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Community-Based Outpatient Therapeutic Program Implementation in Central Gondar Zone, Northwest Ethiopia: A Process Evaluation Using Access and Implementation Fidelity Frameworks

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ABSTRACT

Children with severe acute malnutrition have a 10-fold increased risk of death, diminished intellectual development and poor adult work capacity. Community-based outpatient therapeutic programs are among the key interventions designed to manage uncomplicated severe acute malnutrition at the community level in Ethiopia. Despite its implementation, evaluation involving multi-dimensional data sources such as health system level, service provider level and community level perspectives has not been made so far. A mixed-method evaluation was conducted in the central Gondar zone from January to May 2021. The OTP program is implemented by Ethiopian Ministry of Health. A total of 105 women/caregivers, 39 health posts, 171 health extension workers, and outpatient therapeutic program registration and reporting documents were included in the study. In-depth interview was conducted with seven HEWs and nine mothers/caregivers. Moreover, five key informants were selected from district officers and nutrition focal persons. Although more than half of the health posts had the required two HEWs, WHO weight-for-height reference cards, referral forms, length measuring boards and essential drugs were limited in most health posts. Close to a third (35.5%) of the HEWs were recording the routine-given medicine while the majority (98.8%) of them measured and recorded the children's Mid-Upper circumference. Sharing of RUTF for non-eligible children was the observed barrier to adherence to the program. The implementation status of the OTP program was poor. Some medicines were stocked out in all health posts. The majority of the mothers/caregivers didn't appropriately provide RUTF for their children. Improving resource availability, enhancing HEWs' compliance with the OTP protocol, and ensuring consistent counseling and regular home visits for mothers are recommended to improve recovery outcomes among children with malnutrition.

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Summary

- This study gathered data from several sources, including document reviews, observations, and interviews with key informants. By using both qualitative and quantitative methods, it offers a complete view for policymakers and program implementers.
- In the study area, Ethiopia's community-based outpatient therapeutic program (OTP) for treating uncomplicated severe acute malnutrition was not implemented well.
- Critical gaps in essential medicines, equipment, and supplies, alongside inconsistent adherence to OTP protocols by health extension workers, constrained service delivery.
- Inadequate caregiver counseling, home visits, and inappropriate sharing or uses of ready-to-use therapeutic food (RUTF) were important barriers to effective care.
- Strengthening health-system resources, provider adherence, caregiver counseling, and community follow-up is essential to improve OTP implementation and child recovery outcomes.

1 | Introduction

Childhood malnutrition encompasses stunting, underweight, wasting, severe acute malnutrition (SAM), and micronutrient deficiency (Uauy et al. 2012). Worldwide, throughout 2021, nearly 1.9 million under-five children suffered from acute malnutrition of which over 400,000 were severely malnourished (Portal 2021). Unlike other regions, Africa still has a high number of children with malnutrition (Joint 2021). About 57% of under-five mortality in Ethiopia is associated with malnutrition (Chamois 2011). Ethiopia's Demographic Health Survey 2024–2025 reported 40%, 18%, and 5% of children in the country were stunted, underweight and wasted, respectively (Adisu et al. 2026).

A child with SAM is at higher risk of acquiring different infectious diseases and death (Briend et al. 1989). Severely underweight and wasted children have a 10-fold increased risk of death compared to well-nourished children (Uauy et al. 2012). These children are also indicated to have diminished intellectual development, poor adult work capacity, and increased risks of diseases during their adulthood (Lenters et al. 2013).

Currently, a treatment program for SAM is offered as an outpatient therapeutic program (OTP) beside the inpatient therapeutic program to achieve rapid recovery and better coverage (Lagrone et al. 2010). The OTP provides services to severely malnourished children aged between 6 and 59 months. Children who have passed the appetite test with ready-to-use therapeutic food (RUTF), who do not have medical complications, and who fulfill the criteria for SAM are managed at the OTP (Ministry of Health 2019). A child admitted to the OTP gets a weekly amount of RUTF according to weight and appetite, routine medications such as vitamin A, folic acid tablets, antibiotic tablets, deworming tablets, and measles vaccine (Ministry of Health 2019).

