

# Evaluation of Integrated Community Case Management of Common Childhood Illness Program: Quality of Program Implementation in Hadiya Zone, Ethiopia

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**Abstract:** *Background:* Integrated community case management of common childhood illnesses (ICCM) is life saving curative health service delivery for common childhood illnesses (CHI) at health post and community level before developing a complication. ICCMCHI quality has little information in the study area. *Methods and Materials:* The focus of this evaluation was to evaluate the process of ICCMCHI program, and the approach of this evaluation was formative. Availability of program resources, compliance of health extension workers with ICCM guideline and acceptability of services were the dimensions of this study. The case study was conducted with both quantitative and qualitative data. Fifty-seven health posts were included from three woreda of the zone by deviant sampling techniques. For qualitative data health extension workers and health care managers were included. Data was analyzed by using SPSS soft ware version-20. Univariate, bivariate and multivariate logistic regression were used for quantitative data, and qualitative data was analyzed by using thematic analysis. *Result:* Compliance was 76% which is good even though most of health extension workers (HEW) were missing opportunities and identified reasons were an inadequate use of ICCM chart booklet and poor supportive supervision. 423 mothers or caregivers with sick under-five children were interviewed from 57 health posts. The mean score of client satisfaction on the quality of ICCM services received was 48.97. Satisfaction of caregivers with a mean score of client satisfaction on quality ICCM services was associated with primary level education, family annual income of and Muslim religion and received information about when to return for next revisit were found to be more likely to satisfy on the quality of ICCM services provided. *Conclusion and Recommendation:* Quality of ICCMCHI program was evaluated as good. There was an inadequate level of resource availability. Client's satisfaction with integrated community case management of common childhood illness services was also good. All concerned bodies from local government and development partners are expected to strengthen regular supportive supervision, clinical mentoring, and continues performance review.

**Keywords:** ICCM, Childhood Illness, Client Satisfaction, Quality of Service

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## 1. Introduction

Every year some 8 million children in developing In developing countries 8 million children died before the celebration of fifth birth day, most of this death are occurred before the first year of life. Acute respiratory infections mostly pneumonia, malaria, diarrhea, malnutrition or a combination of these accounts for 80 percent of deaths [1].

According to the world health organization (WHO) report, in developing country children under 5 years old is 30% of the global burden diseases. 99% of deaths occurs in developing countries [2].

Half of the developing countries death are cooccurred in the Sub-Saharan countries' region of Africa [3]. The highest infant mortality rate in the sub-Saharan countries are due to diarrhea, pneumonia, and malnutrition [4]. Community case

management (CCM) for childhood diseases is a strategy to deliver lifesaving curative intervention for CCHI, in particular where there is little access to facility-based services [5].

Since 1995, many countries introduce the integrated management of childhood illness strategy. IMNCI in community, health facility and health system level in combination for delivery of essential intervention has a major strategy for child survival, healthy growth and development. IMCI includes elements of prevention as well as curative and addresses the most common conditions that affect young children. The strategy was developed by the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) [6].

Globally ICCM gets a top policy support from donors and health development partners and agencies, and it becomes an increasingly popular strategy to save the life of the children of underserved communities [7].

ICCM in developing countries specially in Africa are still in the infantile stage of in the preliminary stage and working to introduce single disease at a time and focusing on advocacy activities. Some countries in Africa like Senegal, Rwanda, Democratic Republic of Congo, Niger, and Madagascar, begun to implement the approach at a national level [8].

Ethiopia started national scale-up of ICCM of childhood illness to accelerate MDG 4 attainment since February 2011. Currently under the leadership of FMOH and RHBs, and strong partnership with development partners the program is launched for implementation [9].

Despite the under-five mortality reduction strategies are in progress, 75% of the under 5 years children mortality are still due to the causes like diarrhea, pneumonia, malaria and newborn conditions. The appropriate treatment of diarrhea, childhood pneumonia, and malaria are one of the most potent interventions to reduce child mortality [10].

Our country has achieved MDG4 by reducing under five-year mortality from 204 per live births in 1990 to 68 per live births in 2012. The last EDHS 2011 data showed that there was a reduction of under-five year mortality from 166 to 88 deaths per 1000 live births over the 15 years between the 2000 EDHS [1]. The success of the program requires the availability of HEWs; whether HEWs are trained in ICCM; supportive supervision; continued availability of drugs and supplies; and demand generation activities. The adequacy of program inputs, processes and outputs need to be assessed early after the inception of the program to ensure that necessary adjustments and corrections are made [11].

In the world, around 6.6 million children die before celebrating their fifth birthday each year. From these deaths, one third are due to pneumonia, diarrhea and malaria which are preventable. Every day in the world, an average of 26,000 and more children under the age of five are died. Since 1990 globally planned to reduce child deaths and it still implies 17,000 deaths of under five children every day in 2013. The majority of children deaths occurred in 60 developing countries, 16 of the Sub-Saharan countries are occupied half of the deaths [12].

In every 20 seconds in developing countries, a mother and

father lose their young children due to preventable diseases of diarrhea, malaria, and malnutrition. India, Ethiopia, Democratic Republic of the Congo, Angola, China, Afghanistan, Kenya, Sudan, Niger, Bangladesh, Chad, and Uganda are the 15 highest burden countries with limited progress towards the reduction of child mortality [13].

As WHO cited it, the global burden of diseases indicates that this condition will continue to be the most challenging health problem in children until 2020 if continued without tackling them by designing some effective strategies. According to WHO, during the past twenty years millions of parents taking their children to first level health facilities like clinics, health centers and outpatient departments of hospitals with potentially fatal diseases. Of these problems, three out of four of the problems were among the major five cause of morbidity & mortality in children [14].

