Contribution of Community Health Workers to the treatment of common illnesses among under 5-year-olds in rural Uganda.

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Abstract

Introduction

The control of malaria, pneumonia, and diarrhea is important for the reduction in morbidity and mortality among children under five years. Uganda has adopted the Integrated Community Case Management strategy using Community Health Workers to address this challenge. The extent and trend of these three conditions managed by the Community Health Workers are not well documented. This study was done to document Community Health Workers' contribution towards treatment and the trends of the three common illnesses in Bugoye Sub-County in rural Uganda.

Introduction

Malaria, pneumonia, and diarrhea are still among the commonest causes of childhood morbidity and mortality globally in, sub-Saharan Africa and in Uganda [1&2]. Volunteer Community Health Workers (CHWs) are community members who are selected by fellow community members to provide accurate health information, counsel, mobilize communities and provide linkage for curative, prevention, health promotion, and care services. World Health Organization (WHO) estimates that 57 countries in Asia and Africa including Uganda are using the Integrated Community Case Management (ICCM) strategy for the management of childhood illnesses in the community [2, 3, 4, 5, 6 &26].

The Ministry of Health (MoH) in Uganda established Community Health Workers in 2001 and the integrated Community Case Management guidelines in 2010 to improve access to Universal Primary Health Care. Their role and contribution to the community management of the three commonest childhood illnesses have been proved to be quite crucial and successful especially in the rural areas that have limited access to health care [2, 7, 8, 9, 10, 26 & 28]. The WHO and UNICEF in 2006 developed a manual on the management of the sick child by Community Health Workers with various case studies and models including the homapak (malaria treatment) strategy in Uganda and these were demonstrated to have positive outcomes for the specific illnesses [11, 12 & 26].

Using the Uganda MoH training guidelines, Community Health Workers (CHW/VHTs) are trained for 5 days during the initial training and later trained for additional 5 days on the Integrated Community Case Management (ICCM) full package by the National Training Staff. Community Health Workers in Uganda under the Integrated Community Case Management (ICCM) strategy are involved in testing for malaria using Rapid Diagnostic Test (RDT) kits, assessing and treating of pneumonia and diarrhea, and other prevention and health promotion activities in the community under the supervision of trained health workers at the health facility in the catchment area [3,13,14,15,16,17&26].

Community Health Workers report quarterly on all these indicators to the National District Health Information Software 2 (DHIS2). There has been limited data for long-term trends of these major cases seen by the CHWs over years in Uganda. There is limited documentation of the trends of the common

illnesses managed by Community Health Workers in the rural community within Bugoye Sub-County. This study will focus on documenting the above gaps in Kasese district, Southwestern Uganda.

Methods

The aim was to determine the epidemiology and a trend of the three most common illnesses among children less than five years of age for the period April 2014 to December 2018 in rural Bugoye Sub-County in Kasese district, Uganda. A retrospective review of monthly morbidity reporting data of the Community Health Workers for children less than five years of age was done. The data contained information on age, sex, diagnosis (malaria, pneumonia, and diarrhea), and their respective treatment. Cleaning, validating, and analysis of this Integrated Community Case Management data was done for the period April 2014 to December 2018. This is data collected every month at Bugoye Health Centre III a government health facility by the Community Health Workers in the catchment area supervised by the health facility.

Study setting

Bugoye Health Centre III is situated in Bugoye Sub-County which is located in Kasese district in southwestern Uganda. The population served by the health Centre is approximately 46,124 of which 9,225 are children under five years of age, it has 7,650 households in 35 villages. This data included 5 villages in 2014 and 2015, 8 villages in 2016, 2017, and 2018 where the ICCM program was gradually being rolled out.

Data collection

Data from the monthly Integrated Community Case Management reporting forms were aggregated and entered into a database in Epi-Data software from April 2014 to December 2018. Data were then cleaned with comparison to paper records in case of a mismatch between reporting month and visit date or potential inaccuracy. This data set is available for any required review.

Data analysis

The data set was exported to STATA 14 and analyses were done for the demographic characteristics, epidemiology, and trends of the cases that are seen and managed by the Community Health Workers and the proportions of the prevalence of the three most common illnesses among the under-five-year-olds. Bivariate logistic regression for odds of the association was also done with the demographic characteristics (sex and age categories) and the common illnesses for an association between the demographic characteristics and the common illnesses. The independent variables included age category and sex, and the outcome was malaria cases, pneumonia cases, and diarrhea cases.