The OTP program in Ethiopia was piloted in specific areas in 2004 and is being expanded across the country to every health post (HP) and health center (HC) (Briend and Collins 2010). Despite the unprecedented effort of the country to reduce childhood malnutrition, different evidence is still showing the higher burden of malnutrition among under-five children (Del and Joy 2008). Furthermore, studies conducted in South Ethiopia, Northwollo Zone, North Gondar, Somalia Region, and Jimma revealed that the recovery and defaulter rates of children from OTP were more than 14% far from internationally acceptable standards (Eklund and Girma 2008; Tesfalegn et al. 2010; Kabalo and Seifu 2017a; Mengesha et al. 2016; Tadesse et al. 2018; Abate et al. 2020; Mamo et al. 2019; Budul et al. 2020). A study in the Tigray Region showed that the recovery rate and weight gain among children treated in OTP programs were below the standards (Yebyo et al. 2013). Given that Central Gondar shares several contextual challenges with Tigray, including food insecurity, disruptions to health system functionality, population displacement, constraints in service accessibility, and the effects of recent conflict and increased dependence on humanitarian nutrition programs. Evaluating OTP implementation in Central Gondar is equally important. Such evidence is essential for identifying implementation gaps and informing context-specific policies and strategies to strengthen program quality and improve treatment outcomes (Gesese et al. 2021). These problems could also be associated with various factors, including the quality of the OTP service being provided in the community.

Well-implemented OTP reduces case fatality rates of malnutrition by facilitating the recovery rate and lowering defaulter in the program (Collins 2007). However, evidence from previous studies suggests that the expected outcomes of OTP were not achieved as defined by global sphere and WHO standards (> 75%) (Yebyo et al. 2013). This evaluation study will show implementation gaps by assessing the availability of resources, healthcare provider compliance to national standards, and mothers/caregiver acceptability of OTP services. Focusing on process indicators rather than relying solely on outcome indicators is essential in evaluating OTP implementation because process indicators explain how and why program outcomes are achieved. Outcome indicators such as recovery rate, defaulter rate and others reflect the end result of OTP; they don't reveal why this performance occurs, which helps identify effective interventions to prevent failures (Teshale et al. 2022). The findings are vital for policymakers, health program planners, OTP coordinators, and other key stakeholders to develop effective strategies to overcome the identified attributes and improve the OTP service to gain the intended outcome.

2 | Methods and Materials

2.1 | Evaluation Design and Settings

A cross-sectional evaluation with a mixed approach was employed from January to May 2021 in the health posts of the Central Gondar Zone. There are a total of 364,662 under-five children living in Central Gondar Zone. The zone has a total of 15 districts, 404 health posts, 75 health centers, 9 primary hospitals, and one comprehensive specialized hospital

(Nigusie et al. 2021). Children aged 6–59 months who were diagnosed with uncomplicated SAM were eligible for OTP, and their mothers/caregivers, health extension workers (HEWs), district nutrition officers, and health posts were the study population in this evaluation study.

2.2 | Descriptions of the OTP

Although mortality and morbidity associated with severe malnutrition might also be determined by broader factors such as food security, poverty, infection prevention, water and sanitation, maternal education, and access to preventive health services, evidences shown that CMAM programs have generally demonstrated good recovery outcomes when implemented according to protocol (Akuu and Amagnya 2023). Community-based Outpatient Therapeutic Program (COTP) brings uncomplicated SAM management services closer to the community through decentralizing and integrated treatment points within the primary health care (PHC) settings (HCs and HPs) where the use of RUTF, community outreach and mobilization had been undertaking. Children screened for malnutrition, diagnosed, admitted,

and treated based on the OTP protocol and their full recovery is the ultimate goal of the program (Yebyo et al. 2013). See program components (Figure 1). The number of children who died, defaulted, transferred out, and referred among those who were admitted to the program is considered as the negative outcome of the program (Mwima et al. 2025). Reduction of SAM incidence and prevalence, the child mortality rate due to SAM, and improving quality of life in society are the desired outcomes or impacts of the program (Adugna et al. 2025).