Ethiopia is one of the countries among Sub-Saharan Africa living below the poverty line and among the one to ten ranked countries in childhood mortality due to the five causes of childhood mortality diseases. In Ethiopia, one in every 17 children dies before celebrating their first birthday, and one in every 11 children dies before celebrating their fifth birthday. The national HSDP IV planned to attain a reduction of under five years. The children mortality rate of 67/1000 live birth and also our country signed the Millennium Development Goal target to reduce Children mortality to less than 63/1000 live births. The data showed a child mortality rate in Ethiopia was 88/1000 live births in 2011. Only one year is left to measure the achievement of MDG target; it is extremely challenging country's past track record [15].

Some improvements are observed in under five children's mortality in Ethiopia the level of the under-five mortality differs by level of mothers education, house hold income category, and place of residence. Studies shows that newborn infections like pneumonia, under nutrition's, malaria still kills 205,000 under five children's each year. Ethiopian demographic health survey (EDHS) in 2010 shows that the under-five mortality rates are higher among children from low-income families than those from more prosperous families [16].

A study conducted on developing countries shows that the use of interventions like antibiotics for pneumonia, anti-malarial for malaria, oral rehydration packets and zinc for diarrhea and plumpy nut for severe acute malnutrition is low because services that deliver them are not available, not of good quality, and/or not sought. Curative interventions must be continuously available because children acquire infections unpredictably and can rapidly deteriorate and die without treatment especially those in rural areas, live beyond the reach of facilities. Indeed, facilities only treat a minority of most sick children in developing countries. Preventive interventions are an incomplete solution without curative interventions because use and efficacy will be incomplete [17].

Study associates the implementation of ICCM program with the availability of program resources pre-determined standards. Implementation of ICCM program can be affected by the availability of program resources like trained health

care providers, availabilities of supplies and medications as per standard. With out the fulfillments of trained human resources and supplies ICCM programs risk uneven roll out and disappointing results. In the study health facility, the primary constraints of ICCM implementation were lack of continuous and sufficient supplies of essential medicines at health posts (HPs). In SNNPR from 11 health posts assessed for drug availability, only 2 HPs have coartem [18].

Despite unavailability of information related to implementation of ICCM program in the ethiopia in general and SNNP region in particular, lack of continuous and sufficient supplies of essential medicines and its chain management, variability in quality of supervision by primary health care unit (PHCU) and district, weak referral linkage, turn-over of HEWs, gaps in skilled human resource (HEWs), Poor care-seeking for maternal and postnatal services and neonatal illnesses; lack of indicators related to ICCM in national HMIS and routine monitoring systems and quality problem in record keeping and reporting were identified as the major challenges [18, 19].

The first six months plan performance report of 2014/15 in Hadiya zone shows that unexpectedly very low coverage of ICCM targeted illnesses like diarrhea, pneumonia, and malaria which are 38%, 32% and 37% respectively [20]. The reason may be structural and process-related factors which contribute for very low implementation of ICCM program. However, there is not any scientific inquiry conducted on the implementation status of ICCM program in the study area. Therefore evaluating the quality ICCM program implementation with its objectives perspective will contribute in the improvement of this program to achieve the reduction of children mortality rate. So the intention of this evaluation will be to evaluate the quality of ICCM program implementation in Hadiya zone.

The result of this evaluation will be used by higher officials in ministry of health, program designers and local health managers as well as other stakeholders working on the program as baseline information to improve the program implementation for further benefit of the program beneficiaries. Further, it can also serve as baseline information for researchers of the country, for the reason that little was known about the new program initiative in the country. This information will also be useful to other countries that are implementing large-scale community-based newborn and child-health interventions as new strategy and priority are given by government and other Non-governmental partners.

Ministry of health pf Ethiopia planned to scale up ICCM program at the national level, there is a challenge in accessing HPs due to low health care seeking behaviour of the community particularly during the first two months of life. The reason for this is being cultural issues and interruption of some supplies such as zinc. The risk of death is highest for children in populations with limited access to health facilities which is indicated by low coverage of most needed interventions resulting in unmet need for treatment of major causes of child mortality: Pneumonia, Diarrhea, and Malaria [2, 18].

Another challenge of ICCM implementation in Ethiopia is skill gap among health extension workers because of the curriculum they were trained only for one year in focused on prevention of disease rather than treatment. In Ethiopia children's with severe disease are are not managed properly and only 34% with pneumonia, 39% with diarrhea and 30% with suspected pneumonia are get antibiotic treatment properly [18, 19].

### **1.1. Program Goal**

To reduce under-five children morbidity and mortality due to the major causes of childhood mortality diseases in Hadiya zone.

### **1.2. General Objectives**

- 1) To reduce morbidity and mortality associated with major causes of diseases in less than five years of age.
- 2) To contribute for the healthy growth and development of under-five children.

The strategies of ICCM include three primary mechanisms:

- 1) Improving the case management skills of health extension workers.
- 2) Improving the health systems.
- 3) Improving the family and community health practices [22].

### **1.3. Program Input/Resource**

The input for this programs are people, money, information from outside of the program (21).

### **1.4. Activities of the Program**

These are the actions mounted by the program and its staff to achieve the desired outcomes in the target groups. Activities will vary with the program [21].

