

Robinah Najjemba, Lilian Kiapi, Shiferaw Dechasa Demissie, Tadesse Gossaye, Mezgebu Engida, Ruwan Ratnayake, Tedbabe Degeffie, Hailemariam Legesse, Ataklti Fisseha Lemma, Hiwot Getachew, Muluken Gebrie. *Ethiop Med J, 2014, Vol. 52, Supp 3*

ORIGINAL ARTICLE

INTEGRATED COMMUNITY CASE MANAGEMENT: QUALITY OF CARE AND ADHERENCE TO MEDICATION IN BENESHANGUL-GUMUZ REGION, ETHIOPIA

Robinah Najjemba, MD, MPH¹; Lilian Kiapi, MD, MPH²; Shiferaw Dechasa Demissie, MPH³; Tadesse Gossaye, MPH, MBA⁴; Mezgebu Engida, CRN⁵; Ruwan Ratnayake, MHS⁷; Tedbabe Degeffie, MD, MPH⁷; Hailemariam Legesse, MD⁸; Ataklti Fisseha Lemma, MPH⁹; Hiwot Getachew, MPH¹⁰; Muluken Gebrie, BSc¹¹

ABSTRACT

Background: The International Rescue Committee (IRC) supports implementation of integrated Community Case Management (iCCM) in all 20 woredas (districts) of Benishangul Gumuz Region (BSG) in Ethiopia.

Objectives: To identify the gaps in the provision of quality iCCM services provided by Health Extension Workers (HEWs) and to assess caregivers' adherence to prescribed medicines for children under five years of age.

Methods: We conducted a cross-sectional descriptive study with both quantitative and qualitative study methods. We interviewed 233 HEWs and 384 caregivers, reviewed HEW records of 1,082 cases, and organized eight focus groups.

Results: Most cases (98%) seen by HEWs were children 2-59 months old, and 85% of the HEWs did not see any sick young infant. The HEWs' knowledge on assessments and classification and need for referral of cases was above 80%. However, some reported challenges, especially in carrying out assessment correctly and not checking for danger signs. Over 90% of caretakers reported compliance with HEWs' prescription.

Conclusion: Partners have successfully deployed trained HEWs who can deliver iCCM according to protocol; however, additional support is needed to assure a supply of medicines and to mobilize demand for services, especially for young infants.

Key words: Ethiopia, child health, Health Extension worker, community case management, Malaria, Pneumonia, Caretakers adherence, Child treatment, Child Survival, Health Extension Program.

INTRODUCTION

One in every 17 Ethiopian children dies before his or her first birthday, and one in every 11 children dies before his or her fifth birthday (1,2). The majority of these deaths are from preventable or treatable conditions: neonatal problems (25%), pneumonia (15%), diarrhea (23%) and malaria (7%) with malnutrition as an underlying cause in 57% (1,2). A key challenge to reduce childhood mortality is providing access to high quality health care in remote areas. The Federal Ministry of Health (FMOH) revised the Health Extension Program (HEP) policy mandating Health extension workers (HEWs) to treat non-severe childhood pneumonia in addition to provide essential newborn care and manage malaria, diarrhea and se-

vere acute malnutrition (3). The International Rescue Committee (IRC) is an implementing agency supporting the government to roll out the Integrated Community Case Management (iCCM) strategy in all 20 woredas (districts) of the Benishangul Gumuz Region. From October 2011 to April 2012, IRC supported the training of 671 HEWs. The purpose of this study is to identify gaps in the quality of iCCM services provided by HEWs in BSG and to assess caregivers' adherence to medicines prescribed for children under five. The information generated by the study will be used by IRC and other partners to develop strategies to address gaps identified.

METHODS AND MATERIALS

We conducted a descriptive cross-sectional study in Assosa, Kamashi, and Metekel Zones and in Maoko-

¹Public health consultant, Geneva, Switzerland, ²Health Coordinator, IRC (former); Senior Technical Officer, Liverpool School of Tropical Medicine, Kenya (current), ³Health Coordinator, IRC, Addis Ababa, Ethiopia, ⁴Health Coordinator, IRC (former), Addis Ababa; STOP Consultant/WHO (current), ⁵iCCM Manager, IRC, Addis Ababa, Ethiopia, ⁶Technical Advisor, Epidemiology, IRC New York, USA, ⁷Health Specialist, UNICEF, Addis Ababa, Ethiopia, ⁸Process Owner, Regional Health Bureau, Benishangul Gumuz Region, Ethiopia, ⁹Health Manager, IRC, Addis Ababa, Ethiopia, ¹⁰Health Manager, IRC, Assosa, Benishangul Gumuz Region, Ethiopia

mo Special *Woreda* of Benishangul-Gumuz Region, from 31 July to 15 August 2012.