2.3 | Evaluation Approach and Dimensions

A formative evaluation approach was used focusing on the process theory of OTP. The program process theory consists of the program organization and services utilization plan (Rossi et al. 2003). Accordingly, the program's organizational plan was articulated from the perspective of the program management team that encompasses both the functions and activities the program is expected to perform and the resources required for that performance. Whereas the service utilization plan focuses on the critical assumptions about how

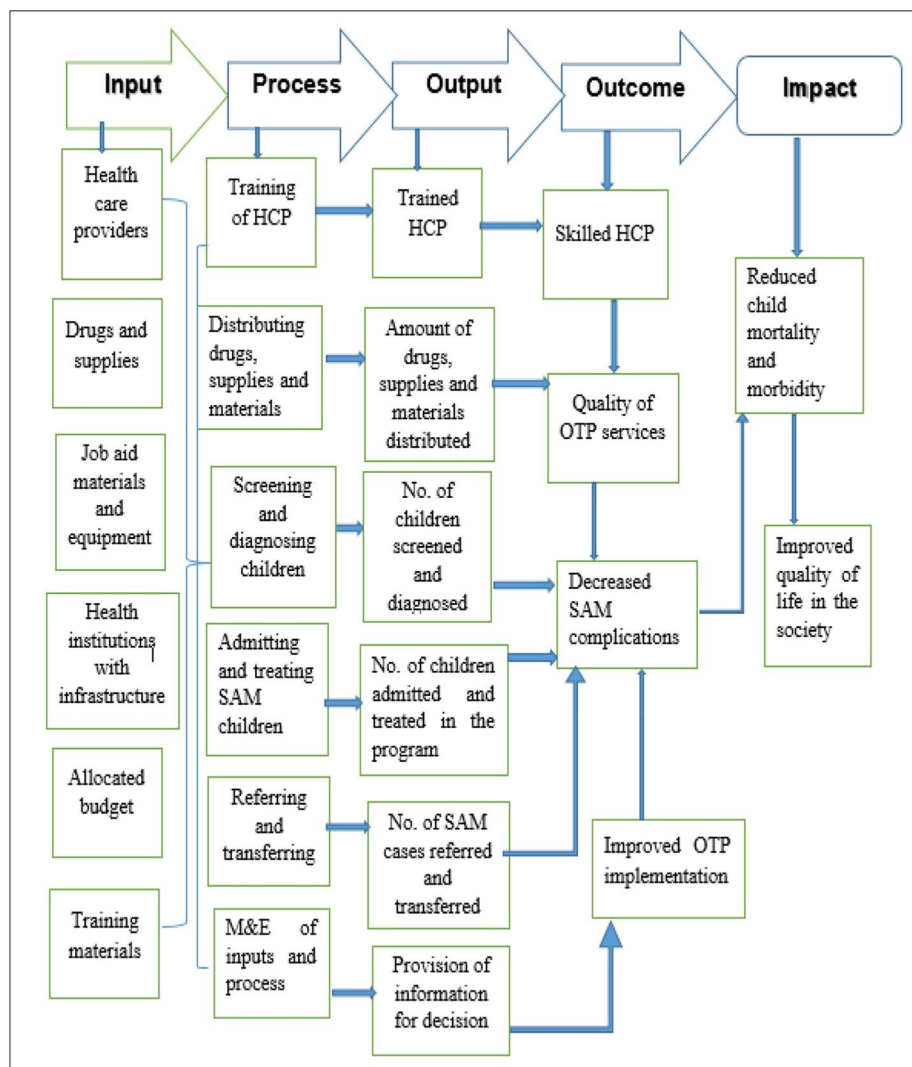


FIGURE 1 | Logic model for community-based outpatient therapeutic program (COTP) in Central Gondar zone, 2021.

and why the intended recipients of service delivery become engaged with the program and follow through to the point of receiving sufficient services to initiate the change process represented in the program impact theory. Accordingly, the focus of this evaluation was the program process theory, the availability and acceptability dimensions from the access framework (Penchansky and Thomas 1981) and the compliance dimension from the implementation fidelity framework (Carroll et al. 2007).

