

Magnitude and predictors of pre-referral treatment by Community Health Workers practicing in Rural South Western Uganda: A cross sectional study

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Abstract

Background

Pre-referral treatment is critical for management of childhood illnesses. Under iCCM strategy, community health workers (CHWs) give pre-referral treatment to children under five years of age with danger signs. The study examined the magnitude and predictors of pre-referral treatment in a rural setting.

Methods

A retrospective study premised on secondary data reviewed was conducted in 2022. The data reviewed was based on CHWs records March 2014 to December 2018. A total of 1,086 child records that were referred by the CHWs were included in the analysis.

Results

The mean age of children reviewed was 24.5 months (SD \pm 17). Of these, one hundred twenty five (12%) received pre-referral treatment. Children presenting with RDT positive results (aOR = 2.9, 95%CI: 1.6-5.0), diarrhea (aOR = 3.8, 95%CI: 2.0-7.1), fast breathing (aOR = 2.3, 95%CI: 1.3-4.0) and danger signs (aOR = 5.6, 95%CI: 3.1–10.1) were more likely to receive pre-referral treatment.

Conclusion

The proportion of children that received pre-referral treatment among those who were referred was low. Receipt of pre-referral treatment was associated with having a sign danger sign, a positive RDT result, diarrhea and pneumonia.

Background

Out of 10 deaths, 6–8 of them occur in the community before a health facility is accessed(1). Malaria, diarrhea and pneumonia have remained prevalent among children under five years of age and are a leading cause of morbidity and mortality globally.

In Sub-Saharan Africa also contributing to referrals and therefore provision of pre-referred treatment by community health workers (CHWs) (2–4). Sustainable Development Goal 3 target 3.2 emphasized ending all preventable death of children under five by the year 2030(5).

One of the major health challenges has been accessibility of health services. The CHWs have bridged the gap such that over the years with the implementation of integrated community case management (iCCM), accessibility is improving globally (6–9). Several factors contribute to the positive performance

of CHWs among which training and supervision stand out universally (10, 11). In sub Saharan African, support supervision staff observe pre-referral records among others particularly motivating the CHWs to be more acceptable by the communities they serve (12).

Through the iCCM approach, there has been a reduction of global cases of childhood malaria, diarrhea and pneumonia significantly and the referral component and completion rates in rural areas settings has also been felt with increasing reliance in the CHW system in many countries (13–15).

Under Uganda's Ministry of Health iCCM implementation guidelines 2010, the trained CHWs have played a very big role as front liners in managing community cases for many years which has ensured timely treatment of diseases, referral of severe cases and therefore pre-referral care(13). The iCCM strategy has broadly stretched to the hard to reach and underserved rural populations seeking care worldwide (16).

Prior to referral of children under five years of age by CHWs, pre-referral treatment is recommended by World Health Organization (WHO) iCCM guidelines which have been adapted globally identifying five common danger signs namely; convulsions, not being able to drink or breast feed, vomiting, chest in drawing and being very sleepy/ unconsciousness (17, 18).

The additional reasons for referral under iCCM guidelines are cough for 21 days or more, diarrhea for 14 days or more, fever for seven days or more, among the new born children, skin pustules and infected umbilical cord.

A CHW has to provide first dose for some cases and issue a referral form to refer the caregiver to a higher health facility to be managed by professional health workers (19). Some of the cases referred by CHW without providing pre-referral treatment are a negative RDT result, cases CHWs are not mandated to manage under iCCM guideline, children above 5 years of age among others(13).

In a joint statement between WHO/United Nations Children's Fund on iCCM, they recommends that danger signs are recorded after assessing for malaria, diarrhea and pneumonia while evaluating a sick child. It is at this stage that danger signs are sorted for pre-referral and immediate referral to the nearest health facility (18).

A study in Uganda identified fever with a malaria RDT negative result, drug stock out and danger signs as the common reasons for referral (20). Particularly, the caregiver with a child presenting with danger signs qualifies for pre-referral treatment by a CHW who is trained, supervised and provided with uninterrupted medical supplies.

Pre-referral treatment can be misleading during occasions where caregivers perceived the treatment as final medication to children under-five. In other circumstances, ease of going somewhere else for medical support, lack of time by caregiver, health worker absenteeism and disease severity hindered referrals as were the case in rural Uganda and neighboring countries (21, 22).

In rural Tanzania, a study conducted indicated that much as the CHWs were trained to offer pre-referral medication for severe cases or cases with danger signs, the pre-referral approach was heavily affected by community perceptions (23). Sufficient emphasis on clarification that pre-referral is not complete treatment can strengthen the intention of pre-referral treatment even for less severe cases (24).

Pre-referral treatment is an important part of providing care for childhood illnesses in the community. This study examined the magnitude and predictors of pre-referral treatment in a rural setting. The study findings will contribute to the existing body of knowledge on CHW led iCCM.