HEW Survey: We surveyed 233 HEWs trained in iCCM between October 2011 and March 2012 in all 20 *woredas* with IRC support. We interviewed 384 caregivers of children who were sick in the previous two weeks seen by the HEWs. We used a modified Kish and Leslie formula with a 95% confidence level, a precision estimate of $\pm 5\%$, and a p-value of 5% to calculate the sample size (4). We randomly selected the 233 HEWs from the 571 who were trained with probability proportionate to the number trained in each *woreda*. If the sampled HEW was absent, we replaced the second HEW at the health post (HP) if she was also trained during the same time period; otherwise, we randomly selected an HEW from another HP within the same *woreda*.

Quality of Case Management: We assessed HEWs' case management knowledge two ways. First, we used one case scenario for each age group (0-1 months – i.e., Sick Young Infant [SYI] – and 2-59 months). The SYI case scenario was a 7-week-old child with a weight of 4 kg, axillary temperature of 36.5°C and 3 days' history of bloody diarrhoea but with no danger sign; and the 2-59 months old case scenario was a 30-month-old child with history of cough for two days, trouble breathing and fever for 1 day, and axillary temperature of 38.5°C. The HEWs used their chart booklet and recording forms to assess the case scenarios. We assessed identification, assessment, classification, and treatment through the scenarios. In addition, we interviewed HEWs before the case scenario about their experience and perceived gaps in knowledge and skills.

Register Review: We reviewed the case of previous month's cases by age group and classification. Then, we reviewed the five most recent cases (a total of 1082) to establish completeness and consistency of classification or treatment vs. assessment through register review method.

Inventory: We directly observed the availability of iCCM drugs and supplies using the "Form C" checklist, a nationally developed iCCM program supportive supervision tool that looks at iCCM inputs, especially essential iCCM drugs, supplies, and equipment.

Caregiver Survey: We randomly selected from the registers one case of malaria/fever and one of cough/difficulty breathing seen in the previous two weeks at each HP to assess caregivers' adherence to HEWs' prescriptions. If the selected case was absent during the first attempted visit, we made an appointment for

one revisit before marking the caregiver absent. We administered a structured questionnaire to assess adherence to prescribed medications and explored reasons for non-adherence.

Focus Group Discussions We conducted eight focus group discussions (FGDs) with non-surveyed caregivers of children under five, each group with 8-12 participants. We selected the participants who were accessible and had free time for group discussion during data collection. The question guide explored awareness of the iCCM program, household decision-making for care seeking, and health-seeking behavior for sick children.

Data analysis: Data were single-entered and analyzed using Epi Info, version 3.5 software (5). The data entry program included limits and protected cells to minimize data entry error. We defined HEW knowledge and skills as "good" if they correctly met 80% of the parameters (identification, assessment, classification and treatment) per the national protocol; we defined drug availability as "good" if all specified drugs (100%) were observed (6). Bivariate analysis was conducted to assess association between variables. We considered a p-value ≤ 0.05 statistically significant when assessing a possible association between variables. Data from the FGDs were transcribed and translated into English and triangulated with the quantitative findings.

Ethical considerations: Benishangul-Gumuz Regional Health Bureau provided ethical clearance for the study. Interviewers obtained oral informed consent from all study participants. Participants were informed that they could withdraw from the study at any time. In addition, measures were taken to ensure confidentiality such as holding interviews in a private setting and storing all data under lock and key.

RESULTS

We assessed 217 (93%) of the intended sample of 233 HEWs. **Case Scenarios:** Most HEWs correctly recorded the parameters to identify young infants (>98%) (Table 1). Performance in assessment and classification was also good (>82% and >80%, respectively); however, performance was lower for treatment and follow-up. For example, only 12.6% mentioned following-up at a later date. A similar pattern was observed for older children. Many HEWs had lower performance in identifying danger signs and associated disease, such as malnutrition and HIV status for both the mother and baby (Table 2).

