2 children by 20% in NGO arm compared to the GoB-only GMP. We considered several assumptions for sample size calculations[11]: (i) mean LAZ of 6-12 months child age group in GoB arm would be -1.8; (ii) 1.3 SD; (iii) 80% power, 5% level of significance, and 0.02 intracluster correlation coefficient, and (iv) 15% dropouts (non-response, deaths, and loss-to-follow-up) from enrolment. Accounting for all these considerations, the sample size was 50 per cluster and 1510 per arm, and 3020 in total. We have employed 60 clusters design[12], meaning we needed 30 clusters (i.e. CCs and their catchment area) in each arm. Through mapping, listing and scoring of clusters, we selected 30 NGO CC area and 30 GoB CC area clusters. We enrolled a total of

3,038 mother-children pairs during the enrolment assessment. 1,510 children per arm; and 3,020 children in total in both arms.

### **2.7.2 Qualitative interviews**

We conducted interviews with purposively selected respondents: service providers of CC, Programme Managers of NNS, Line Director of NNS, WVB (WVB) manager, WVB GMP programme coordinator, and mothers/caregivers of under-2 children, using separate guidelines.

During the pre-COVID-19 and participant enrollment period, we conducted 16 in-depth interviews (IDIs) with CHCPs and 20 IDIs with mothers of enrolled children. Key informant interviews (KIIs) were conducted with 11 participants, which included the Line director and Deputy Programme Manager of National Nutrition Services (NNS); the Line director and Managing Director of community-based health care (CBHC); the programme coordinator, area programme manager, technical officer, two programme officers and two community promoters from WVB. In addition, daylong indirect observations were conducted at 23 CCs. During the second assessment period, as COVID-19 was still ongoing, we collected information on the impact of the COVID-19 lockdown and post-lockdown restrictions on GMP programme implementation. We conducted 15 IDI with CHCPs and 15 IDI with mothers of enrolled children. In addition, we also interviewed the Deputy Technical Programme Manager of WVB (WVB). The number of interviews was decided following an iterative process to achieve information saturation, i.e., we continued interviewing respondents until no new information emerged.

### **2.8 Quality control**

We ensured the quality of the assessment data through training and refresher training of field staff, and extensive monitoring and supervision of field activities. A monitoring and supervision team was formed comprising supervisors and the investigators. Team members made unscheduled field site visits to supervise the field activities. All questionnaires and data forms were reviewed for accuracy, consistency, and completeness immediately after data collection and before the respective assessment teams left the sites. The integrity of the database was maintained carefully. No participants' names or other personal information was entered into the database. Only the study ID numbers were recorded in the final database to keep privacy.

### **2.9 Data Analysis**

#### **2.9.1 Quantitative data analysis**

Descriptive statistics such as frequency and proportion for categorical variables, the mean and standard deviation for symmetric quantitative variables, and median and interquartile range (IQR) for asymmetric quantitative variables were used to summarize data. We used the *Chi-square* test to assess the bivariate relationship between outcomes and several types of indicators and study groups as exposures. A *t-test* or ANOVA was used to test the mean difference between the groups for quantitative variables. All these analyses were separately performed for different time points and relevant variables. The results were considered statistically significant at a  $p < 0.05$  level.

#### **2.9.2 Qualitative data analysis**

We followed thematic analysis for all the qualitative information. First, we interpreted the findings to develop a thematic description. Finally, the qualitative analysis included all thematic descriptions, analysis, and respondent quotations. Numbers of interviews were decided following an iterative process to achieve saturation of information i.e. we continued interviewing respondents until no new information emerged.

## **2.10 Ethical Assurance for the Protection of Human Rights**

The study received IRB approval from icddr,b. Written informed consent with full disclosure about the study was taken before all interviews. The privacy, anonymity, and confidentiality of data/information identifying the study participants were strictly maintained. None other than the study personnel had access to information on personal identification and other sensitive information. The study was prospectively registered in January 2019 at ClinicalTrials.gov (ID: NCT03824756).

## **2.11 Strengths and Limitations**

This study is the first-ever study in Bangladesh that reported the GMP implementation in rural areas with and without NGO support. It also identified the barriers and strengths of both GoB and WVB-assisted programmes. The findings of this study would help the programme and policymakers to take the necessary steps to improve GMP implementation in Bangladesh. Besides, including the assessment of the COVID-19 context in GMP programme implementation would further help the relevant stakeholders in decision-making during the pandemic for other health and nutrition-related programme implementation.

We had originally planned to compare the nutritional status of under-2 children residing in the GoB and WVB-supported GMP programme areas. However, we could not follow this plan as the WVB-supported GMP programme stopped and never re-started. Hence, we conducted a descriptive assessment of both GMP programme areas separately rather than comparing them. This separate analysis allowed us to understand better the underlying context and preparedness for GMP implementation in both areas. In addition, we took advantage of the COVID-19 period by continuing the study data collection during that period in order to understand the impact of COVID-19 on GMP implementation in both GoB and WVB areas. However, we could not initially follow the planned study path as the WVB programme was stopped during the COVID-19 lockdown and never re-started. We followed a closed cohort of mother-children pairs, meaning that children lost due to any reason were not replaced with new participants. This closed cohort follow-up helped us to understand the feasibility and adherence to the GMP programme by the participants within a community. In addition, this closed cohort of participants also allowed us to understand caregivers' perception, knowledge, and experience of GMP services delivery at WVB-supported and non-supported areas and their IYCF practices.



### 3. Results

This chapter describes the assessment of the GoB and WVB-assisted GMP programme across three time periods, wherein the quantitative findings are supplemented with qualitative findings. We discuss the study findings in three sections: the first section discusses the GMP activities' status in government areas, the second is about the GMP status in WVB-supported areas and the third discusses the impact of COVID-19 on GMP programme implementation in both GoB and WVB areas.

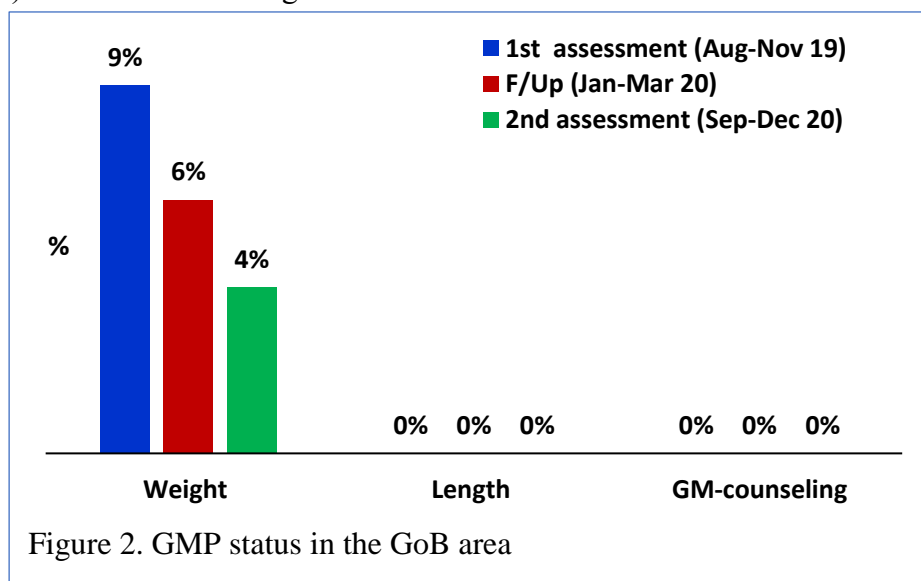
#### 3.1 Assessment of GMP programme implementation in government areas

In this section, we discuss the findings on the GMP programme's implementation status in government areas over the study period. This is based on the first assessment (August to November 2019), follow-up (January to March 2020), and second assessment (September to December 2020). In addition, this section describes the GMP programme's coverage, mothers'/caregivers' knowledge of, attitudes towards, and practices of GMP, community healthcare providers' (CHCP) knowledge of, attitudes towards, and practices of GMP activities at CCs, and infant and young child feeding practices in the government-supported GMP programme areas.

##### 3.1.1 Child weight and length measurement and growth monitoring-specific counseling status

In the areas supported by the GoB, the GMP services (weight measurement, length measurement, and counseling) were available only at CCs, with no changes over the duration of the programme period. There were no home-based or community-based GMP services. However, per the IPHN website, the GMP programme was implemented at CCs as well as at the community level[10]. At CCs, CHCPs prioritized sick children over apparently healthy children during the first assessment. At CCs, the CHCPs only measured child weight. Child length were never measured throughout the study period. However, child weight measurement significantly reduced at the second assessment compared to the first assessment in GoB's GMP area (09% vs. 04%;  $p < 0.001$ ). In the second assessment, children's weight was mostly measured at home by their parents/relatives, although the number is relatively low (45 children out of 1395). Few children's weight was measured at health facilities other than at the CCs. As shown in

Table 1, none of the mothers or caregivers received growth monitoring-specific counseling throughout the study period (Figure 2). Moreover, none of them knew their child's nutritional status during the assessments (Table 1).