2.4 | Sample Size and Sampling Procedures

All mothers/caregivers with their children diagnosed with SAM, all HPs, and all HEWs in the selected districts were included in this evaluation study. In the first stage, three districts in Central Gondar Zone (Wogera, East Dembia and Gondar Zuria) were selected using a simple random sampling (SRS) technique security and transportation accessibility issues were considered when we applied SRS. Thirty-nine HPs (13 per district) were then selected by SRS too. Moreover, a total of 105 mothers/caregivers with their children diagnosed with uncomplicated SAM and 171 HEWs were enrolled, and 3 months of OTP documents and registries were used for quantitative data collection. To identify system-level and implementation-related perspectives on OTP performance, key informant interviews were conducted with program managers after participants were selected purposefully, based on their participation, knowledge about OTP, and level of engagement in the program implementation. Mothers/caregivers and HEWs were also selected for in-depth interviews to explore their experiences, perceptions, and challenges related to OTP service utilization at the community and household levels, and the interview was continued until new themes were no longer generated regarding the research questions. Accordingly, a total of seven HEWs and nine mothers/caregivers were involved in the in-depth interviews, and five key informants' interviews were conducted.

2.5 | Variables and Measurements

SAM is defined as very low weight-for-height/length (below -3 Z-scores of the WHO growth standards), and/or a mid-upper arm circumference (MUAC) < 11.5 cm, and/or the presence of bilateral pitting edema (UNICEF 2012).

Availability of resources was measured by checking the availability of guidelines, drugs, and other medical equipment required for the OTP program, including trained health care providers (HEWs). The availability of all resources was evaluated during the time of the visit and 6 months before the visit. For all the resources listed, we considered "yes," if the resources are available and functional both during the time of the visit and 6 months before the visit, otherwise "no." Moreover, the sustainability of available resources and service providers' commitment was explored through the in-depth interview of the HEWs.

Compliance was measured from the perspectives of both providers and service users. Compliance with providers' perspective is the adherence of healthcare providers to OTP guidelines and is measured through observation of patient-provider

interactions and document reviews. In this regard, a total of 14 essential tasks (See Table 2 of the results section) should be done while diagnosing and planning treatment for a child with uncomplicated SAM. Thus, HEWs were evaluated by whether they incorporated each task or not and their level of perfection in doing tasks as well. Accordingly, the checklist was filled as "yes" if the task was correctly done, otherwise "no" and this step was repeated for all 14 tasks.

Compliance from the service user's perspective was measured/ explored through interviews whether their child took the prescribed medicine; RUTF or not.

Acceptability of the program by the users was measured by using nine questions with a five-point Likert scale (1 = strongly unacceptable, 2 = unacceptable, 3 = neutral, 4 = acceptable and 5 = strongly acceptable). Those mothers/caregivers who scored above 67% of the total acceptability measuring tools were considered as accepted and the remaining were classified as not accepted.

2.6 | Data Collection and Quality Control

Multiple data collection tools were adapted from Ethiopia's evaluation of community management of acute malnutrition (CMAM) guidelines (World Vision International, Community-Based Management of Acute Malnutrition CMAM 2017) and other related literature. The quantitative data were collected from program documents, charts of the admitted children in OTP, and the mothers/caregivers during their exit time. A data extraction checklist was used to collect data from both registration books and children's OTP records. The tools for the quantitative data were prepared using an online platform, Kobo Toolbox, and the data were collected using Android tablets. A total of six data collectors and two supervisors were recruited from the University of Gondar Specialized Hospital. Qualitative data were collected by interviewing the district nutrition focal person, HEWs, and mothers/caregivers. The interview guide was prepared for each participant after reviewing relevant literature and using the guideline's recommendations. The interviews were done to explore the barriers and facilitators of program implementations at the HPs.

A structured interviewer-administered questionnaire was used to measure the acceptability of mothers/caretakers on OTP. Non-participatory direct observation was also conducted using structured checklist to collect patient-provider interaction (providers' actual behavior during counseling, clients' reflection); compliance of HEWs (observing whether HEWs follow admission and discharge protocols correctly, recording quality, child assessment competence, appetite testing, next appointment, client privacy and confidentiality, etc.). Qualitative data were recorded using a tape recorder, and filed notes were used to collect memos.

Expert-based face validation of data collection tools, selection of experienced quantitative and qualitative data collectors and supervisors, 2 days of training of field workers (data collectors and supervisors), and two experienced independent qualitative data coders were used to control the quality of data.

2.7 | Data Management and Analysis

The quantitative data were exported, cleaned, coded, and analyzed using Stata version 14.