Methods

Study setting

Bugoye Sub-county is located in the Kasese District of Western Uganda. The Sub-county has a population of approximately 46,124 residents and 7,650 households distributed within 35 villages as of December 2019. The population of children below five years of age is 9,225 (20%). More than half of the Sub-county is mountainous and considerably hard to reach with a majority of low income subsistence residents.

CHWs are volunteers selected by their communities, trained for one week in iCCM based on Uganda Ministry of Health guidelines. After the trainings, the CHWs are equipped with tools such as Sick child job aid, clinical and non-clinical supplies, iCCM CHW registers which they use to document and submit monthly data to BCHC (25).

These iCCM CHWs registers for the period of four years and eight months were reviewed by the study team in mid-2022 to identify children under five years of age who had been referred and offered pre-referral treatment.

Study design

Study data was reviewed retrospectively by the program team for the study period starting March 2014 to December 2018.

Data collection

A total of 1,086 were evaluated as having been referred by CHWs. Pre-referral treatment in the Uganda Ministry of Health's iCCM guidelines 2010 is prescribed to children who present with danger signs. First dose of rectal artesunate is administered to children with fever and convulsions, oral artemisinin-based combination therapy (ACT) for children with severe fever, oral rehydrating solution for children with diarrhea and first dose of amoxicillin for children presenting with chest in drawing .

A CHW assesses caregiver with a "sick child job aid" which helps to evaluate the state of the child as far as malaria, diarrhea and fast breathing. A child who presents with danger signs of convulsions, vomiting, not breast feeding, chest in drawing and unconsciousness qualify for pre-referral treatment.

Data from the monthly iCCM reporting forms was aggregated and entered into epi data software and extracted through excel for the period of March 2014 to December 2018. This data was cleaned, validated for inconsistencies and completeness. The CHWs record basic demographic information, diagnostic and observation results using the register (26).

Data analysis

Data was exported from excel to STATA 12 for analysis. Descriptive statistics, including frequencies and percentages were used to present the proportion of pre-referral. Pearson Chi square test was conducted to assess the associations between pre-referral and the characteristics of study participants. Binary logistic regression was conducted for each of the clinical characteristics of study participants with binary outcome of pre-referral. Independent characteristics with p-value < 0.05, including Rapid diagnostic test result, diarrhea condition, fever, fast breathing, and danger sign were included in the multivariate analysis. Significance was set at a p-value < 0.05.

Results

The background characteristics of children under five years of age in the study.

Of the 1,086 children referred, 55.6% are children of 12 months and above with a mean age of 24.6 months (SD = 17). The distribution of characteristics with regard to pre-referral, showed a significant association with RDT positive patients, diarrhea, pneumonia and children with danger signs. Only Twelve percent (12%) of the referred children received pre-referral treatment during implementation. The characteristics are shown in Table 1.

Table 1
Background and clinical characteristics

Characteristic/variables	All	Pre-referral treatment		P-value
	N = 1,086 n(%)	No, n (%)	Yes, n (%)	
Gender	540 (50)	364(85)	64 (15)	0.772
Male	537 (50)	367(85)	61 (15)	
Female				
Age category	482 (44)	335 (85)	60 (15)	0.671
< 12 months	604 (56)	400 (86)	66(14)	
≥ 12 months				
Mean = 24.5 months (<i>SD</i> = 17)				
RDT results	717 (85)	501 (89)	62 (11)	< 0.001*
Negative	123 (15)	69 (64)	38 (36)	
Positive				
Diarrhea	967 (89)	664 (88)	94 (12)	< 0.001*
No	119 (11)	71 (69)	32 (31)	
Yes				
Fast breathing	924 (85)	636 (88)	91 (12)	< 0.001*
No	162 (15)	99 (74)	35 (26)	
Yes				
Fever	407 (37)	265 (85)	45 (15)	0.941
No	679 (63)	470 (85)	81 (15)	
Yes				
Danger signs	909 (84)	654 (90)	73 (10)	< 0.001*
No	177 (16)	81 (60)	53(40)	
Yes				

SD = Standard deviation *significant at $p < 0.05$

Visit within 24 hours	579 (53)	517 (86)	53 (14)	0.823
No	510 (47)	418 (85)	73 (15)	
Yes				
SD = Standard deviation *significant at $p < 0.05$				

Factors associated with pre-referral treatment practices among CHWs

In this study, RDT results, diarrhea, fast breathing and danger signs were independently associated with pre-referral treatment (Table 2). Children presenting with RDT positive results (aOR = 2.9, 95% CI:1.6-5.0), Diarrhea (aOR = 3.8, 95%CI: 2.0-7.1), fast breathing (aOR = 2.3, 95%CI: 1.3-4.0), and danger sign (aOR = 5.6, 95%CI:3.1–10.1) were more likely to be given pre-referral treatment by CHWs. The factors that are associated with pre-referral treatment are shown in Table 2.