### **3.1.2 Mothers/Caregivers' Knowledge, Perception, and Practice of GMP**

Although the GMP programme has been on-going for over 20 years, and services were available in most CCs and health facilities, less than 1% (02/1519) of the mothers/caregivers in the GoB-supported areas are aware of GMP activities or have seen (06/1519) GMP card during the first assessment. None of the caregivers received a GMP card during the first assessment. As shown in Table 2, we did not find any changes in mothers'/caregivers' knowledge during the study timeframe (Table 2). The predominant reason caregivers visited CCs with their child was when they fell ill and to obtain free medications. Additionally, caregivers did not perceive child weight and length measurement to be important and so did not visit CCs to measure their children, as shown in Table 1. Caregivers' lack of demand for GMP services was one of the major reasons for not measuring the child's weight and length at CCs (Table 1).

We conducted in-depth interviews (IDIs) with mothers/caregivers to understand the reason(s) for not going to CCs in spite of the services being available. Our IDIs with 5 of the 7 mothers revealed that no GoB worker visited their communities during the entire study period, and none informed them of the available services at the CCs:

*"They (CC staff) need to announce the service (GMP) before the programme so that we know about the service and take our child to the facilities."*

[IDI, Mother of 15-month-old child, GoB GMP area, November 2020]

### **3.1.3 Knowledge and practice of community health care provider (CHCP) on GMP service delivery**

#### **3.1.3a CHCPs knowledge of GMP and GMP service delivery**

We conducted IDIs and observations with the 7 CHCPs to assess their knowledge and practice on GMP service delivery at CCs in both the first and second assessment in the GoB area. Most CHCPs (4 out of 7 in the 1st and 5 out of 7 in the 2nd assessment) mentioned that GMP is a method of measuring the nutritional status of children by determining their length and weight. Most of them mentioned the term "GMP" but did not know the elaboration of GMP (5 out of 7). In most cases, by GMP, they meant "GMP card" (5 out of 7 on the 1st and 6 out of 7 on the 2nd assessment). Their knowledge during the 2nd assessment was consistent with the 1st assessment, and had not changed over the study period. The source of GMP knowledge was mainly from development partners like UNICEF and local NGOs like BRAC, ADRA, WVB, etc. None of the CHCPs received any GMP-specific training or guidelines for measuring the anthropometry of a child from the government. Therefore, they were unaware of detailed GMP components, and the frequency at which this service was to be provided to children, and of what ages (4 out of 7 CHCPs in the 1st and 5 out of 7 CHCPs in the second assessment).

The IDIs also revealed that CHCPs' knowledge of which child age groups to provide GMP services widely varies. For example, during the second assessment 6 out of 7 CHCPs mentioned that GMP services are for children between the ages of 2-5 years, 5 CHCPs mentioned children aged between 0 to 60 months, and the rest mentioned that GMP service is for children from 6 months up to 2 years old. In addition, the majority mentioned that weight measurements should be taken, and counseling should be provided, soon after birth (4 out of 7), and length/height should be measured after two years of age (5 out of 7). When asked the reasoning behind these different age groups for different GMP components, the CHCPs commonly mentioned a lack of human resources which is needed as a support during child

measurement, poor infrastructure which is a barrier for hanging or fixation of measurement scales and a lack of logistics supply.

*"Length measurement in children less than 2 years of age is difficult as there are limited ways of measuring child length by lying down. We have height stickers. Also, weight measurement in children under six months is difficult as these children cannot sit."*

[IDI, CHCP, GoB GMP area, November 2020]

During IDIs with CHCPs and CC observation, we found that only 2 CHCPs out of 7 measured child height. They mostly used height stickers for measuring child height-aged more than 1 year who could stand still. Our observation revealed that some of the CCs had length board (4 out of 7) but CHCPs did not use it. IDI revealed that, the CHCPs did not recognize the length boards and did not know its use as they did not receive training. Most of the cases they stored the length board in cupboards. Those who knew the purpose of length board (3 out of 7) did not use it due to lack of manpower to measure child length, as measuring a child length needs 3 persons (one holding the head, one holding the feet and rest to fix the child's body). In addition, the GoB's IPHN website mentioned regular weight measurements (every 2-3 months) and occasional length/height measurement and did not specify the frequency of length measurement under GMP. This lack of information might have created some confusion in length measurement among the CC staff. Few CHCPs (2 out of 7) also mentioned that since child length does not change frequently, so there is no need for regular and frequent measurement of child length.

There were various GMP measuring tools/instruments at CCs, including MUAC, digital weighing scale, Salter scale, length stickers, etc., but child length boards were scarce. We found only ten length boards in the 23 CCs observed during our first assessment. Key informants at the policy level stated:

*"We could not buy a scanner and length board as we have very little budget."*

[IDI respondent, GoB, December 2019].

All CHCPs mentioned that they counsel mothers about their child's health and nutritional status, including other necessary suggestions. For example, they counsel mothers to only breastfeed their child up to 6 months of age, and to give regular family food starting from 6 months of age, including fresh fruits, vegetables, eggs, etc. They also mentioned referring severely malnourished children to hospitals.

### 3.1.3b CHCPs practice on GMP and GMP service delivery

The CHCPs primarily measured child weight for children over one year of age. Most of the CHCPs (5 out of 7) did not know that length should be measured using a length board. Only 2 CHCPs measured child length for children over two years of age who could stand during the second assessment using height stickers. Most CHCPs (5 out of 7 in the 1st and 6 out of 7 in the 2nd assessment) prioritized sick children over apparently healthy children for GMP services at CCs, which resulted in fewer healthier GMP in CCs. The reasons they mentioned doing this were (i) caregiver's demands, (ii) workload on EPI day, (iii) online reporting on malnourished children only as the government online reporting system has option for malnourished children only, and (iv) repeated visits of sick children at CCs. A CHCP mentioned:

*"I do not measure length, weight, or MUAC of children who seem to be in good health; if I find any child looking pale, with sunken eyes, a vitamin deficiency, then I measure their MUAC or weight."* [IDI respondent, GoB, December 2019]

In the previous section (3.1.3a), during IDI all CHCPs mentioned that they counsel the caregivers. In practice, only 3 CHCPs (2 from the 1st and one from the second assessment) counseled mothers to feed their children as per the “Infant and Young Child Feeding (IYCF) guidelines” mentioned on the GMP card. CHCPs primarily counseled verbally due to time constraints, and only two mentioned that they counsel the caregivers by showing posters hung on the CC wall. They mainly counsel caregivers if the child seems too thin or sick or if the caregiver complains of insufficient appetite/growth.

During the first and second assessment, it was found that none of the 3,000 beneficiaries of the GoB area had received a GMP card. IDIs with the CHCPs revealed that there had been no GMP card distribution in the GoB area for two years, due to lack of supply from the GoB. Observations also revealed that CHCPs referred children to hospitals only when the child was severely ill. CHCPs could not identify severely malnourished children from others as they were short of GMP cards and training.

We observed that CHCPs maintain a register for child anthropometry record-keeping and upload the data on the GoB website daily. Respondents were asked how the length of a child was recorded in the register and uploaded on the GoB website, when every child was not being measured. Three CHCPs responded that the website only requires data on the number of malnourished children. Usually, no one checks and verifies how many children attend CCs every day and how many are measured amongst them. Indirect observation and IDIs revealed that sometimes they even copy the previous day's anthropometric records to fill the register and report on the website (9 out of 15 CHCPs). Since they have yet to receive any feedback from their supervisors on their daily reporting, this practice was considered legitimate.