Table 1: HEW Knowledge of assessment, classification and treatment of a case scenario of a sick young infant

Variables	Frequency (n=217)	Percentage	95% Confidence interval
Identify			
Child's name	217	100	
Child's <i>kebele</i>	215	99.1	96.7-99.9
Child's sex	216	99.5	97.5- 100
Child's age	216	99.5	97.5-100
Child's weight	217	100	
Child's temperature	214	98.6	96.0-99.7
Assess			
Diarrhoea as the child's problem	210	96.8	93.5-98.7
Number of days for the diarrhea	214	98.6	96.0-99.7
Presence of blood in the stool	204	94.0	90.0-96.8
Skin pinch as assessment of dehydration	178	82.0	76.3-86.9
Number of breaths per minute	209	96.3	92.9-98.4
Child's immunization status not yet started	208	95.9	92.3-98.1
Classify			
Dysentery	179/216	82.9	77.2-87.6
Mother's HIV status unlikely	175/217	80.6	74.8-85.7
Treat (n=215)*			
Refers the case	194	90.2	85.5-93.9
Gives ORS	146	67.9	61.2-74.1
Mother advised on breast feeding	160	74.4	68.0-80.1
Gave follow-up date	27	12.6	8.4-17.7

*Two HEWs did not record management and so were excluded from the analysis

Table 2: HEW knowledge of assessment, classification and treatment of a case scenario of a sick child.

Variables	Frequency (n=217)	Percentage	95% Confidence interval
Identify			
Child's name	215	100	
<i>Kebele</i>	215	100	
Child's sex	214	99.5	97.4-100
Child's age	214	99.5	97.4-100
Child's weight	215	100	
Child's temperature (38.5°C)	211	98.6	96.0-99.7
Assess			
Unable to feed as danger sign	172	80.8	74.8-85.8
Lethargy as danger sign	143	66.5	59.8-72.8
Cough as child's problem	207	96.3	92.8-98.4
Cough duration (days)	198	92.5	88.1-95.7
Fever as a problem	210	98.1	95.3-99.5
The number of days for fever	192	89.3	84.4-93.1
Difficult breathing as child's problem	203	94.4	90.5-97.1
Harsh noise/stridor	180	83.7	78.1-88.4
Chest in-drawing	184	86.0	80.6-90.3
The number of breaths (60) of the child	211	98.1	95.3-99.5
Fast breathing	175	81.4	75.5-86.4
Child had received vitamin A	208	96.7	93.4-98.7
Classify			
Severe pneumonia/very severe febrile disease	195	89.9	85.1-93.5
No acute malnutrition	157	72.4	65.9-78.2
Mother HIV status positive	154	71.0	64.4-76.9
Childs has HIV or possible HIV infection	156	71.9	65.4-77.8
Treat (n=216)*			
Refer case	200	92.6	88.2-95.7
Give paracetamol as pre-referral treatment	51	23.6	18.1-29.8
Give cotrimoxazole as pre-referral treatment	167	77.3	71.1-82.7
Give follow-up date	23	10.6	6.9-15.5

Case Management Knowledge: About 91% of HEWs knew the age-specific, respiratory rate cut-offs. About (64%) knew the lower temperature cut-off danger sign for a hypothermic SYI. No statistically significant (data not shown) difference was observed among HEWs trained with six months vs. more than six months prior to study.

Register Review On average, HPs treated 13 cases in the previous month with a wide range for both sick children (1-95) and sick young infants (0-13). The vast majority of cases (98%) were 2-59 month olds. About 85% of HEWs did not attend to any SYI in the previous month (Table 3).

Table 3: Presenting complaints of the cases seen by the HEWs in the month prior to the study

Variable (Symptoms)	Total	Percentage
2 months – 5 years (N=3501)		
Fever	1590	45.4
Diarrhea	1237	35.3
Difficult/Fast breathing	659	18.8
Malnutrition	15	0.4
0-2 months (N=32)		
Diarrhea	17	53.1
Difficult breathing	8	25.0
Bacterial infection	4	12.5
Severe malnutrition	3	9.4

*HEWs merged related complaints and wrote classification terms instead of presenting complaints. Thus, “difficult/fast breathing” refers to cough, grunting, and difficult breathing; “bacterial infection” refers to skin infection and red or draining pus from the cord; “malnutrition” refers to perceived underweight or poor growth; and “severe malnutrition” refers to visible wasting, bilateral swelling of both legs, or complaint of malnutrition. Even with this merging, multiple symptoms are possible.