The Qualitative data were analyzed using thematic analysis. Coding combined inductive insights from the data with deductive inputs from the study objectives. Two researchers independently coded the transcripts and resolved discrepancies through discussion. Codes were iteratively refined and organized into broader themes. Data saturation was reached when no new themes emerged. Reflexivity was maintained by acknowledging researchers' perspectives and their potential influence on interpretation.

2.8 | Ethics Statement

Ethical review, approval and clearance were granted by the Institutional Review Board (IRB) of the University of Gondar and an official letter of support was obtained from Central Gondar Zonal Health Department. Permission letter was also taken from each district health office and health facility. All methods were performed in accordance with the declaration of Helsinki. "Informed consent to participate was taken from parents/legal guardians of minor participants." Thereby, each respondent signed consent after a brief explanation of the risk and benefits of their involvement in the study. Participants were also informed about their right to withdraw from the study at any time they want and/or to skip questions that they are not comfortable to respond. Moreover, children diagnosed with complicated SAM were referred to the inpatient treatment center or therapeutic feeding unit for better health services and outcomes.

3 | Results

3.1 | Availability of Resources

About 21(53.85%) of the HPs had two HEWs who were trained on OTP. However, in 13 (33.3%) health posts (HPs), only one trained HEW was available and working at the OTP site during the observation.

As per the availability of human resources in health posts, the major problem was HEWs' intention to leave the profession and workplace. Most of the HEWs explored that the policy implemented on HEWs is discouraging them; there were no mechanisms of shifting from place to place, and there was also very limited educational opportunity. These conditions forced them to leave their profession which leads to raising the issue of good governance. "I have no hope I am thinking to be a merchant I have been working for the last 15 years at one Keble without rotation and educational opportunity. I am bored" (In-depth interviewee 03).

The finding showed that printed SAM protocols were not available in 36 (92.3%) of the HPs since HPs are not expected to have soft copies. The majority 25 (65.8%) of the HPs had SAM classification algorithm and ICCM protocol, OTP monthly statistics report form, immunization chart, OTP card, and MUAC classification table were available and functional in 36 (94.74%), 30 (78.95%), 32 (82.05%), 25 (64.10%), 27 (69.23%) of HPs, respectively. Moreover, WHO weight-for-height reference card, OTP quick reference, and

referral form were not available in 23 (58.97%), 22 (57.89%), and 36 (92.31) HPs, respectively. Although stockouts were reported in the majority of health posts, CMAM/OTP services continued to operate intermittently using limited remaining supplies, temporary redistribution of commodities from nearby facilities, and irregular replenishment from district health offices and partners. However, these shortages significantly affected the quality and continuity of service delivery, including adherence to OTP protocols and treatment outcomes.

Nearly 97% of HPs had functional MUAC tape and 32 (82.05%) of the HPs had functional weight scales. However, length measuring boards and standing meters weren't available in 37 (94.87%) and 33 (84.62%) of HPs, respectively. Regarding the infrastructure, of 39 HPs, only 18 (46.15%) had a safe drinking water supply.

All HPs were observed for essential drugs for a stock of 6 months (from September 01/2020 to February 30/2021). The RUTF, vitamin A, Amoxicillin capsule, and oral rehydration solution (ORS) were not available in 34 (87.18%) of the HPs in the past 6 months. Similarly, Amoxicillin syrup, Folic acid, mebendazole/albendazole, rehydration solution for malnutrition (ReSoMal), and hand-washing soaps were not available in 38 (97.44%), 25 (64.10%), 33 (84.62%), 39 (100%), 33 (84.2%) of the HPs, respectively in the past 6 months. At the time of observation, RUTF, vitamin A, amoxicillin capsules, amoxicillin syrup, folic acid, mebendazole/albendazole, ORS, and hand-washing soaps were available in 56.4%, 79.5%, 82.1%, 17.9%, 84.62%, 2.6%, 79.49%, and 46.15% of the HPs, respectively. In contrast, ReSoMal wasn't available in all health posts during the inventory (Table 1).

The majority of HEWs stated that there was an inequitable distribution and interruption of RUTF supply in Central Gondar Zone. In some HPs, we found that there was a shortage of RUTF while in others it was expired both of which are serious problems related to inequitable distribution of supply.