### **3.1.4. Infant and young child feeding (IYCF) practices in the GoB area**

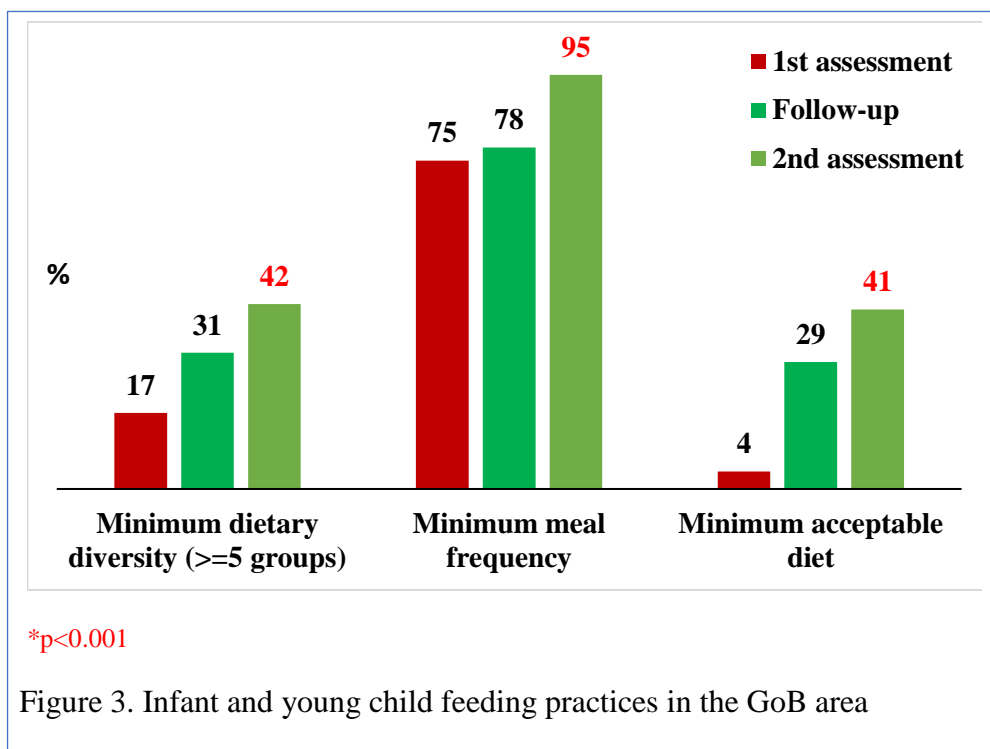
Appropriate infant and young child feeding (IYCF) practices according to the child's age are fundamental to improving nutritional status [10]. Therefore, a significant portion of GM counseling should be based on appropriate IYCF practices, which include early initiation of breastfeeding (within the first hour of life), exclusive breastfeeding in the first six months of life, continued breastfeeding for two years or more, and introduction of safe, appropriate, and adequate complementary foods at age six months. We collected information on IYCF practices to understand the effect of GM counseling in improving IYCF practices. This following section discusses the findings on IYCF practices in the GoB area.

#### **3.1.4a Breastfeeding status and Introduction of Complementary Foods**

Breastfeeding status was assessed for last-born children under the age of two, who are living with their mothers. At the first assessment, only 21% of children (n=272/1272) from the GoB GMP area were exclusively breastfed (Table 3), far below compared to the national level (65%). However, 97% of children from the GoB GMP area were breastfed during the last 24 hours of the interview. Over time, breastfeeding percentages were reduced as the child grew up and was introduced to regular family foods. The average duration of breastfeeding was 84 days in the GoB GMP area. During the first assessment, most of our study children were introduced to complementary feeding in both areas (99%; n = 1505/1519) (Table 3).

### 3.1.4b Minimum Dietary Diversity, Minimum Meal Frequency, and Minimum Acceptable Diet

Infants and young children should be fed a minimum acceptable diet to ensure proper growth and development. Without adequate diversity and meal frequency, infants and young children are vulnerable to undernutrition, especially stunting and micronutrient deficiencies, and increased morbidity and mortality [11]. All three parameters, minimum dietary diversity, minimum meal frequency, and minimum acceptable diet (combination of minimum dietary diversity and minimum meal frequency), significantly improved over time (Table 3, figure 3). Nonetheless, there was negligible GM-specific counseling. Our IDI with mothers/caregivers revealed that most learned child-feeding practices from their mothers/ mothers-in-law/ neighbors.



### **3.2 Assessment of GMP programme implementation in World Vision Bangladesh area programme**

In this section, we will discuss the findings on GMP implementation status in WVB-supported areas over the study period assessed during the first assessment (August to November 2019), follow-up (January to March 2020), and second assessment (September to December 2020). This section will explore the GMP coverage, knowledge, attitude, and practice of mothers/caregivers on GMP, as well as the knowledge, attitude, and practice of CHCPs at CCs on GMP, and IYCF practices in the government GMP area.

#### ***3.2.1 Child weight and length measurement and growth monitoring-specific counseling status***

The international WVB (World Vision Bangladesh) has been providing GMP services to children under two years old since 2018, in their service area, as part of their health and nutrition programme. Under this programme, WVB field staff were supposed to measure child weight monthly and length half-yearly and provide GM specific counseling to the caregivers of all children aged under-2 in the community.

Our first assessment revealed that less than a half of children's weights, and less than 2% of children's lengths were measured, and only 24% of caregivers received GM-specific counseling (Table 4). In this area, it was mostly WVB staff that measured the majority of children's weights (73%) and lengths. The CHCPs measured inly 10% of child weight in 1<sup>st</sup> assessment and 19% in 2<sup>nd</sup> assessment, length measurement remains 0% and <1% GM-specific counseling to caregivers. The overall performance of the CC staff in GMP service provision was unsatisfactory, with very low coverage. The WVB-supported programme was already being implemented in that community for more than a year, and as such, we expected good GMP service coverage in the WVB-supported area. However, the coverage of children's anthropometry measurement, especially length measurement and GM counseling to the children's caregivers, were very low. The WVB staff weight measurement was 73% in 1<sup>st</sup> assessment which reduced to 7% in 2<sup>nd</sup> assessment, length measurement reduced from 13% to 0% and GM-specific counseling was reduced from 24% to 0%.

As per WVB's GMP programme, they measured child weight every month, provide GMP card and counseling. WVB staff measured child length only once or twice a year. We noticed this during our 1<sup>st</sup> assessment and informed the WVB officials. Our KII revealed that WVB did not measure child length monthly as child length does not change frequently. We (icddr,b) informed WVB on the importance of regular length measurement as a part of GMP practice and requested WVB to measure child length every month. In addition, we (icddr,b) provided 1-day training to WVB staff on length measurement, plotting them on GMP length-for -age chart and counselling process for growth faltered child after the 1<sup>st</sup> assessment. After the training, WVB started length measurement.

Child weight measurement did not improve significantly from the first assessment to the follow-up period in the WVB-supported area (Table 4). However, length measurement and GM-specific counseling did improve significantly. In the WVB-supported area, WVB staff measured most of the children's weight (73.5%) and a few children's length (04/12, 13.3%), and it improved significantly after the training during the follow-up assessment period. However, there was a significant reduction in both weight (1<sup>st</sup> assessment to f/up: 10.3% to 3.5%) and length (26.7% to 0%) measurements by CC staff between the first assessment and the follow-up period. To understand the attitude and practice of CHCPs, we conducted IDIs

with CHCPs at CCs. Our IDIs revealed that CHCPs were reluctant to measure child length since the WVB staff would do that at home and in CCs.

Due to the surge of COVID-19, the government imposed a countrywide lockdown from March 26<sup>th</sup> to May 30<sup>th</sup> 2020. During the lockdown period, WVB stopped the GMP programme in their supported areas, which did not resume when the lockdown was withdrawn. Thus, the WVB staff neither measured children's length and weight nor provided GM-specific counseling to caregivers after March 2020 in the WVB-supported areas. As a result, the proportion of weight and length measurements and growth monitoring specific counseling were significantly lower at the second assessment, compared to the first assessment in the WVB-supported area (45% vs. 5%, 2% vs. 0.2%, 24% vs. 0.5% respectively;  $p < 0.001$ ). Child weight and length measurement services were available in CCs and other health facilities for a limited scale during the lockdown period. During the second assessment, a few children's weights were measured (68/1428, 4.8%), mostly by their mothers/caregivers/family members at home (40.2%), a few at CCs (23.5), and other health facilities (29.4%) in the absence of the WVB-support. The GMP services were available in most CCs and health facilities during and after the lockdown period, but the mothers/caregivers were unaware of the service. As a result, only a fourth of the mothers/caregivers could mention their child's nutritional status during the second assessment, which was the same as the first assessment (table 5, figure 4).