### **1.5. The Output of the Program**

*“Outputs are the direct products of activities, usually some sort of tangible deliverable. Outputs can be viewed as activities redefined intangible or countable terms. They are usually the immediate results of using the program resources” [23].*

The output of the ICCM program in the study area includes: Number of HEWS trained, Amount of budget allocated, Number of children assessed and classified for common childhood illnesses, Number of children tested for malaria, Number of the malnutrition children tested for appetite, Number of children treated with medicine, Number children, received follow up visits, Number of care givers counselled for food, fluid and when to return back for follow up, Number of health posts with functional ORT corner. Number of HPs/HEWs received ISS, Number of HPs/HEWs participated in review meetings, The number of children whose weight and MUAC is measured, Number children admitted to the OTP program, Number children discharged from OTP program, Number of defaulters traced, Number of

on-time reports sent to next supervisory body, Number of complete reports sent to next supervisory body, Number of children referred.

### **1.6. The outcome of the Program**

Outcomes are the changes in someone or something, it is the effect of the program on the target beneficiaries [23]. The outcome of the program includes Improved health seeking behaviour, Improved adherence to the program, Improved service quality, Improved quality of data.

### **1.7. Impact of the Program**

Impact of the program is usually long-term effect of the program on the whole society rather than the target beneficiaries of the program [23]. The impact of the program includes reduction of child morbidity and mortality due to diarrhea, pneumonia, malaria and malnutrition.

### **1.8. Program Development at the National Level**

In Ethiopia the health extension program (HEP) planned to deliver 16 packages of health services, including health promotion, hygiene and sanitation immunization of childrens and mothers, family planning service, and other disease prevention measures, and a limited number of high-impact curative interventions, in order to address the main causes of maternal, neonatal and child morbidity and mortality. By looking at the success of preventive packages, the government of Ethiopia was planning to expand curative interventions by integrating to health extension programs. ICCM was among planned curative intervention by health extension workers. It was started as pilot program in SNNPR, Wolayta zone, Bolosore woreda from 2006 to 2008. After testing the operational feasibility of ICCM including pneumonia treatment by HEWs, FMOH was formally adopted as policy in late 2009. The decision by the Ethiopian MOH in 2009 to allow Health Extension Workers to provide CCM of pneumonia was the result of a complex policy development process [4].

In the contrary to the international and local evidence demonstrating the feasibility and effectiveness of community case management of pneumonia, the MOH was hesitant to adopt the program. After a group of 25 Ethiopian policy makers visited India to study their home-based newborn care program in October 2009, and following the visit to India, a critical mass of supporters among federal and regional policymakers and program managers emerged. The decision to introduce CCM pneumonia was also influenced by pressure to meet MDG4. Finally, implementation of CCM pneumonia was linked to the introduction of pneumococcal vaccination. The process of approving CCM pneumonia in Ethiopia demonstrates the multifactorial nature of the policy process and the importance of understanding the local context in addition to using scientific evidence and other stakeholders to take advantage of windows of opportunity to make policy changes [3].

## **2. Method**

### **2.1. ICCM Program Development at Hadiya Zone**

Following the action plan Hadiya zone started training for HEWs, professionals from health institutions, health extension supervisors and woreda health office expertise step by step in February 2011. At the end of training, each woreda health office and health facility prepared an action plan to start the implementation of the program at the health post level. Hadiya Zone Health Department in collaboration with Integrated Family Health Program (IFHP) stated the implementation of ICCM program in July 2011. This was accomplished through training existing HEWs in case management, assuring medicine availability, supporting structured supervision, mobilizing demand through community volunteers. Currently, the ICCM program is at the implementation level at 305 rural health posts in Hadiya zone [24].

### **2.2. Evaluation Questions**

During the meeting with the main collaborative ICCM stakeholders, the following evaluation questions were proposed for the evaluation of the ICCM program.

- 1) Are all necessary program resources available to provide ICCM services in Hadiya zone? If yes how? If not why?
- 2) Do health extension workers providing ICCM services congruence with the national ICCM guideline in Hadiya zone? If yes how? If not why?
- 3) Are the caregivers satisfied with the care given to ICCM cases in Hadiya zone? If yes how? If not why?

This study was conducted in Hadiya zone from February 25, 2015-March 25, 2015. Hadiya zone is one of 13 zones in SNNPR, which is located 235 kilometres from Addis Ababa, the capital city of Ethiopia, and 194 kilometres from the regional city, Hawassa. It is bordered by Gurage Zone in the North, SilteZone in the East, Kembata zone, Wolaita zone & Alaba special woreda in the South, Yem Special Woreda & Oromia region in the west.

The zone includes one town administration and ten woredas with 305 rural kebeles and 24 urban kebeles. According to the 2014/15 data the zone has a total population of 1,594,950 (8.7% of the SNNPR population) from which Male 789,022 (49.47%), Female 805,928 (50.53%) with 325,500 (4.9%) households. The expected under-five children are 248,812. The zone has one general hospital, 63 health centers, 305 health posts which are public, and there are one higher clinic, 16 middle clinics and 64 lower clinics, three pharmacies, 17 drug stores and one diagnostic laboratory, which are private [20].

### **2.3. Evaluation Approach**

Formative evaluation is process oriented and involves a systematic collection of information to assist decision-makers during the planning or implementation stages of a program, and often it begins during program development and

continues throughout the life of the program. It uses evaluation methods to improve the way a program is delivered. It is conducted with the intention of improving a program through information gathered [25, 26]. So a formative evaluation approach was used with the intention of improving the strategy to make decisions about the quality of ICCM program improvement in Hadiya zone. By using the recommendations of the evaluation, the implementation strategies of the program will be improved. Moreover, additional strategies applicable at local level that help to improve implementation of the program will be redesigned and applied.

#### 2.4. Evaluation Design

A mixed method study design of quantitative and qualitative data was conducted for the purpose of depth understanding and validation. It also helps to explain quantitative findings (When findings don't make sense or results are not understood or not complete by using only quantitative data). By using this design, it is possible to understand the degree of implementation of ICCM program in Hadiya zone. The case study design also helps to answer the evaluation questions by digging data retrospectively [27]. By taking all the above advantages a case study design was found to be the best and then complemented by a survey of clients to assess clients satisfaction with the services that were provided by Hadiya zone health posts.