...We encountered scarcity of RUTF in our HP and children are suffering because of the shortage, but, HEWs from other HPs tell us they have too many expired RUTF this could be because of excess supply compared to the demand.

(In-depth interviewee HEW 02)

TABLE 1 | Availability of medicines and supplies of OTP program in the health posts of Central Gondar Zone, Northwest Ethiopia, 2021 ($n = 39$).

Drugs and supplies	Frequency	Percentage (%)
RUTF	5	12.8
Vitamin A	5	12.8
Amoxicillin capsule	5	12.8
Amoxicillin syrup	1	2.6
Folic acid	14	35.9
Mebendazole/ Albendazole	6	15.4
ORS	5	12.8
Soap for washing hand	6	15.4

3.2 | Compliance of HEWs and Mothers to the OTP Protocol

To measure the compliance of HEWs with the OTP protocol, we have evaluated using document review and observation of the 14 essential tasks that should be done by the HEWs during service delivery. In this regard, only a third (35.5%) of the HEWs have recorded the given medicine and the majority (98.8%) of the HEWs measured and recorded the children's mid-upper arm circumference (MUAC). Moreover, the HEWs went through all 14 tasks for 130 (76.2%) of the children at the time-of-service delivery. *"Most HEWs have skill gaps of using guidelines to measure body weight and administering medicines to SAM children such as vitamin A and folic acid, and, they don't apply what the guidelines say and recommends to do."* (A key informant no 04).

As the study findings indicated, there was an interruption of RUTF supplementation even without shortage. Some of the causes for the interruption of supply were associated with the health system and others were related to geographical and other natural factors that have an impact on the implementation of OTP.

During the winter season, the OTP service like other health care services is interrupted because, the local river is overflowing, making it difficult for the community to come here in the winter.

(In-depth interviewee 07)

Regarding the mothers'/caregivers' adherence to prescription, sharing of RUTF for non-eligible/not malnutrition children in the house was found to be the major challenge for the effective implementation of OTP in Central Gondar Zone. Mothers/caregivers stated that they gave RUTFs to

soothe a crying baby and as a reward for the child doing housework. *"Sometimes, I give the plump nut to the older baby while he/she starts crying."* (In-depth interviewee mother 07)

"Some mothers haven't shared the RUTF with other children because they thought it is only given for small children ..." *"I don't give for other children because they are older enough"* (in-depth interviewee mother 03).

Moreover, at a program implementation level, 26.8%, 96.5%, 98.0% and 96.5% of the HEWs identified the defaulters for follow-up, dispensed RUTF at working hours, sent reports monthly to the next level, and prepared the monthly statistics, respectively (Table 2).

3.3 | Acceptability of OTP Services

3.3.1 | Socio-Demographic and Economic Characteristics of Respondents

The mean age of mothers/caregivers was 32.5 (SD $\pm$ 8.06) years. The majority (28.6%) of caregivers/mothers were between 31 and 35 years. Nearly 60% of children were female. Among the total caregivers, 92.03% were married; 93% were female. The majorities (84.5%) of participants were Orthodox by religion, and (89.3%) were married. Regarding educational status, about half (52.1%) of caregivers were unable to read & write. Moreover, nearly two-thirds of the caregivers (62.6%) were housewives (Table 3).

3.4 | Acceptability of OTP

More than four-fifths (85.75 (95% CI: 78.9%–92.5%)) of the mothers/caregivers have accepted the OTP program (Table 4).

TABLE 2 | Tasks done for a child eligible for OTP in the health posts of Central Gondar Zone, Northwest Ethiopia, 2021 ($n = 171$).

Expected activities	Checked	
	Frequency	Percentage (%)
Bilateral pitting edema is measured and registered	151	88.3
Mid-upper arm circumference (MUAC) is measured and registered	169	98.8
The weight of a child is measured and registered	167	97.7
Height/length of a child measured and registered	111	67.3
The medical complication is registered	162	95.3
Admission is according to the correct criteria	164	97.0
The child's appetite is tested upon admission and during OTP follow-up sessions is registered	153	91.6
Child classified appropriately	157	93.5
History and physical examination are recorded accurately on the OTP Chart	86	50.3
The date of admission and discharge were recorded appropriately	156	91.8
Routine given medications are recorded accurately	60	35.5
The amount of RUTF needed is correctly calculated	125	74.4
The OTP registration book is completed correctly	83	48.5
Beneficiaries are discharged according to the protocol	81	47.4

TABLE 3 | Socio-demographic and economic characteristics of respondents in Central Gondar Zone, Northwest Ethiopia, 2021 ($n = 105$).