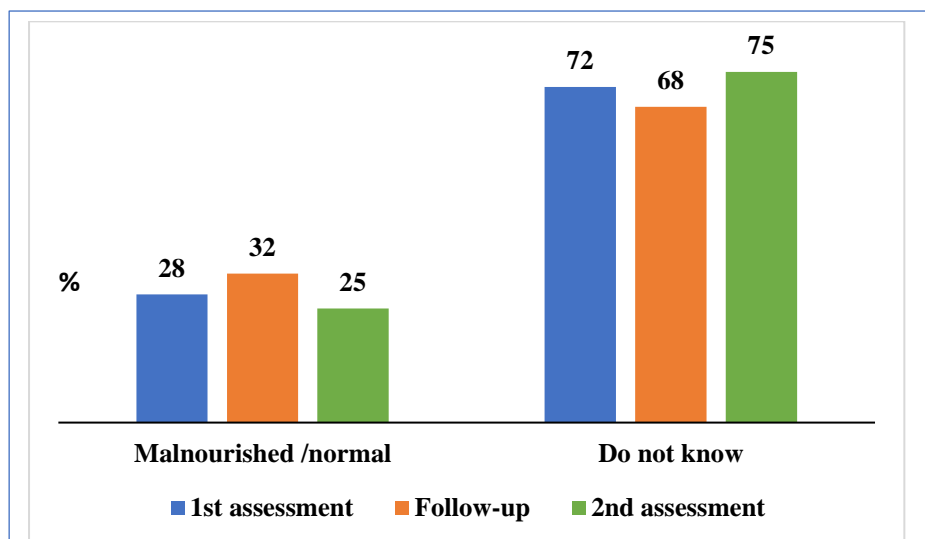


Figure 4. Caregivers interpretation of child nutritional status as per growth chart in WVB area

### 3.2.2 Mothers/Caregivers' Knowledge, perception, and practice of GMP

Although WVB had stopped the GMP programme for over five months, mother's/caregivers' GMP-related knowledge had increased significantly from the first assessment. More mothers/caregivers in the WVB-supported area had heard about GMP services during the second assessment compared to the first (14.6 % vs. 4.3%) (Table 5, figure 5). The coverage of GMP card distribution increased between the first and the second assessment periods in the WVB-supported area ( $p < 0.001$ ). Significantly more mothers/caregivers were able to mention the purpose of the GMP card during the second assessment (49% vs. 64%;  $p < 0.001$ ) compared to the first, and a higher number of mothers/caregivers knew the purpose of the growth chart on the GMP card in the second assessment (16.8% in the first assessment vs. 21.3% in the second,  $p < 0.01$ ) (figure 5). Our IDI with mothers revealed that, most of the mothers (6 out of 7), however, were unaware of their children's age-appropriate length and weight. Most of them assessed their children's health and nutritional status with their naked eye (5 out of 7), comparing their child's health with those of other children of the same age in the community. Some mothers also assessed their child's health based on their appetite and feeding patterns. If the child did not finish their meal or had a poor appetite, mothers would assume that the child is not healthy. This finding is consistent with the findings from GoB area mothers/caregivers (section 3.1.2).

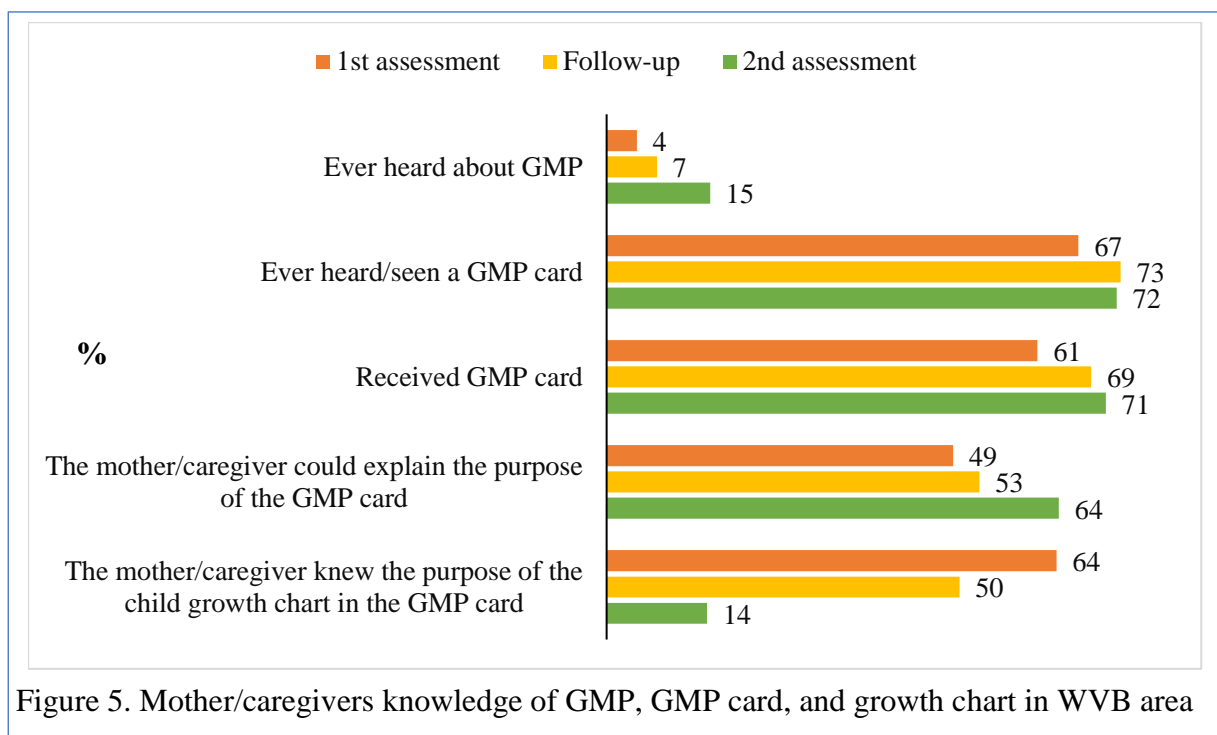


Figure 5. Mother/caregivers knowledge of GMP, GMP card, and growth chart in WVB area

To understand the reason behind this type of attitude or knowledge, we conducted IDIs with mothers/caregivers. Our IDIs with mothers revealed that the majority of mothers/caregivers did not receive a complete package of GMP services. By full-service package, we meant taking monthly measurements of the child's length and weight, recording them on the GMP cards, informing the mothers/caregivers about the child's nutritional status, counseling them on IYCF and how to maintain/improve the child's nutritional status. In addition, mothers/caregivers in the WVB area primarily relied on WVB staff for home-based GMP service delivery. Therefore, they were unaware of GMP services at CCs (3 out of 4 mothers). Also, there was a lack of



service demand as people did not see the immediate benefit of GMP services. For example, a mother of a 19-month aged child mentioned:

*“.....rural people want instant benefit, for example- they will go for vaccinations, as they know it cures disease. But people do not give importance to measuring (child) length and weight, as it has no instant benefit.”*

[IDI, mother of 8 months old child, WVB GMP area, November 2019]

In addition, community people prefer cash/monetary benefits from a programme rather than the free GMP services. As GMP is not providing any cash or benefits for taking the service, mothers/caregivers are not interested in measuring their child's length and weight and taking the child to CCs for GMP services.

### ***3.2.3 Knowledge and practice of community health care provider (CHCP) on GMP service delivery***

We conducted IDI and indirect observations at CCs to understand the knowledge and practice of CHCPs from the WVB-supported areas during the 1st and 2nd assessments. CHCPs had some ideas and knowledge on conducting GMP. They received training from WVB staff and were provided with GMP cards and counseling materials (flipcharts, banners, etc.) prepared by WVB. Most of them had a basic understanding of GMP, but they did not know all the components of the GMP in detail and how frequently this service will be provided to children and of what ages (8 out of 15 CHCPs). However, most CHCPs (11 out of 15 CHCPs) knew that GMP is an activity for assessing the nutritional status of children by determining length and weight. This knowledge is consistent with the 1st assessment assessment and did not change over the study period. Five CHCPs described GMP by mentioning different components of GMP service and could explain the different colors in growth charts (weight and length chart) by the severity of malnutrition. They had mentioned that the changes in a child's length and weight are related to their age; this response was somewhat of an improvement from the enrolment results (at enrolment, only 2 out of 16 CHCPs mentioned this).

*“There are some stages for weight measurement. If the child's weight is low according to age and positioned into the red mark, that means he is severely malnourished; when the marks are placed into the yellow mark, it indicates that the child is moderately malnourished. If it is placed in the green, it means that the child is all right.”*

[IDI, CHCP, WVB GMP area, November 2019]

Like the GoB area (section 3.1.3a), most CHCPs (7 out of 8 from the WVB-supported area) prioritized sick children over healthy children for GMP service at CCs. The reasons for the preference were also similar to the GoB area (section 3.1.3a). Knowledge on measuring child weight, length, and counseling varied among CHCPs. This variance was related to CHCP's education level, training, and work experience. Like GoB-area CHCPs, WVB-area CHCPs mentioned different age group preferences for weight and length measurement and with different apparatus. However, most of the CHCPs faced difficulties in measuring the length of young children less than six months of age.