*The focus of evaluation:-* Process evaluation is a type of evaluation used to examine the operations of the program, including which activities are taking place, who is conducting the activities and who is reached through the activities. It also used to assess whether input or resources have been allocated or mobilized and whether activities are implemented as planned. Further it also helps to identify program strength, weakness and areas that need improvement, testing if a theory behind a program works as it is assumed by actors, describe implementation process and helping to improve that theory and implementation before, during or after its implementation [28].

The focus of the evaluation was processed and includes some immediate outcome components (satisfaction). It focuses on program inputs, activities, and output.

*Evaluation dimensions:-*The Dimensions of the evaluation were compliance, availability, and acceptability of ICCM program. These dimensions help to measure the quality of ICCM Program in-line with the predetermined national objective and goal of the ICCM program. This was assessed by using the Donabedian model (Structure-Process-Outcome) [29].

For each dimensions indicators to be measured were identified in collaboration with key stakeholders of the program. Moreover, the weight for each of the indicators under the dimensions was given based on their relative relevance during an Evaluability assessment, and actual values were obtained for each indicator under the corresponding dimensions.

*Indicators of Evaluation:-* "Indicators are signals that reveal progress towards objectives; means of measuring

*what actually happens against what has been planned in terms of quantity, quality and timeliness*". To ensure that the findings of the evaluation to be used at the end; the indicators should have to be selected by involving key stakeholders of the program [30]. Accordingly, during Evaluability assessment (EA), the following indicators were selected in collaboration with key stakeholders of the program.

- 1) To measure the availability of program resource =25 indicators
- 2) To measure compliance dimension = 22 indicators
- 3) To measure the acceptability of ICCM services = 13 indicators

#### 2.5. Study Population

- 1) Selected health posts providing ICCM services in Hadiya zone.
- 2) Health extension workers in selected Health posts of Hadiya zone
- 3) Under-five children caregivers in selected health posts in Hadiya zone visiting health post during data collection period for exit interview for quantitative data.
- 4) Selected heads of health centers comprising of Health posts providing ICCM services in Hadiya zone
- 5) Selected DPHP coordinators in Woreda health offices of Hadiya zone
- 6) Head of the Zonal health department

Sample size determination: -Hadiya zone has ten rural woredas and these rural woredas encompass 305 health posts. Of those rural woredas, a total of three woredas (best performer, medium performer and low performer woreda) were selected by using deviant sampling techniques. ICCM program implementation indicators which were developed for woreda health office during EA together with stakeholders for the first half-year were taken to measure the level of performance of each woreda. All health centers of selected woreda (nineteen health centers) were included. After including all health centers of selected woreda, three health posts from each corresponding health center were selected by using deviant sampling techniques (high performer, medium performer and low performer health post). ICCM program implementation indicators which had been developed for health post during EA together with stakeholders for the first half-year were taken to measure the level of performance of each health post. So, 57 health posts were included in the evaluation study.

The sample size for document review:- All under- five children registered on ICCM register in selected health posts from March 2014 to February 2015 were included in the evaluation.

The sample size for direct observation:- Eight ICCM cases per HEW attending selected health posts during data collection period were observed. From these eight cases, three of them were dropped during analysis to minimize Hawthorne effect. So, a total of 570 direct observations of ICCM cases were used in the analysis.

Single population proportion was used to compute the sample size for an exit interview, by taking prevalence of

satisfaction of ICCM service quality  $p=50\%$  because there was no previously done study on the satisfaction of caregivers on ICCM and standard error was considered to be  $d=0.05$  at 95% confidence interval.

$$N = (z\alpha/2pq)/d^2$$

$$= (1.96)^2 (0.5) (.5)/(0.05)^2$$

=384 and by adding a non-response rate of 10%, the total sample size was 423

Data quality assurance: -The following activities were done to ensure the quality of data. The questioners for exit interview were pre-tested in 5% [21] of the sample size in non-selected health posts. During data collection, questionnaires were checked for consistency and completeness, Training were provided for data collectors, regular supervisions were conducted by supervisors and principal investigator (during data collection), Consistency and completeness were checked by data collectors (during and after data collection), Moreover every night on a daily basis the consistency and completeness of the data were checked by principal investigator.

Data analysis:- Qualitative data were analyzed manually using thematic and content analysis with respective dimensions and results were presented in narrative form. Cleaned quantitative data from Epi-data was exported to SPSS version 20 for further analysis so that the results were mainly presented by using frequency tables and graphs. Univariate analysis was done to see the frequency, percent and mean of variables for descriptive results. Binary logistic regression was used to determine the association between a dependent variable and independent variables. Moreover, those variables which showed statistical significant value ( $p < 0.25$ ) on bi variate analysis were taken into multivariate analysis.

Satisfaction of mothers on the service they get were rated by 13 items each having a five-point Likert scale from strongly disagree [1] to strongly agree [5] which has internal reliability (Cronbach's  $\alpha$  of 0.800). This shows that the items were internally consistent. To see the total score of each respondent, the points obtained from the 13 items by each respondent were computed. A respondent had a minimum 5 and a maximum of 65 points on ICCM service satisfaction score. Clients were categorized as not satisfied (if they score below the mean) or satisfied (if they score  $\geq$  to the mean satisfaction score). In all cases, the statistical analysis result was considered to be statistically significant at P value  $< 0.05$ . The final interpretation of results was based on evaluation weights and the statistical analysis result of the evaluation.