Table 2
Factors associated with pre-referral treatment practices among CHWs

Characteristic/variables	Pre-referral treatment		cOR(95%CI)	aOR(95%CI)
	No n (%)	Yes n (%)		
Gender	364(85)	64 (15)	1	
Male	367(85)	61 (15)	0.9 (0.6–1.4)	
Female				
Age category	335 (85)	60 (15)	1	-
< 12 months	400 (86)	66(14)	0.9 (0.6–1.3)	
≥ 12 months				
RDT results	501 (89)	62 (11)	1	-
Negative	69 (64)	38 (36)	4.4 (2.7–7.2)	2.9 (1.6-5.0) *
Positive				
Diarrhea	664 (88)	94 (12)	1	3.8 (2.0-7.1) *
No	71 (69)	32 (31)	3.2 (1.9-5.0)	
Yes				
Fast breathing	636 (88)	91 (12)	1	2.3 (1.3-4.0) *
No	99 (74)	35 (26)	2.4 (1.6–3.8)	
Yes				
Fever	265 (85)	45 (15)	1	-
No	470 (85)	81 (15)	1.0 (0.6–1.5)	
Yes				
Danger signs	654 (90)	73 (10)	1	5.6 (3.1–10.1) **
No	81 (60)	53(40)	5.8 (3.8–8.9)	
Yes				
Visit within 24 hours	517 (86)	53 (14)	1	-
No	418 (85)	73 (15)	1.0 (0.7–1.5)	
Yes				
*significant at $p < 0.01$				

Discussions

The study indicates that a small proportion of children under 5 years of age received pre-referral treatment during the years of implementation period. Pre-referral treatment is a requirement for children who present with a danger sign to the CHWs (19). As with iCCM programs elsewhere, the magnitude of pre-referral treatments rates is low (13, 27). The low pre-referral treatment rates could probably be because the number of children with danger signs that are seen by the CHWs is also low. It is possible that caregivers of children with danger signs go directly to the health facilities as the first point of care due to the anxiety around danger signs(21, 28, 29).

Having a positive Rapid diagnostic test, diarrhea, fast breathing, and danger signs were predictors of pre-referral treatment by a CHW. Studies carried out in various Africa countries showed that a significant number of children under-five with malaria condition were given rectal artesunate as a pre-referral treatment before referral(27, 30). Also, global trends for malaria, diarrhea and pneumonia have remained expressively high and more cases manifest in sub-saharan Africa showing calling for pre-referral treatment among children(31). Children with a positive malaria RDT result, diarrhea and fast breathing are given rectal artesunate, Zinc and Oral rehydration salts and amoxicillin respectively as the pre-referral treatment before they're referred. This is consistent with the iCCM guidelines.

Limitation

The CHW register does not disaggregate the condition for which pre-referral treatment was given. It highlights whether or not pre-referral treatment was given. Nonetheless, the register provides information on the illness for which the child was evaluated by the CHW and whether or not diagnosis was performed.

Additionally, cross sectional study design was used and therefore, temporal relationships between factors and outcomes could not be established.

The data collection tool recommended for use by the CHWs does not record days since disease onset for malaria, diarrhea and pneumonia. The results therefore are limited by that factor.

Conclusions

Pre-referral treatment rates provided by CHWs are comparable to what has been established in many parts of the continent and the cases of under-fives reported to CHWs are generally low while factors identified suggest adherence to iCCM protocols.

Abbreviations

ACT: artemisinin-based combination therapy; AOR: Adjusted Odds Ratio; CHW: Community health worker; CI: confidence interval; iCCM: integrated community case management; p-value: probability value; WHO: World Health Organization

Declarations

Authors' contributions

MM participated in the conception and design of the study, analysis and drafting of the paper. EM, MN, JK, and GS participated in the conception, design of the study and interpretation of findings. AW, PK, SB, BS and DA in implementation and data management while FB participated in the interpretation of findings. All participated in reading final version. MM and EM are guarantors of the paper.

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Conflict of interest

The authors declare that they have no competing interests.

Ethical considerations

Ethical approval and consent to participate

This study involved human participants and was approved by the Mbarara University of Science and Technology's Research ethics committee. Permission was sought and granted with study number No. 06/03-17 and Uganda National Council of Science and Technology approval was given with study number SS 4299.

Since the study involved only analysis of deidentified clinical records, consent was not obtained from individual patients' caregivers for the study. Informed consent was waived by the Mbarara University of Science and Technology's Research ethics committee. All the experiments in the study were conducted in accordance to the Declaration of Helsinki.

Consent for publication

Not Applicable

Availability of data and materials

Data are available upon reasonable request. This data are available for non-commercial use from the corresponding author (emulogo2000@gmail.com) upon reasonable request.

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