*“Length measurement in children less than six months is difficult because the child needs to lie down next on the length scale, and the mother is often confused about holding the child on the*

*scale and controlling the child's movement. Besides, I need help with length measurement. So, I don't measure the length of children younger than six months of age."*

[IDI, CHCP, WVB GMP area, October 2019]

All CHCPs from the WVB-supported and GoB GMP areas mentioned that they did not hear or receive any specific guidelines for GMP from the GoB throughout the study period. Most CHCPs from the WVB-supported and GoB GMP areas mentioned that they were not confident conducting GMP alone.

Most CHCPs mentioned that they counsel mothers on their child's health and nutritional status, including other necessary suggestions. For example, in the WVB area, more CHCPs (4 from WVB-supported areas and two from the GoB GMP area) counseled mothers on feeding their children as per the "Infant and Young Child Feeding (IYCF) guidelines" mentioned on the GMP cards. WVB area CHCPs also mentioned counseling caregivers by showing them flipcharts and GMP cards.

WVB staff were supposed to support CHCPs with GMP services at CCs in the WVB-supported area. Our KIIs revealed that the WVB staff independently conducted GMP services at the CC and HH level; they seldom involved CHCPs in conducting GMP. So, WVB-supported area CHCPs did not develop the capacity to conduct GMP services alone and with confidence. The skills, expertise, and practice of GMP services among the WVB-supported area CHCPs over the study period differed slightly. The GMP reporting practice for the Government website was similar for both the WVB area CHCPs and GOB area CHCPs (section 3.1.3b). Similar discrepancies between GMP service delivery and website coverage reporting data were found in both areas.

### **3.2.4 Knowledge and practice of community promoter (CP) on GMP service delivery**

#### **3.2.4a Education level and work experience**

An effective GMP service delivery depends on the knowledge and practices of the service providers. The success of a CP of WVB in conducting GMP services is dependent on how well they use their knowledge and expertise to deliver GMP services to the beneficiaries. To understand the CP's knowledge and practice, we observed the CP's work and conducted IDIs with her. Education and working experience were essential to CP's GMP service delivery skills. We noticed that CPs with a minimum schooling till grade 10, and five years of work experience were successful in motivating caregivers to willingly attend CCs for GMP services. They were able to make the caregiver understand the importance of GMP services and also increase their awareness of their child's health.

On the contrary, CPs with lower educational qualifications were unable to write numbers correctly on the register after measuring the child's weight during the GMP session. The health condition of the CPs also influenced their GMP service delivery. We noticed that CPs with any illness(es) were unable to concentrate on their work and needed additional support to complete their assigned daily tasks. During indirect CC observation, we noticed that a child who had come to the CC for GMP services had to return without receiving the services as the CP was unable to take the child's measurements because of her illness.

#### **3.2.4b Community promoters service workload and Accuracy in GMP service delivery**

Our IDIs with CPs, and observations, revealed that the CPs were assigned many duties, including screening pregnant mothers and under-5 children in the community, delivering ANC services, delivering Positive-Deviance/Hearth services to moderately and severely malnourished children (another WVB programme), etc., apart from GMP service provision. They did not receive any clear guidelines from their supervisors on multitasking or prioritizing, and as a result, their service provision for GMP was being heavily compromised. For example, although GMP service is one of their priority tasks, we found that 3 out of 5 CPs were assisting with vaccinations during EPI sessions rather than GMP service provision. A caregiver of a young child stated during the first assessment:

*"She (CP) mainly came to inform (us) about the EPI vaccination day, which is why she might have forgotten to tell us about (child) weight measurement. I did not go to measure my child's weight after her third vaccine. Her next vaccination is due after ten months."*

[IDI, Mother of 7-month-old child, WVB GMP area, October 2019]

We observed that the CPs measure the weight of under-2 children with their mothers. First, they measure the mother's weight with the child in her arm, and then they measure the mother's weight alone. After that, they deduct the mother's weight from the combined mother-child weight to get the child's weight. During this procedure, mothers need to stand still on the weighing machine and look forward and not move. We observed that many mothers did not stand straight on the weighing machine, and they frequently looked downwards at the machine display to see their weight. However, CPs did not notice that and recorded the incorrect weight on their registers. During the IDI sessions with mothers, we found three children enrolled under WVB's GMP programme and GoB's "JAWTNO" project. We also identified that CPs did not measure the child's weight regularly every month (5 out of 16 children were measured regularly), mothers IDI). For example, a mother of an 11-month-old child shared that a CP measured her child's weight only twice in the last ten months, but the GMP card revealed that the child's weight was measured every month for the last ten months. According to the GMP card, the child had appropriate monthly weight gain for their age. However, we found that the child was moderately malnourished during our assessment measurement. Upon further questioning, the mother revealed that the CP took the GMP card from the mother monthly, marking points on the child's weight chart in the GMP card on her own without measuring the child.

### ***3.2.5. Infant and young child feeding (IYCF) practices in the WVB area***

#### **3.1.4a Breastfeeding status and Introduction of Complementary Foods**

During the first assessment, only 14% of children from the WVB-supported area were exclusively breastfed (Table 6), much lower than the national level (65%), and 97% of children were breastfed during the last 24 hours of the interview, which reduced over time as the child grew older and was introduced to regular food. The median duration of breastfeeding was lower in WVB areas than in GoB areas (67 days in the WVB-supported area compared to 84 days in the GoB GMP area). During the first assessment, 98% of study children were already introduced to complementary feeding (Table 6).

#### **3.1.4b Minimum Dietary Diversity, Minimum Meal Frequency, and Minimum Acceptable Diet**

All three IYCF indicators significantly improved with time since the first assessment in WVB areas (Table 6). The minimum dietary diversity (taking more than or equal to 5 out of 8 food

groups) and minimum acceptable diet doubled since the first assessment (24% vs. 48%,  $p < 0.001$  and 23% vs. 49%,  $p < 0.001$ , respectively). Despite the successive increase of MDD and MAD, with age, more than half of the children in the WVB area lacked a minimum acceptable diet. Without adequate dietary diversity and meal frequency, infants and young children are vulnerable to undernutrition, especially stunting and micronutrient deficiencies, and increased morbidity and mortality [11].

### **3.3 COVID-19 Pandemic's effect on overall health services access and GMP service delivery**

At the end of March 2020, the COVID-19 pandemic hit Bangladesh, and the GoB imposed a countrywide lockdown till May 31st, 2020. During this lockdown period, most health service delivery was limited to curb the spread of the infection, including GMP at CCs. This section focuses on the COVID-19 pandemic's effect on GMP programme implementation at both GoB and WVB areas. We attempted to assess the pandemic's impact on GMP service delivery by comparing pre-COVID-19 period (August 2019 to March 2020) data with COVID-19-19 pandemic period data (April to December 2020). The section is again sub-divided into two sub-sections: COVID-19's impact on GMP service delivery at CCs by CHCPs and WVB GMP programme service delivery.

#### **3.3.1 GMP service delivery at CCs by CHCPs in the GoB area**

We tried to understand the effect of the COVID-19 pandemic on the activities of CHCPs on GMP service delivery, especially on measuring a child's length, weight, and GM-counseling to the mothers on IYCF practices and child's nutritional status. Our assessment findings revealed that the CHCPs did not measure child length or provide GM counseling to the caregivers in the GoB area during the COVID-19 period (Table 7). In addition, weight measurement was also significantly reduced in the COVID-19 period compared to the pre-COVID-19 period (8% vs. 4%,  $p < 0.001$ ). During pre-COVID-19, child weight was measured primarily in homes by their caregivers/relatives, followed by CCs, courtyard meetings, and other health facilities. This scenario did not change over time. However, measurement at home and CCs slightly increased during the COVID-19 period. Our IDIs with CHCPs revealed that 5 out of 7 CHCPs stopped measuring length and MUAC and mostly provided counseling to caregivers and measured the weight of a sick child.