Almost all cases reviewed in the registers about 96% had all the required background information and case classification, and nearly all of the classifications (92%) were consistent with assessment and according to national guidelines (7). The correct recommended frequency and duration of treatment with Coartem, cotrimoxazole, zinc and chloroquine were generally high (94%, 93%, 95% and 68%, respectively). However, the correct recommended dosage for age was slightly lower, for each of the above (78%, 77%, 95% and 53% respectively).

Drug Availability: Over 80% of the HPs were observed to have essential drugs (Coartem, cotrimoxazole, ORS and zinc) for the sick children on the day of assessment. About 13% of HPS did not have plumpy Nut Sachets. All of the HPs had chart booklets and registration books. RDTs and timers were available in 85% of the HPs. Disposable gloves and Ambu bags were not available in most HPs (Table 5).

Caregivers’ Adherence: The response rate for caregivers was 99%. The mean age for the caregivers was 30.9 years (range: 14-85); most (81.1%) were biological mothers. Most caregivers (93-100%) reported that they followed the HEW’s instructions regarding dose and frequency for Coartem, cotrimoxazole and zinc; however, fewer admitted to adhering to the full duration (67-89%) (Table4).

The recommended treatment duration was associated with the caregivers’ likelihood of completing the prescribed medicine. Children prescribed 10 days of zinc were five times less likely to complete the course than those receiving three days of Coartem, while those receiving five days of cotrimoxazole were 1.5 times less likely to complete their course than counterparts receiving three days of Coartem. Children who received one drug were three times more likely to complete treatment than those who received either two or three drugs. Other stated reasons for non-adherence were that the child improved, or that caregivers wanted to save the drugs for future use, had difficulty administering the medicine, or preferred an injection.

Table 4: Caregivers' reported compliance with HEW instructions regarding drug administration*

Medicine	Amount to be taken each time [n, (%)]	No. of times per day [n, (%)]	Total days to give the medicine [n, (%)]
Coartem (N= 242)	232 (95.9)	233 (96.3)	215 (88.8)
Cotrimoxazole (N= 151)	142 (94.0)	148 (98)	126 (83.4)
Zinc (N= 57)	57 (100)	50 (93)	38 (66.7)

* Coartem: 2 times a day for three days; Cotrimoxazole: 2 times a day for five days; zinc: once daily for 10 days

HEW Work Experience and Perceived Gaps Most HEWs felt motivated to do their work. Only 14% indicated that the iCCM activities were affecting their other HEW responsibilities. They also indicated that the community regarded them as “doctors” because they could treat their children.

Major challenges mentioned were non-adherence to prescribed medicine (16%), no means of transport for referred cases (65%), lack of support of caregivers' husbands (22%), limited supportive supervision (24.4%) and shortage of skill of assessing SYI (18%).

Table 5: Availability of supplies and equipment and drugs

Item	% of HPs (N=217)
Registration for sick young infant	100
Registration for sick child	100
Chart booklets	100
MUAC	97.7
Health education materials	91.7
RDTs	86.6
Timing device	84.8
Weighing scale for children	55.8
Referral forms	45.6
Drug	
Cotrimoxazole pediatric tablets	96.3
ORS sachets	94.0
Coartem (Blue) blister packs	90.8
Zinc tablets	87.6
Chloroquine tablets	54.8
Coartem (Yellow) blister packs	21.7
Plumpy'Nut sachets	12.9
Chloroquine syrup	1.4

DISCUSSION

HEWs are primarily treating children 2-59 m of age and 85% of the HEWs had not seen a SYI. Recording lethargy as a general danger sign was low (67%), but knowledge of assessment, classification and indications for referral was good. Case classification for the primary presenting complaint of the child was over 80% for both case scenarios, but classification for associated conditions (such as HIV status) for both the mother and the child was lower (70%). The relatively low level of knowledge in classifying a hypothermic SYI (64%) as severe disease may be due to limited experience due to a low SYI case load.

Over 90% of prescriptions were correct for the recommended frequency and duration according to the register review. The good prescribing is comparable to a study in Zambia (8). On the other hand, their recommended dosage for age was not as good, except for zinc. This finding calls for continuous supportive supervision to curb this practice that can result in under-dosing, treatment failure, and drug resistance.

Availability of essential drugs is fundamental to good quality health care and patient satisfaction (i.e., “no product, no program”) (9,10). In this study, the availability of drugs for the sick child was over 80% of the HPs, but drugs for the SYI were only available in about 5% of the HPs.