Variables	Frequency (n)	Percentages (%)
Mothers/caregivers' characteristics		
Mothers'/caregivers' age (in years)		
18–25	24	22.8
26–30	22	21.0
31–35	30	28.6
35+	29	27.6
Family size		
< 5	22	21.0
5+	83	79.0
Monthly income (in Ethiopian birr)		
< 33807	76	72.4
33807+	29	27.6
Religion		
Muslim	2	1.9
Orthodox	103	98.10
Number of previous pregnancies		
< 3	29	27.6
3+	76	72.4
Number of live births		
< 3	27	25.7
3+	78	74.3
Marital status of mothers'/caregivers'		
Married	97	92.4
Other*	8	7.6
Residence		
Rural	100	95.2
Urban	5	4.8
Mothers'/caregivers' educational status		
Not attended formal education	76	72.4
Attended formal education	29	27.6
Child characteristics		
Sex		
Male	43	40.9
Female	62	59.1
Child's age (in months)		
< 24	69	65.7
24+	36	34.3

Note: Others*: single, divorced and widowed.

4 | Discussion

In this study, a formative approach with (availability and acceptability dimensions from the access framework and compliance from the implementation fidelity framework) was used to evaluate the implementation of OTP in Central Gondar Zone, 2021. Accordingly, we found that the compliance was 76.2%, acceptability was 75.75%, but poor availability of resources was identified;

The majority of the supplies and medicines (Amoxicillin syrup and/or capsule, RUTF, ORS) were sufficiently available for less than 13% of the HPs. This shows the majority of under-nourished children lost the opportunity to be treated in out-patient treatment centers, might have worsened health conditions due to treatment delays, and face unnecessary expenses by traveling long distances to get the service. This finding was substandard compared to the national OTP guideline that recommends having all the essential drugs and

TABLE 4 | Acceptability of OTP for mothers/caregivers in Central Gondar Zone, Northwest Ethiopia, 2021 (*n* = 105).

Acceptability measurement items	Acceptability scale				
	Strongly disagree <i>n</i> (%)	Disagree <i>n</i> (%)	Neutral <i>n</i> (%)	Agree <i>n</i> (%)	Strongly agree <i>n</i> (%)
Sharing the RUTF with other family members is recommended	69 (65.7)	18 (17.2)	6 (5.7)	7 (6.7)	5 (4.7)
Comfortable offering RUTF for children	2 (1.8)	3 (2.9)	1 (1.0)	31 (29.5)	68 (64.8)
HEW approach is friendly	0 (0)	8 (7.6)	4 (3.8)	39 (37.1)	54 (51.5)
Reasonable time spent on the services	1 (1.0)	10 (9.5)	2 (1.8)	44 (41.9)	48 (45.8)
Appointment day for the child given by HEW	2 (1.8)	9 (8.6)	4 (3.8)	45 (42.9)	45 (42.9)
Provision of correct instruction on how to prepare by HEW's	2 (1.8)	15 (14.3)	0 (0)	35 (33.3)	53 (50.6)
Provision of correct instruction on how to feed by HEW's	3 (2.9)	3 (2.9)	1 (1.0)	43 (40.9)	55 (52.3)
Working hours schedule suitable	0	8 (7.6)	2 (1.8)	48 (45.8)	47 (44.8)
Provision of good education for the mothers about the child malnutrition	4 (3.8)	24 (22.9)	3 (2.9)	30 (28.6)	44 (41.8)
Overall acceptability			90 (85.75)		

medicines at the HPs to manage moderate acute and uncomplicated SAM. The gaps for the stock-out might be associated with poor planning distribution, poor stock management practices and poor communication. The findings were incongruent with the study conducted in Southern Ethiopia which showed better availability of resources (RUTF (32.9%) and antibiotics (62.9%)) (Tadesse 2016). The possible reason for this variation might be the differences in road and transportation problems (Puett and Guerrero 2015). The qualitative finding that we found from HEWs regarding unpleasant road, transportation inaccessibility can be taken as strong evidence for the differences. The HEWs have also stated that distribution of RUTF and other supplies is the main reason for the observed low availability. Based on their explanations, there have been allocations based on available stock rather than facility demand, transportation and distribution challenges, delayed deliveries, and periodic supply disruptions. Consequently, facilities often received quantities below their reported needs, resulting in inequitable distribution and intermittent stock shortages.