#### **3.3.2 GMP service delivery at CCs by CHCPs in the WVB area**

In this section, we would highlight the effect of the COVID-19 pandemic on the activities of CHCPs in the WVB area. CC observation and IDIs with CHCPs revealed that CHCPs from WVB-supported areas discontinued measuring child length and MUAC (as it needs closer contact with the child) to avoid infection/re-infection (3 out of 8 WVB-supported areas CHCPs):

*"When the COVID19 pandemic started, we stopped measuring weight because we do not want to spread the virus among pregnant mothers and children."*

[IDI, CHCP, WVB GMP area, November 2020]

During IDIs, 6 out of 8 WVB-supported area CHCPs mentioned that they needed to develop their confidence for providing GMP services on their own - they wanted guidance from WVB staff for GMP services, especially for height measurement. As such, most of the CHCPs from

the WVB-supported area stopped height/length measurements at CCs during the pandemic period. In addition, three CHCPs from WVB-supported areas mentioned that WVB never involved them in weight and length/height measurements. Hence, they did not know how to measure a child's height/length and weight at CCs. As a result, child weight measurement significantly reduced in the COVID-19 period compared to the pre-COVID-19 period (7.9% vs. 4%,  $p < 0.05$ ).

Before the pandemic, WVB staff organized the GMP sessions during the EPI day for maximum coverage. The EPI sessions were continued even during the lockdown period, but the GMP sessions were stopped in most CCs. Therefore, most mothers/caregivers were aware of the EPI sessions during the pandemic but unaware of the GMP service at CCs. In addition, those CHCPs who continued to provide GMP services during the lockdown and post-lockdown period provided GMP in a limited manner (only measuring child weight), mainly prioritizing sick children. During IDIs, the CHCPs mentioned child weight measurement by following COVID-19 safety measures which include: (i) maintaining social distancing (8 out of 15 CHCPs), (ii) wearing a mask (3 out of 15 CHCPs) and (iii) gloves (2 out of 15 CHCPs).

Although WVB stopped GMP implementation in the WVB-supported area, our KII with WVB programme area programme manager revealed that they provided masks and gloves to CC staff for their COVID-19 prevention project. However, only a few (3 out of 7 CCs) GoB GMP area CC staff received masks and gloves as per COVID-19 biosafety measures from the government. As a result, 63% (5 out of 8) of the WVB-supported area CHCPs followed at least 1 COVID-19 safety measure, compared to only 43% CHCPs from the GoB GMP area (3 out of 7 CHCPs) while providing services from CC during the pandemic period. The CHCPs maintained social distance by limiting the entry of patients inside the CCs. They placed a table near the exit door of CC and provided services from there. Since it is difficult for CHCPs to provide GMP while maintaining social distance, they stopped GMP services. We found only one exception: a CHCP provided GMP services to under-five children during the pandemic while maintaining proper COVID-19 safety precautions.

### ***3.3.3 The WVB-supported GMP services***

We communicated with the division manager of WVB over the phone during the lockdown period to get an update on programme activities and any programme adaptation/modification plans during the pandemic. The manager informed us that they had stopped measuring child anthropometry, including all other community-based nutrition services, as soon as the lockdown started. WVB also withdrew many field staff providing GMP services at the community level. Only selected field staff provided COVID-19 safety services (but not GMP) during the lockdown period. Hence, GMP service delivery significantly deteriorated in WVB-supported areas (Table 7). The manager also informed us that WVB might resume work after the lockdown. The GoB lifted the lockdown on May 31<sup>st</sup>, 2020, and resumed all of its regular activities, however, the WVB GMP programme never resumed after the lockdown. The Programme Manager of WVB stated that they had transferred all of their GMP programme staff and budget to the COVID-19 emergency response programme, and hence, WVB would only focus on pandemic-related services, such as creating safety awareness for people and providing safety materials (masks and gloves) to service providers till the pandemic was over. However, they did not inform CC staff or the NNS about their programme discontinuation decision. Since the CC staff relied on WVB staff for both sick and healthy child GMP services, they did not measure healthy children and only prioritized sick children for GMP services in the absence of WVB support. In addition, community members and caregivers were also

unaware of the WVB programme's discontinuation decision, and they waited for WVB's home-based GMP services instead of going to CCs for the service. Most of these community members who relied on WVB's GMP support were also unaware of CC-based GMP service both before and during the pandemic.

The WVB Programme Manager informed us that WVB is less interested in measuring child length monthly, as the changes in length could only be noticed after a specific time and is a labor-intensive task. In addition, their field-level workers needed to be more skilled to precisely measure length every month. Therefore, in the absence of WVB staff, most GMP services were delivered by private health facility staff, CHCPs, or other WVB or NGOs in the WVB-supported area (Table 7).

### ***3.3.4 Mothers/Caregivers' Experience and Opinion on GMP service delivery during the pandemic***

IDIIs with caregivers revealed that no GoB or NGO worker visited their communities during the lockdown. Hence, 6 out of 8 WVB area mothers needed help remembering the information they had received from WVB before the lockdown during the second assessment. When asked about their opinion on GMP service delivery, they showed appreciation for the GMP service from WVB, which they had received before the pandemic, as it had helped them understand their child's health status. They also emphasized the importance of counseling since it had helped them to feed their children and improve their nutritional status. One mother during an IDI mentioned:

*"If this programme continues, it will be good. We will learn more from them (WVB staff) about how to care for children, and which food will help increase length and diminish weakness."*

[IDI, Mother, WVB GMP area, December 2020]

Despite the availability of GMP services at CCs during the pandemic, mothers/ caregivers from both the GoB and WVB were unaware of it. There were no community awareness generation activities from the government for GMP services. A mother from the GoB area mentioned:

*"They (CC staff) need to announce the (GMP) services before the programme so that we know about the service and can take our children to the facilities."*

[IDI, Mother, GoB GMP area, November 2020]

### ***3.3.5 Infant and young child feeding (IYCF) practices***

In the pre-pandemic period, most children in the study areas were between 6-15 months and thus received breastfeeding and complementary feeding. The percentage of exclusive breastfeeding was low, only 21% in the GoB area and 14% in the WVB area. However, during the pandemic period, most of these children were older, and none of them were exclusively being breastfed - all of them were eating the same food as their family members in both areas. Thus, breastfeeding prevalence significantly reduced from pre-COVID-19 to COVID-19 period (97% vs. 86%,  $p < 0.001$ ). In addition, the minimum acceptable diet, minimum meal frequency, and minimum dietary diversity significantly increased from the pre-COVID-19 to COVID-19 period as the child grew up (Table 8). Our IDIs with caregivers revealed that none of them received IYCF-specific counseling from any provider during the pandemic in both GoB and WVB areas. Nonetheless, caregivers had learned about child-feeding mostly from

their relatives/ family members or the media (television, radio, etc.), and few from their previous experiences.

## 4. Discussion

In this study, we assessed the situation of GMP implementation in CCs and its service coverage areas in few selected Upazilas of Mymensingh district. This is the only study ever conducted in Bangladesh which assessed GMP implementation in CCs with and without WVB-support. In addition, we assessed the impact of COVID-19 on GMP programme implementation in both the GoB and WVB-supported areas. The GMP programme in Bangladesh has been ongoing for more than 20 years. That said, the GMP service delivery and coverage by CCs still needs to be improved in both WVB-supported and non-supported areas.

In the GoB-supported GMP areas, only 9% of children's weight was measured during the first assessment (which significantly deteriorated over time), and almost no child length measurement was taken or caregiver counseling provided throughout the study period. The majority of the mothers/caregivers never received GMP cards and as a result, their knowledge of child feeding and growth remained the same during the follow-up and second assessments. Caregivers were unaware of GMP service availability at CCs and its benefits, so they did not bring their children for GMP services at CCs. This study identified significant barriers to GMP programme implementation in Bangladesh in both GoB and WVB programme areas. Similar factors have also been reported by other Asian and African studies [4, 6, 12-15]. Significant barriers to implementing GMP in CCs of GoB areas include the absence of a national GMP guideline, lack of GMP-specific training and capacity building of CHCPs, lack of resources including GMP card availability and necessary equipment for GM, workload, lack of support for CHCPs to conduct GMP, absence of a child tracking system for repeated GMP, lack of community-based GMP service, lack of coordination between CCs with local authorities and lack of monitoring and supervision of CC staff. Moreover, there is still limited knowledge and awareness of the concept of GMP services for healthy children among CC staff and caregivers of children in the GoB area. As a result, there was no well-child GMP in the GoB area. Mothers/ caregivers were not aware of GMP service availability at CCs or the benefits of GMP throughout the study period due to lack of community-based promotion for GMP service. Caregiver/ community demand for GMP services was also limited as the community people were unaware of the importance of taking regular GMP service and they did not know where GMP services were available. This situation deteriorated further during the COVID-19 period. The CC staff continued the GMP service during COVID-19 but on a minimal scale. The supervision and reporting of GMP also weakened during the COVID-19 pandemic period due to prioritizing the pandemic over GMP service delivery.