### 3. Result

Resources availability was evaluated at 57 health posts of Hadiya zone, and their respective standard was set according to the number of under-five population of the respective health posts (estimated episodes/child/year: 0.27 (pneumonia), 0.10 (malaria), and 3.0 (diarrhea)) were

assumed to have and the amount of resources availability was defined for three months stock for every item.

Human resource;- All 57 health posts had two female health extension workers (a total 114 HEWs). Among these health extension workers, only 15 of them upgraded their education to diploma level, and 33 of them were selected for upgrading in this year, and the rest of them were at certificate ( $10^{+1}$ ) level. Nearly all HEWs (112/114 [98%]) were trained for 6-days on ICCM to manage a cough, diarrhea, fever (malaria), and malnutrition. However, health extension workers at two health posts claimed that either in-service or refreshment training was not given for them, because they were in the Harar region in which the ICCM program was not implemented. Other health extension workers stated, although ICCM training was addressed before the implementation ICCM program, they faced challenges in managing under two month age sick children and community based newborn care (CBNC) training was not being given to all health extension workers they encountering the problem of managing sick under two months of age children.

Drugs and Medical supplies:- Fifty seven (100%) HPs were observed to have essential drugs and medical supplies for the sick children on the day of evaluation. Out of 57 HPs, ORS and RUTF were available at 52 (91.2%) of HPs; vitamin A capsules and zinc tablets were available at 49 (86%) of HPs; Cotrimoxazole and paracetamol were available at 38 (67%) HPs; Mebendazole, Artesunate and Coartem were available at 40 (70%), 24 (49%), and 20 (35%) of HPs respectively. Amoxicillin, chloroquine syrup and folic acid were available at only 8 (14%), 7 (12.3%), and 6 (10.5%) of HPs respectively.

One of Dilibera Mago health post staff said,

*"...after we received training on ICCM, we conducted community mobilization about ICCM services, and we informed that the services were provided without any cost or fee, all ICCM drugs were for free and always available in our health post at working hours, however, from the beginning of the implementation of the program until to now, supplementation of ICCM drugs were our challenges and the main reason for client complaints."*

Masbira health post staff who is 28 years old said,

*"...some drugs like chloroquine syrup, amoxicillin both tablets and syrup and folic acid were never resupplied after first time stock out for the last one year; due to this we encountered problem of managing sick under-five children with malaria classification when their RDT test showed Plasmodium vivax specious and sick children with classification of severe uncomplicated malnutrition were not respond as expected by the program due to lack of the above drugs."*

Similarly, staff of Bukuna health post said,

*"...ICCM services had been interrupted for consecutive four months before three month due to stock out of all ICCM drugs as the result client fellow was decreased and they complain us."*

Health extension worker in Morsito health post said,

*"...the reason for unavailability of ICCM drugs was the*

*weak linkage between health posts and health centers, lack of supportive supervision; our weak drugs balance management and weak requesting, resupplying and reporting system.”*

Other Health extension worker from Mento Akebela health post said,

*“...we were frequently requested the catchment health center and woreda health office for ICCM drugs, however, we were not regularly supplied with ICCM drugs on time and enough amount concerning caseload, even if, most of the time they provided ICCM drugs with a near expiry date. So that, most ICCM drugs were expired before use.”*

Head of Misha woreda health office, a clinical nurse with age 35-45 years, said,

*“...the reason for unavailability of ICCM drugs was a problem of the Pharmaceutical Fund and Supply Agency of southern region because they were signed memorandum of understanding to supply essential ICCM drugs every quarter but they could not supply even in 6months gap, due to this our health posts suffer shortage of some essential ICCM drugs like amoxicillin, folic acid, chloroquine syrup and coartem.”*

key informant among zonal disease prevention and health promotion officers said,

*“...shortage of essential ICCM drugs had been our headache in previous years. However, there was good progress in supplementation of essential ICCM drugs by PFSA in this quarter and we already communicated with woreda health offices to allocate budget for purchasing ICCM drugs.”*

Majority of HPs had weighing scale 55 (96.5%), MUAC tape 54 (94.7%), ORT corner 49 (86%) and thermometer 48 (84%). RDTs and Ambu bags were available only in 17 (30%) and 9 (16%) of the HPs respectively.

Guidelines, Recording and Reporting tools:- All of the HPs (57) had chart guidelines, registration books and reporting formats. Out of 57 observed HPs, family health card and OTP card were available in 55 (96.5%) and 44 (77%) of HPs respectively during the evaluation period. Only 5 (8.8%) HPs had safe and clean water.

In program resource availability lowest result is recorded in clean and safe water 5 (8.8%), folic acid 6 (10.5%), chloroquine 7 (12), amoxicillin 8 (14%) and Ambu bag 9 (15.8%); and good result is recorded in guidelines, registrar's, reporting tools 57 (100%); trained HEWs 112 (98%), and MAUC tape 55 (96.5%). Overall on average quality of the program as per availability dimension is determined to be poor (67%).

Health Extension workers compliance with the ICCM guideline:- Compliance of 114 health extension workers with national ICCM guideline was evaluated at 57 health posts by reviewing one year document and direct observation while HEWs were providing ICCM services for 570 sick under-five children at their corresponding health posts.

*Direct observation of health extension workers while delivering ICCM services:-* This evaluation assessed the compliance of health extension workers through observing

570 (100%) sick under-five children while HEWs is delivering ICCM services.