The availability of other essential materials, including the SAM classification algorithm, ICCM protocol, monthly report format, OTP card and MUAC classification table, was 65.8%, 94.7%, 78.9%, 64.1%, and 69.2%, respectively. The availability of these supplies in this study was lower than in a study conducted in Uganda (100% available) (Wanzira et al. 2018). This could be due to limited infrastructure; in our study area access to electricity for printing forms and preparing guidelines was difficult. Political instability might also be another reason for the lower supply of resources since there have been conflicts which may cause population displacement, service disruptions and security problems close to some of the HPs under study. As a result, basic health services delivery, including OTP, was disrupted along with limited resource supply missing client appointments and follow-up; HEWs may feel discomfort and instability then their probability of absenteeism also increased. The findings and the possible reasons mentioned for the availability of resources could provide information to build a resilient health system to absorb healthcare emergencies.

The compliance of HEWs with the OTP guidelines was 76.2%. The finding was in line with the study done in Uganda (77.7%) (Wanzira et al. 2018). Low compliance of HEWs might be explained by a lack of refreshment training and poor assistance from their higher officials. Moreover, the shortage of some basic materials needed for the implementation of the OTP program might result in poor compliance of the HEWs to the treatment standards and lowers their performance.

In this evaluation study, only 88.3%, 97.7%, 67.3%, 98.8%, 95.3%, and 91.6 36.5% of under-five children's nutrition status were assessed using bilateral pitting edema, weight, height, MUAC, medical complications, and appetite test, respectively. This result was slightly lower than an evaluation study in Mali and Uganda (checked for weight (100%) and height (100%)) (Moran et al. 2018). This could be due to the availability of measuring instruments; for instance, a stadiometer or height measurement tape were not available in the majority of HPs included in our study area. However, the availability of antibiotics, RUTF, and vitamin A in this study were higher than in an evaluation done in Wolaita Zone, Ethiopia (Kabalo and Seifu 2017b). The reasons for this variation could be that the program is currently

mature enough and that the government and NGOs might give priority to these nutritional programs.

The qualitative findings stated by mothers/caregivers indicated that they didn't use the RUTF as prescribed; Mothers/caregivers share RUTF for another child for different reasons like other foods as a cultural norm and household food insecurity. Sharing of RUTF ultimately reduces the effectiveness of the treatment for the child receiving the service as well as the program's effectiveness in general. This scenario implied that distributing the RUTF by itself can't be a guarantee for the program's effectiveness; hence, counseling of mothers/caregivers and active supportive supervision at the household level could also be required.

The overall acceptability of the OTP was 85.7%, which was less than the guideline recommendation that stated all beneficiaries should accept the program for their child. This might be the residence of the participants; all the mothers/caregivers interviewed in this study were from rural areas and the majority of them didn't attend any form of education. On the flip side, the result of this study was relatively higher than the findings in Southern Ethiopia which indicated the level of acceptability to be 60% (Tadesse 2016).

4.1 | Strengths and Limitations of the Study

Some variables identified qualitatively like HEWs demotivation and turnover were not measured quantitatively (were not considered at the quantitative design stage); however, our study used data from different sources such as document review, observation, and key informant interviews and in-depth interviews using both qualitative and quantitative approaches. This provides a full picture for policy makers and program implementers.

Author Contributions

C.T.T. conceived, designed the research and participated in result writing. A.D. participated in designing and commenting on the manuscript. G.M.K. commented on the manuscript. E.G.M. participated in designing the research and commented on the manuscript. W.W.T. participated in the discussion part and commented on the manuscript. A.T. commented on the manuscript. A.D.A. participated in manuscript drafting and commented on the manuscript. T.G.H. drafted and commented on the manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. All the data supporting

the findings are within the manuscript. Additional detailed information and raw data are available from the corresponding author on reasonable request.

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