The situation of GMP service delivery by CC staff at the WVB area was similar to the GoB area mentioned above. However, due to the presence of WVB in that area, the GMP service delivery was better before the pandemic than in the GoB area. Major facilitators were the presence of well-child GMP service at both CCs and home by WVB staff, the presence of a child tracking system that allowed repeated measurements and that WVB developed and provided GMP counseling tools and ensured supply of GMP cards to CCs. Similarly, WVB staff conducted GMP in EPI days for better coverage, children who failed to attend CCs for GMP were measured at home and WVB arranged courtyard sessions with mothers/caregivers for counseling. Nonetheless, WVB conducted GMP without involving CHCPs at CCs, and as such, the CHCPs lacked the capacity to provide GMP services independently. The mothers/caregivers were mainly aware of child feeding practices and nutritional status in the WVB area. However, they were unaware of CC-based GMP service availability, since WVB staff visited their homes for GMP before the pandemic.



The COVID-19 pandemic badly hit the WVB GMP programme implementation, as the WVB stopped its GMP services as soon as the pandemic started, directing all of its resources towards management of COVID-19 as per their donor's suggestion. As a result, the GMP programme in the WVB area was not strengthened. Without WVB, the CC staff continued GMP services at CCs. However, caregivers were unaware of the CC-based GMP service, as they relied on WVB for home-based GMP service and were not aware that WVB's programme had stopped because of the pandemic. Hence, GMP service coverage and demand became very low during the pandemic. The WVB-supported GMP programme stopped implementation due to a lack of risk minimization and emergency response strategies towards the COVID-19 crisis. In addition, their lack of engagement with the CC staff hindered the GMP programme strengthening and service delivery during the pandemic. Moreover, home-based GMP service delivery increased the coverage but needed to generate community/caregiver awareness and demand for GMP. As a result, the WVB programme could not achieve its expected results. Based on the results of this study few recommendations are made for GMP programme implementors and policy makers for further strengthen this nationwide long-implemented programme:

- health systems' resilience should be increased and that partnership programmes should be involved with the strengthening/ help existing systems to become more resilient to cope emergencies and shocks like COVID-19. In addition, the GMP programme needs to be continuously monitored to identify and adopt necessary changes needed to be made during emergencies and shocks.
- multi-sectoral collaboration and close engagement between government, NGO facilities, and local authorities are needed for successful and sustainable nationwide GMP programme implementation.
- a national GMP guideline should be developed and shared among the health service providers for uniform GMP service provision and quality assurance.
- fixed dates for GMP service should be scheduled every week for better coverage by CCs.
- building of community awareness is needed for GMP service demand generation in the community and better programme sustainability
- an adequately trained and additional skilled workforce is needed for GMP service provision, particularly for child length measurements. In this situation, multipurpose health volunteers could be engaged for length measurements at CCs and community based GMP awareness/promotion to raise the awareness and demand for GMP in communities.
- adequate resource allocation which includes infrastructures, human resource, training, tools, etc is needed. In addition, creating an accountability mechanism and some incentive to CC staff from government would strengthen the GMP programme implementation.

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## Annexure

**Table 1. GMP service coverage in the GoB area**

Indicators, n (%)	1 <sup>st</sup> assessment (n=1519)	Follow-up (n=1469)	2 <sup>nd</sup> assessment (n=1395)	p-value
<b>Child weight measured</b>	138 (9.08)	94 (6.4)	59 (4.23)	<0.001** *
<b>The person who measured the child's weight (multiple responses)</b>				
Family members/friends/relatives	43 (31.2)	35 (37.23)	32 (54.24)	0.007**
Community clinic staff	5 (3.62)	10 (10.64)	6 (10.17)	0.071
World Vision staff	0 (0)	1 (1.06)	0 (0)	-
Others (hospital/clinic/drug store/other NGO or programme staff)	90 (65.22)	48 (51.06)	21 (35.59)	<0.001** *
<b>The place where the child's weight was measured (multiple responses)</b>				
At home	47 (34.06)	37 (39.36)	29 (49.15)	0.108
Community Clinic	9 (6.52)	9 (9.57)	5 (8.47)	0.657
Other health facilities	75 (53.62)	43 (45.74)	22 (37.29)	0.110
Other places (EPI center, drug store, etc.)	13 (9.42)	8 (8.51)	4 (6.78)	0.853
<b>Reason for not measuring child's weight (multiple responses)</b>				
Unaware of the service at CC	649 (53.73)	749 (55.9)	609 (46.6)	<0.001** *
Child measurement is unnecessary	420 (34.77)	430 (32.09)	725 (55.47)	<0.001** *
<b>Child length measured</b>	0 (0)	0 (0)	0 (0)	-
<b>The person who measured the child's length (multiple responses)</b>				
Family members/friends/relatives	0 (0)	0 (0)	0 (0)	-
Community clinic staff	0 (0)	0 (0)	0 (0)	-
World Vision staff	0 (0)	0 (0)	0 (0)	-
<b>Places where the child's length was measured (multiple responses)</b>				
At home	0 (0)	0 (0)	0 (0)	-
Community clinic	0 (0)	0 (0)	0 (0)	-
Other health facilities	0 (0)	0 (0)	0 (0)	-
<b>Caregivers reason for not measuring the child's length (multiple responses)</b>				
Unaware of the service at CC	882 (58.41)	892 (61.1)	738 (53.06)	<0.001** *
Child measurement is unnecessary	525 (34.77)	473 (32.4)	698 (50.18)	<0.001** *
<b>GM-specific counseling provided</b>	0 (0)	1 (0.07)	0 (0)	-

\*p<0.05, \*\*p<0.01, p<0.001

**Table 2. Mothers/caregivers' knowledge attitude and practice on GMP programme in the GoB area**

Indicators, n (%)	1 <sup>st</sup> assessment (n=1519)	Follow-up (n=1469)	2 <sup>nd</sup> assessment (n=1395)	p-value
<b>Mother/caregivers knowledge of GMP</b>				
Ever heard about GMP	2 (0.13)	2 (0.14)	0 (0)	-
Ever heard/seen a GMP card	6 (0.4)	4 (0.27)	1 (0.07)	0.215
Received GMP card	-	-	-	-
<b>Knowledge of GMP card and growth chart</b>				
The mother/caregiver could explain the purpose of the GMP card.	-	-	-	-
The mother/caregiver knew the purpose of the child growth chart in the GMP card	253 (16.66)	105 (7.15)	71 (5.09)	<0.001** *
<b>The mother/caregiver mentioned the child's nutritional status as per the growth chart</b>				
Malnourished	-	-	-	-
Normal	-	-	-	-
Do not know	1518 (99.93)	1468 (99.93)	1394 (99.93)	0.99
<b>Mothers/caregivers knew how to take care of their child as per the nutritional status (from growth chart interpretation)</b>	-	-	-	-

\*p<0.05, \*\*p<0.01, p<0.001

**Table 3. Infant and young child feeding practices in the GoB area**

<b>Infant and young child feeding (IYCF) practice indicators, (%)</b>	<b>1<sup>st</sup> assessment (n=1519)</b>	<b>Follow-up (n=1469)</b>	<b>2<sup>nd</sup> assessment (n=1395)</b>	<b>p-value</b>
<i>Breastfeeding and complementary feeding status</i>				
Exclusive breastfeeding, %	272 (21.4)	-	-	-
Breastfeeding (BF) in the last 24 hours, n (%)	1,477 (97.24)	1,415 (96.32)	1,197 (85.81)	<0.001** *
Duration of breastfeeding, days (mean± SD)	88.4 ± 66.1	-	-	-
Introduction of complementary foods, n (%)	1505 (99.08)	-	-	-
<i>Dietary diversity and minimum acceptable diet, n (%)</i>				
Minimum dietary diversity (MDD) =>5 food groups	264 (17.38)	457 (31.11)	589 (42.22)	<0.001** *
Minimum meal frequency (MMF)	1,140 (75.05)	1,153 (78.49)	1,320 (94.62)	<0.001** *
Minimum acceptable diet (MAD)	64 (4.21)	433 (29.48)	568 (40.72)	<0.001** *