Out of 570 observed ICCM cases 512 (89.9%) care givers were greeted and called by their name, age of sick was asked for 489 (85.8%) caregivers, temperature was measured for 414 (72.6%) sick children and weight was measured for 495 (86.8%), sick children; danger signs were checked for 488 (86%) sick children, counselling was provided 481 (84%) care givers, pneumonia was correctly classified for 260 (83%) of sick children, diarrhea was correctly classified for 148 (64%) of sick children, and malaria was correctly classified for 424 (71%) of sick children, and malnutrition status was correctly classified for 424 (74%) of sick children. In addition to treating sick children HEWs checked sick children for routine services like immunization for 474 (83%), vitamin A 457 (83%), de worming for 197 (81%) of sick children using this opportunity. The other evaluation of direct observation was even though HEWs miss-classified sick children for their illness, did they correctly prescribed for that misclassification sick children keeping with correct dose, duration and schedule; based on this criteria 244 (78%) of sick children were correctly treated for pneumonia classification, 141 (61%) sick children were correctly classified for diarrhea classifications, 172 (76%) sick children were correctly classified for malaria classifications, 62 (62%) sick children were correctly classified for malnutrition classifications and only 41 (60%) with severe classification were referred.

Health extension worker, from Dilibera Mago health post, said,

*“...throughout the year there was no supportive supervision specifically on ICCM services, due to this our skills on ICCM was not improved especially in diarrhea classification and treatment which contain calculations of amount of ORS with plan B.”*

Misrak Fonko health post staff said,

*“...even though two health professionals were assigned to our health post for technical support weekly, but they did not support us on ICCM because they were not trained on ICCM.”*

A male key informant from Geja health center who is health officer said,

*“...ICCM program was interrupted for more six months for a different reason like maternal leave, due illness...; it might be the cause skill gap in classifying, treating and referring sick under-five children.”*

Lissana health center staff who is male, BSc nurse said,

*“...the main reason for misclassification, mistreatment and misreferral by HEWs were the provision of ICCM services without referring ICCM chart booklet or guideline.”*

In compliance of the health workers with national guideline of ICCM program lowest result is recorded in diarrhea management 209 (50%), treatment of malnutrition 89 (62%), supportive supervision and follow-up visit 72 (63%) and performance review meeting 30 (26%); and good result is recorded in sending report timely to next supervisory body 57 (100%), checking general danger signs 1161 (98%)

and immunization status 1108 (94%) of sick child, counselling caregivers about food, fluid and when to return for next visit 1101 (92%). Overall on the average quality of the program as per compliance dimension is determined to be good (76%).

## 4. Acceptability Dimension

### 4.1. Socio-Demographic Characteristics of the Study Participants

Four hundred twenty-three (423) caregivers exit interview were conducted in 57 health posts of Hadiya zone. The response rate of study subjects for interview was 100%. The median age of the caregivers was  $27.35 \pm 5.051$  years (SD) with age range between 17–52 years. Almost more than half of the caregivers 229 (54.1%) had no formal education while 151 (35.7%) had primary education and 43 (10.2%) had secondary and beyond the secondary level. Two hundred eighty-five (67.4%) of the caregivers were Christians followed by Muslims 127 (30%) and Catholic 11 (2.6%). More than half of care giver's 218 (51.5%) had a yearly family income between 4571.50 and 8000 Ethiopian birr followed 106 (25.1%) less than 4571.50 Ethiopian birr and 99 (23.4%) had more than 8000 Ethiopian birr. Three hundred ninety-three (92.9%) of the caregivers were married; whereas 30 (7.1%) were single. Majority of caregivers 301 (72.2%) were Hadiya followed by 101 (23.9%) Gurage and 11 (2.6%) Silte ethnic groups respectively. More than half of the care givers 269 (63%) were housewives (unemployed) and followed government employ 121 (28.6%) and trader 33 (7.8%).

Caretakers behaviour and services delivered:- Two hundred eighty 280 (66.2%) caregivers reported that the illnesses of the child were told for them by health extension workers while the rest 141 (33.3%) were claimed that the illnesses of the child were not explained for them by HEWs. Two-third of caregivers 282 (66.7%) and 280 (66.2%) stated that de-worming after 24 months and vitamin A after six months were provided every six months for their child by HEWs respectively. About 346 (81.8%) caregivers explained that necessary vaccinations for child's age were provided per immunization schedule at health post by HEWs. Three hundred eighty-six 386 (91.2%) caregivers reported that ORS was prescribed when it was necessary for that specific sick child (when sick with diarrhea).

Satisfaction level of caretakers on ICCM services:-The mean score of client satisfaction on the ICCM services received was 48.97 and 185 (43.7%) of caregivers were scored less than the mean satisfaction score (not satisfied). More than two-thirds (73.8%) of caregivers were satisfied on the overall quality of ICCM service, and 77.3% of caregivers were satisfied on the appropriateness of place where the child was managed. An almost equal number of caregivers (71.4%), was satisfied on consultation time, examination room privacy, the chance given to talk and (71.6%), respect given during consultation (71.2%). Less than three-quarter of caregivers 298 (68.3%), and 272 (64.3%) were satisfied on the

availability of drugs and waiting time respectively.

### 4.2. Bivariate Analysis of Variables Associated with ICCM Services

To assess the association of different independent variables with the outcome variable (client satisfaction), bivariate logistic regression analysis was carried out, and in crude association, all variables with a p-value less than 0.25 were become a candidate for multivariate logistic regression. Based on the binary logistic regression analysis, occupational status, educational status, religion, household annual income level and information provided when come-back were predictor variables for client satisfaction on ICCM services.

Multivariate analysis of variables associated with ICCM services:-On multivariate analysis, four variables were found to be associated with the client satisfaction greater than the mean score on ICCM services. Educational status, religion, an annual income of the family and information on when to come back for next visit were associated with care givers satisfaction greater than the mean score on ICCM services.

Caretakers who learned primary level education were found to be two times more likely to score above the mean satisfaction score than those who had no formal education. AOR=2.285 (1.429, 3.655).