Caregivers’ high reported compliance with treatment instructions could reflect trust in the HEWs’ counseling and the prepackaging of medicines. Studies have established higher adherence with pre-packaged compared to loosely packaged medicines (11). The caregivers’ reported lower compliance for completing the duration of treatment can be explained by their tendency to stop if they noted improvement in the child’s condition as found in similar studies (12). Another reason for non-adherence established by the study was multiple prescriptions. Several studies have shown that there is an inverse association between low compliance and the number of medications given (13,14).

One limitation of this study is that direct observations of HEWs managing sick children could not be undertaken due to limited resources; thus, we used register review as an alternative. Caregivers were

asked to recall adherence after two weeks, and we relied on report rather than observation to assess adherence. Limited information was available on SYI, so few conclusions could be drawn. We cannot explain any of the differences in performance noted by case scenario vs. by record review of a month's experience, but differences are not surprising given the different methods.

Conclusion: The quality of service provided by the HEWs and the caregivers’ compliance to prescribed medicines were good, but some areas need improvement, specifically treatment follow-up, provision of recommended dosage for age, identifying danger signs and associated diseases, and lower temperature cut-off points for SYI. Most caregivers adhered to HEWs’ instructions regarding dose and frequency; however, fewer adhered to full treatment duration depending on the treatment duration requirements of certain drugs or on the number of drugs prescribed. Partners have successfully deployed trained HEWs who can deliver iCCM according to protocol; however, additional support is needed to assure a supply of medicines and to mobilize demand for services, especially for young infants.

Recommendations: Clinical mentoring of HEWs by their supervisors should be strengthened to improve their assessment skills, including treatment follow-up, provision of recommended dosage for age, danger signs, and cut-off points in an integrated, comprehensive manner. HEWs need to improve counseling of caregivers to improve adherence to the full duration of treatment, perhaps through follow-up visits. FMOH and other concerned bodies must ensure an uninterrupted medicine supply.

Acknowledgements: The authors acknowledge the study participants and data collectors for their participation.

REFERENCES

1. Child Health Epidemiology Reference Group (CHERG). Main causes of under-five mortality in Ethiopia, 2008.
2. United Nations Children's Fund (UNICEF). Child Survival: The state of the World's Children 2008. December 2007, New York, NY 10017, USA.
3. Federal Ministry of Health of Ethiopia. National implementation plan for community Based management, 2010, Addis Ababa .
4. Naing L, Winn T, Rusl BN. Practical Issues in calculating the sample size for prevalence studies. *Archives of Orofacial Sciences* 2006;1:9-14.
5. World Health Organization (WHO). Epi info Software. 2012 [cited 2012 Feb 17]. Available from <http://www.who.int/chp/steps/resources/EpiInfo/en/>
6. CORE Group, Save the Children, Basic Support for Institutionalizing Child Survival (BASICS) and Maternal and Child Health Integrated Program (MCHIP) . Community Case Management, Essentials. Treating Common Childhood illnesses in the Community. A Guide for Program Managers, Washington, D.C., 2010.
7. Federal Ministry of Health of Ethiopia. Ethiopia Integrated Management of Newborn and Childhood illness: Facilitators guide for Health extension workers, October, 2010.
8. Hamer DH, Brooks ET, Semrau K, et al. Quality and safety of integrated community case management of malaria using rapid diagnostic tests and pneumonia by community health workers. *Pathogens and Global Health* 2012;106:32-9.
9. Jitta J, Whyte SR, Nasakira N. The availability of drugs: what does it mean in Ugandan primary care? *Health Policy* 2003;65:167-79.
10. Hart C. No Product? No program! *Public Health Reports* 2004;119: 23-4.
11. Ansah EK, Gyapong JO, Agypong IA, Evans DB. Improving adherence to malaria treatment for children : the use of pre-packed chloroquine tablets vs. chloroquine syrup. *Tropical Medicine & International Health* 2001;6:496-504.
12. Kolaczinski JH, Ojok N, Opwonya J, Meek S, Collins A. Adherence of community caretakers of children to pre-packaged antimalarial medicines (HOMAPAK) among internationally displaced people in Gulu district , Uganda. *Malaria J* 2006;5-40.
13. Colombrini MR, Coleta MF, Lopes MH. Risk factors for non-compliance to treatment with highly effective antiretroviral therapy, *Rev Esc Enferm USP* 2008;42:487-92.
14. Sax PE, Meyers JL, Mugavero M, Davis KL. Adherence to Antiretroviral Treatment and Correlation with Risk of Hospitalization among Commercially Insured HIV Patients in the United States. *PLoS ONE* 2012;7:e31591.