\*p<0.05, \*\*p<0.01, p<0.001

**Table 4. GMP service coverage in the WVB area**

<b>Indicators, n (%)</b>	<b>1<sup>st</sup> assessment (n=1519)</b>	<b>Follow-up (n=1486)</b>	<b>2<sup>nd</sup> assessment (n=1428)</b>	<b>p-value</b>
Child weight measured	680 (44.77)	717 (48.25)	68 (4.76)	<0.001***
The person who measured the child's weight (multiple responses)				
Family members/friends/relatives	25 (3.68)	16 (2.23)	27 (39.71)	<0.001***
Community clinic staff	70 (10.29)	25 (3.49)	13 (19.12)	<0.001***
World Vision staff	500 (73.53)	586 (81.73)	5 (7.35)	<0.001***
Others (hospital/clinic/drug store/other NGO or programme staff)	94 (13.82)	92 (12.83)	23 (33.82)	<0.001***
The place where the child's weight was measured (multiple responses)				
At home	208 (30.59)	245 (34.03)	28 (40.18)	0.124
Community Clinic	212 (31.03)	224 (31.24)	16 (23.53)	0.413
Other health facilities	75 (11.03)	97 (13.53)	20 (29.41)	<0.001***
Other places (EPI center, drug store, WVB clinic, etc.)	179 (26.32)	150 (20.92)	3 (4.41)	<0.001***
Reason for not measuring child's weight (multiple responses)				
Unaware of the service at CC	117 (40.63)	206 (36.01)	310 (37.3)	0.417
Child measurement is unnecessary	98 (34.03)	140 (24.48)	302 (36.34)	<0.001***
Child length measured	12 (0.79)	42 (2.83)	1 (0.07)	<0.001***
The person who measured the child's length (multiple responses)				
Family members/friends/relatives	-	-	1	-

<b>Indicators, n (%)</b>	<b>1<sup>st</sup> assessment (n=1519)</b>	<b>Follow-up (n=1486)</b>	<b>2<sup>nd</sup> assessment (n=1428)</b>	<b>p-value</b>
Community clinic staff	8 (26.67)	-	-	-
World Vision staff	4 (13.33)	42 (52.5)	-	-
<b>Places where the child's length was measured (multiple responses)</b>				
At home	1 (8.33)	18 (42.86)	1	-
Community clinic	10 (83.33)	13 (30.95)	-	0.004
Other health facilities	-	5 (11.90)	-	0.427
<b>Reason for not measuring the child's length (multiple responses)</b>				
Unaware of the service at CC	781 (53.2)	592 (42.32)	633 (45.64)	<0.001***
Child measurement is unnecessary	408 (27.79)	246 (17.58)	388 (27.97)	<0.001***
GM-specific counseling provided	369 (24.29)	485 (32.64)	7 (0.49)	<0.001***

\*p<0.05, \*\*p<0.01, p<0.001

**Table 5. Mothers/caregivers' knowledge attitude and practice on GMP programme in the WVB area**

Indicators, n (%)	1 <sup>st</sup> assessment (n=1519)	Follow-up (n=1486)	2 <sup>nd</sup> assessment (n=1428)	p-value
<b>Mother/caregivers knowledge of GMP</b>				
Ever heard about GMP	65 (4.28)	106 (7.13)	209 (14.64)	<0.001** *
Ever heard/seen a GMP card	1014 (66.75)	1081 (72.75)	1031 (72.2)	<0.001** *
Received GMP card	926 (60.96)	1019 (68.57)	1009 (70.66)	<0.001** *
<b>Knowledge of GMP card and growth chart</b>				
The mother/caregiver could explain the purpose of the GMP card	745 (49.05)	784 (52.76)	914 (64.01)	<0.001** *
The mother/caregiver knew the purpose of the child growth chart in the GMP card	967 (63.66)	742 (49.93)	203 (14.22)	<0.001** *
<b>The mother/caregiver mentioned the nutritional status of the child as per the growth chart</b>				
Malnourished	141 (9.28)	175 (11.78)	107 (7.49)	0.076
Normal	278 (18.3)	301 (20.26)	243 (17.02)	<0.001** *
Do not know	1097 (72.22)	1009 (67.9)	1077 (75.42)	<0.001** *
<b>Mothers/caregivers knew how to take care of their child as per the nutritional status (from growth chart interpretation)</b>	450 (46.3)	568 (54.72)	467 (45.74)	<0.001** *

\*p<0.05, \*\*p<0.01, p<0.001



**Table 6. Infant and young child feeding practices in the WVB area**

Infant and young child feeding (IYCF) practice indicators, (%)		1 <sup>st</sup> assessment (n=1519)	Follow-up (n=1486)	2 <sup>nd</sup> assessment (n=1428)	p-value
<i>Breastfeeding and complementary feeding status</i>					
	Exclusive breastfeeding, %	174 (14.4)		-	
	Breastfeeding (BF) in the last 24 hours, n (%)	1483 (97.63)	1432 (96.37)	1231 (86.20)	<0.001** *
	Duration of breastfeeding, days (mean± SD)	67.4 ± 65.25		-	
	Introduction of complementary foods, n (%)	1485 (98.08)		-	
<i>Dietary diversity and minimum acceptable diet, n (%)</i>					
	Minimum dietary diversity (MDD) =>5 food groups	370 (24.36)	567 (38.16)	679 (47.55)	<0.001** *
	Minimum meal frequency (MMF)	1212 (79.79)	1225 (82.44)	1345 (94.19)	<0.001** *
	Minimum acceptable diet (MAD)	62 (4.08)	541 (36.41)	652 (45.66)	<0.001** *

\*p<0.05, \*\*p<0.01, p<0.001

**Table 7. GMP service delivery during pre-COVID-19 and COVID-19-period**

Indicators, n (%)	WVB-supported service area				GoB GMP area			
	Pre-COVID-19 period (n=3005)	COVID-19 period (n=1428)	Total N=4433	p-value	Pre-COVID-19 period (n=2988)	COVID-19 period (n=1395)	Total N=4383	p-value
<b>Child weight measured</b>	1397 (46.49)	68 (4.76)	1,465 (4.76)	<0.001***	232 (7.76)	59 (4.23)	291 (6.64)	<0.001***
<b>The person who measured the child's weight (multiple responses)</b>								
Family members/friends/relatives	41 (2.93)	27 (39.71)	68 (4.64)	<0.001***	78 (33.62)	32 (54.24)	110 (37.80)	0.004
Community clinic staff	95 (6.80)	13 (19.12)	108 (7.37)	<0.001***	15 (6.47)	6 (10.17)	21 (7.22)	0.326
World Vision staff	1086 (77.74)	5 (7.35)	1091 (74.74)	<0.001***	-	-	-	-
Others (hospital/clinic/drug store/other WVBs staff)	186 (13.31)	23 (33.82)	209 (14.27)	<0.001***	138 (59.48)	21 (35.59)	159 (54.64)	<0.001***
<b>Child length measured</b>	54 (1.80)	1 (0.07)	55 (1.24)	<0.001***	3 (0.1)	-	3 (0.07)	-
<b>The person who measured child length (multiple responses)</b>								
Family members/friends/relatives	-	1	-	-	-	-	-	-
Community clinic staff	8 (14.81)	0 (0)	8 (14.55)	-	3	-	3	-
World Vision staff	46 (85.19)	-	46 (83.64)	-	-	-	-	-

Indicators, n (%)	WVB-supported service area				GoB GMP area			
	Pre-COVID-19 period (n=3005)	COVID-19 period (n=1428)	Total N=4433	p-value	Pre-COVID-19 period (n=2988)	COVID-19 period (n=1395)	Total N=4383	p-value
Others (hospital/clinic/drug store/other WVBs staff)	-	-	-	-	-	-	-	-
GM-specific counseling provided	854 (28.42)	7 (0.49)	861 (19.42)	<0.001***	1	-	-	-

\*p<0.05, \*\*p<0.01, p<0.001

**Table 8. Infant and young child feeding (IYCF) practices during pre-COVID-19 and COVID-19 period**

Infant and young child feeding (IYCF) practice indicators, (%)	GoB GMP area			WVB GMP area		
	Pre-COVID-19	COVID-19	P-value	Pre-COVID-19	COVID-19	P-value
Exclusive breastfeeding, %	21.4	-		14.4	-	
Breastfeeding (BF) in the last 24 hours	2892 (96.79)	1197 (85.81)	<0.001	2915 (97)	1231 (86.2)	<0.001** *
Duration of breastfeeding, days (mean± SD)	88.4 ± 66.1	-		67.4 ± 65.25	-	
Introduction of complementary foods	1472 (97.81)	-		1485 (98.08)	-	
<i>Dietary diversity and minimum acceptable diet, (%)</i>						
Minimum dietary diversity (MDD), ≥ 5 food groups	721 (24.13)	589 (42.22)	<0.001	937 (31.18)	679 (47.55)	<0.001** *
Minimum meal frequency (MMF)	2293 (76.74)	1320 (94.62)	<0.001	2437 (81.1)	1345 (94.19)	<0.001** *
Minimum acceptable diet (MAD)	497 (16.63)	568 (40.72)	<0.001	603 (20.07)	652 (45.66)	<0.001** *

## Disclaimer

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