Muslims were found to be two times more likely to score above the mean satisfaction score than those who were Christians AOR=1.866 (1.167, 2.983).

Those who had a total annual household income less than 4571 were found to be four times more likely to score above the mean satisfaction score than those who had annual household income of 4571-8000. AOR=4.427 (2.369, 8.273) and those who had a total annual household income greater than 8000 were found to be two more likely to score above the mean satisfaction score than those who had an annual household income of 4571-8000. AOR=1.842 (1.104, 3.073).

Those caretakers who didn't receive information on when to come back for revisit were found to be 64.6% less likely to score above the mean satisfaction score than those received information on revisit. AOR= 0.354 (0.174, 0.0.718).

In acceptability of ICCM program by caregivers lowest result is recorded in perceived that ICCM drugs are available always at health posts 69%, perceived that the waiting time is reasonable, and service is easily accessible in terms of distance from their home 64%,; and good result recorded in perceived that the waiting area is appropriate to wait for service (77%), perceive that the health extension worker is competent enough to provide service and explain their problem and treatments very well (73%).

### 4.3. Judgment Matrix for the Overall Quality of ICCM Program

The overall quality of ICCM program was recorded as good result 71.85%; overall compliance dimension was also recorded as good result 34.2 (76%), but the overall availability dimension was recorded as poor result 23.45 (67%).

Discussion:-The overall judgment of availability of ICCM program resources was poor, but all health posts had ICCM guideline, registration book and monthly reporting format. From a total of 57 health posts, only 15.8% had newborn resuscitation Ambu- bag. This was also supplemented by the qualitative component of the study as PFSA was not kept the agreement signed with regional health bureau to supply health posts with Ambu- bag according to the agreement; even nine of them were supplied by UNICEF for delivery services.

Availability of essential drugs is fundamental to good quality health care and patient satisfaction (i.e., “no product, no program”) [31]. In this study, the availability of all essential drugs and supplies for the sick child was only in 6 (10.5%) of the HPs. Artesunate suppository was available at 49% health posts, coartem was available at 35% health posts, Amoxicillin was available only at 14% health posts, folic acid was available at 10.5% health posts, and RDT test kit was available at 29.8% health posts. This finding indicates little improvement when compared with study done on baseline assessment for the availability of ICCM program resource in 2014, which indicate coartem availability in 10% surveyed health posts and RDT availability in 22% of surveyed health posts [32].

RUTF (plumpynet), ORS, Zink, Cotrimoxazole and Chloroquine were available at 91.2%, 91%, 87.5%, 66.7%, and 12% of health posts respectively. These findings are lower than the study conducted to assess the quality of care and adherence to medication for ICCM program in Beneshangul-Gumuz region for Cotrimoxazole, ORS and chloroquine (96.3%, 94% and 54%) respectively; but similar for Zink 87.6% [33].

Similarly, the finding is also lower than the study conducted to assess the implementation strength and quality care of ICCM program in Ethiopia, for Cotrimoxazole which is available at 99% of health posts, but similar for RUTF (plumpy net) which is available at 91% of health posts [7]. The reason for this difference as evidenced from qualitative data showed that there were an irregular supply of essential ICCM drugs in the zonal health department, woreda health offices and health centers.

Infrastructure is important to deliver service, but this study finding indicates only (8.8%) had clean water supply. This finding is lower than a study done in Jimma and West Hararge zone, Oromia Region which indicates 16% of health posts had clean and safe water [13].

Overall compliance of health extension workers with national ICCM guideline was good. Document review finding indicates that health extension workers checked danger sign for 98% of sick under-five children, but during direct observation, 86% of sick under-five children were checked for danger sign. The result in document review was better than a study done in Beneshangul-Gumuz region in 2014 which indicates 85.8% of sick children checked for danger signs [34].

Document review result indicates 94% of sick children were checked for immunization status. This finding was

consistent with a study done in Beneshangul-Gumuz region in which 95% of sick children checked for immunization. It also indicates 92% of caregivers were counseled about food, fluid and when to return back. This finding is better than a study done in Beneshangul-Gumuz region in 2014 which indicates 74%givers are counseled about food, fluid and when to return back [34].

Correct classification of pneumonia, diarrhea and malaria conducted for 76%, 74% and 84% of sick children respectively. These results are lower than a study done to assess the quality and use of ICCM program in three regions of Ethiopia which indicate correct classification of pneumonia, diarrhea and malaria are 88%, 92% and 93% respectively [35]. The reason for this variation may be poor utilization of chart booklet and low supportive supervision as stated in qualitative result by key informants.

Among sick children correctly classified for diarrhea, pneumonia, malaria and malnutrition 50%, 75%, 84% and 59% were correctly treated according to national ICCM guideline. These results are lower than study done to assess quality and use of ICCM program in three regions of Ethiopia which indicates correctly treated for diarrhea malaria and pneumonia are 80%, 91% and 86% respectively [35].

In addition, the proportions of children correctly managed for diarrhea (50%) were lower than study done to assess the implementation strength and quality care of ICCM program in Ethiopia which indicate 79% of sick children are correctly managed according to national guideline [7]. This difference may be due to absence performance review meeting and clinical mentoring meeting.

The finding of our study was better than study conducted in developing countries, which indicate only 39% of children receive correct treatment for diarrhea and 30% of children with suspected pneumonia receive an antibiotic [19].

In this evaluation, acceptability of ICCM services by caregivers was measured by satisfaction. Overall satisfaction of clients on the quality of services provided to them was 70.8%. This finding is lower than the study conducted to assess client satisfaction with ICCM in Wakiso district, Uganda in which 80% of caregivers of children satisfied with ICCM (36). This difference might be due to subjective nature of overall satisfaction which could be explained by different kinds of literature used different dimensions of satisfaction, there were no uniform judgment in each of these literature and social desirability couldn't also be excluded for this difference.

Our evaluation showed that caregivers who learned primary level education were found to be two times more likely to score above the mean satisfaction score than those who had no formal education. AOR=2.285, 95% CI (1.429, 3.655), P-value = 0.001). This finding was consistent with finding in Wakiso District, Uganda which indicates primary education (AOR= 2.8, 95% CI 1.12 - 6.80) has statistical significance with caregivers satisfaction [36].

Further in our study showed that Muslims were found to be two times more likely to score above the mean satisfaction score than those who were Christians AOR=1.866, 95% CI

(1.167, 2.983), P-value = 0.009). This finding was also consistent with finding in Wakiso District, Uganda which indicates being a Muslim (AOR= 2.9, 95% CI 1.40 - 6.34) were significantly associated with client satisfaction [36].

Similarly, those who had total annual household income less than 4571 were found to be four times more likely to score above the mean satisfaction score than those who had annual household income of 4571-8000. AOR=4.427 (2.369, 8.273), p-value=0.001) and those who had total annual household income greater than 8000 were found to be two more likely to score above the mean satisfaction score than those who had annual household income of 4571-8000. AOR=1.842, 95% CI (1.104, 3.073), p-value=0.019). This finding was also consistent with a study conducted to assess Client satisfaction with integrated community case management program in Ethiopia indicates income level besides its intrinsic health nature has an association with client satisfaction [36]. This might be when the participant's income level increases, different health needs might be increased and the health system didn't meet their needs.

Our evaluation also showed that caretakers who didn't receive information on when to come back for revisit were found to be 64.6% less likely to score above the mean satisfaction score than those received information on a revisit. AOR=0.354, 95% CI (0.174, 0.718), p-value=0.004). This finding was inconsistent with finding in Wakiso District, Uganda which indicates being trader has no statistical significance with caregivers satisfaction [36].

Information bias from caregivers based on their subjective judgments might affect the true picture of the quality of ICCM services, and since the observation was direct, health extension workers often might not have behaved in ways that are typical of their day-to-day behaviour, were some of the limitations of the evaluation.

## 5. Conclusions

Quality of integrated community case management of common childhood illness was judged to be good with poor availability of necessary resources especially essential ICCM medicines except for ORS and plumpy nut; good compliance of health extension workers with national ICCM guideline besides poor management of sick children with diarrhea classifications and malnutrition. Supportive supervision was conducted for only once for 34 health posts through the year, and 23 health posts never received supportive supervision. Only one woreda was conducted performance review meeting once per year. These were the main cases for the poor performance of diarrhea malnutrition management in Hadiya zone.

The mean score of client satisfaction on the quality of ICCM services received was 48.97. Caregivers scored above the mean satisfaction score (satisfied) on quality of ICCM services were 238 (56.3%) and scored less than the mean satisfaction score (not satisfied) on quality of ICCM services were 185 (43.7%).

Overall satisfaction of caregivers on the quality of ICCM

services provided was good according to the judgment criteria. Caregivers who learned primary level education, a family annual income of less 4571 and greater than 8000, and Muslim religion and received information about when to return for next revisit were found to be more likely to satisfy on the quality of ICCM services provided than their counterparts.

## 6. Recommendations

Hadiya zone health department in collaboration with woreda health office, regional health bureau and other non-governmental organizations should assess the utilization of sick under two months of age and community based newborn care training should be given for all health extension workers. The zone health department, woreda health offices, health centers and development partners have to strengthen regular supportive supervision, clinical mentoring and performance review meeting according to standards for each level.

The woreda health offices and health centers have to allocate enough budget for purchasing essential ICCM drugs and supplies without waiting PFSA.

In addition to continuous supportive supervision, all health centers and health extension workers has to be addressed by on job training through the facilitation of woreda health office, Zonal health department, regional health bureau and development partners. Health posts have to strengthen supply chain management, integrated pharmaceutical logistics system (IPLS) and community mobilization.

## Abbreviations

AOR: Adjusted odds ratio

CCM: Community case management

CCBN: Community-based newborn care

HEW: Health extension workers

HPs: Health posts

ICCM: Integrated community case management

IEC/BCC: information education communication /behavioural change communication

MDG: Millennium development goal

MUAC: Mid-upper arm circumference

OTP: Outpatient therapeutic program

RDT: Rapid diagnostic test

RUTF: Ready to Use Therapeutic Food

## Declaration

### *Ethics Approval and Consent*

Ethical clearance was secured from Jimma University College of public health and medical sciences, ethical committee before the beginning of data collection activity. Written consent was obtained from Hadiya zone health department, woreda health office, from the concerning health centers, HEWs and clients after explaining the purpose of the study to them. Confidentiality of the information given was

maintained throughout the process of data collection. The evaluation team was trained on how to handle sensitive and emotional issues and on the importance of keeping confidentiality and conflict of interest was identified and dealt with openly and honestly, so that it did not compromise the evaluation processes and results. Evaluations were designed to assist organizations, to address and effectively serve the needs of the full range of targeted participants. Exit interview and observation of the participants were conducted after receiving written consent from participants and health.

### **Consent to Publish**

All four authors are interested and agreed to publish this article.

### **Competing Interests**

There is no competing interest with the presented data as external data collectors collected it. There was no financial interest between the funder and the research area community and us. We have no any form of competing for financial and non-financial interest between ourselves.

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### **Authors' Contributions**

The four authors have made a significant contribution in the proposal development data collection and data analysis and manuscript preparation process of this work.

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