Ethical Issues

This study was approved by the Research Ethics Committee of Mbarara University of Science and Technology and permission was got from the Kasese District administration to analyze and use the facility data. The analysis of the data was anonymous so consent for the individual cases was not done as they had identification numbers that were randomly allocated and kept anonymous. (Study number: 06/03-17).

Results

Demographic characteristics of children managed by the Community Health Workers

The total number of child encounters of the Community Health Workers reviewed was 18,430 and males were 50.2% (9,192) females were 49.8% (9,105). These children were from eight villages and four parishes from Bugoye Sub-County in the Kasese district, details in Table 1.

Amongst the three diagnosed illnesses managed by the Community Health Workers, Pneumonia was the highest cause of illness among the infants (< 1year) while malaria was the highest cause of illness among the children 1 year to 59 months, details in Table 2.

The three common illnesses of malaria, pneumonia, and diarrhea were prevalent every month and throughout the years from 2014 to 2018. Single infection with one of the three illnesses was a common occurrence and malaria was the commonest illness while diarrhea was the least common throughout the review, details in figure 1.

Multiple illnesses were prevalent every month of the year and over the whole study period. Combined illness with malaria and pneumonia was the commonest while the combination of malaria, pneumonia, and diarrhea was the least common. Figure 2 shows the trends of multiple illnesses.

Having less than 1 year of age was associated with a higher risk of getting diarrhea OR 0.8 CI: 0.72–0.85 compared to “12–24” months of age and also higher risk of pneumonia OR 0.7 CI: 0.60–0.71 compared to “12–24” months of age but lower risk of getting malaria, see Table 3.

Discussion

Malaria, pneumonia, and diarrhea remain the three commonest causes of illness in Bugoye Sub-County for the period of 2014 to 2018 just like the other parts of Africa and Uganda which had similar documentation [1, 15 &18]. This current study was conducted like several other findings also showed that although most children had single infections, twenty-five percent had duo illnesses or triple illnesses for the three commonest illnesses of malaria pneumonia, and diarrhea. The findings are similar to six other Sub-Saharan countries in Africa including Uganda [18 & 19].

The treatment of children under five years of age for malaria, pneumonia, and diarrhea are performed by each of the active and trained Community Health Workers in each of the 8 villages in Bugoye Sub-County.

This finding is similar to other countries including Uganda that adopted the Integrated Community Case Management (ICCM) in Africa and some regions in Southeast Asia [3, 4, 5, 7, 8, 14, 15, 17, 20 &27]. Community Health Workers are an important resource in the management of these illnesses.

For the period of our study that is April 2014 to December 2018, out of the 24,000 and more children assessed and treated there was no reported death. This may imply that Community Health Workers' practices are good. This may also be a proxy indicator of good outcomes which are related to other available literature that also indicates good outcomes following treatment by Community Health Workers for the three common illnesses [2, 4, 11, 12, 21, 22 & 23]. This could also mean that the Community Health Workers can identify very sick children with danger signs and refer them

The five-year trend for the three commonest illnesses among children under five years of age in our study had malaria highest followed by pneumonia then diarrhea during the first four years. This changed with illness due to malaria dropping drastically to about the same level as diarrhea. This may be attributed to the malaria control interventions that have been strengthened over the last ten years in Uganda and this has been evidenced by the gradual reduction in malaria test positivity and a drop in all-cause under-five malaria mortality (137 – 64/1000) over the last ten years in Uganda in the World Malaria Report of 2018 of WHO and fact sheet of USAID [24 &25]. The five-year trend of the multiple infections has malaria and pneumonia as the highest followed by malaria and diarrhea then diarrhea and pneumonia and then the triple infection least this is consistent with a study in a Nigerian hospital in 2018 [29].

Limitations

Because of the limited capacity of the Community Health Workers on the understanding of the importance of reporting the data was not complete but this was addressed by crosschecking with the health facility data during the process of cleaning and validating the data.

Conclusion

Community Health Workers are involved in the management of all the three commonest illnesses in Bugoye Sub-County which are malaria, pneumonia, and diarrhea. These illnesses sometimes present as multiple infections with various combinations of pneumonia, malaria, and diarrhea.

The trends of the three commonest illnesses among children under five years of age are changing with pneumonia now becoming the commonest cause of illness since 2017.

Children less than one year of age were associated with a lower risk of having malaria but a higher risk of having pneumonia or diarrhea compared to children 1-5 years of age.

Given the changing disease profile especially in children under one year, the focus of health interventions should put more pronounced emphasis on addressing the prevention and control of pneumonia among these vulnerable age groups of under one-year-old.

Declarations

Ethical approval and consent of participants

Ethical approval for this study was sought and obtained from the Research Ethics Committee at Mbarara University of Science and Technology. Permission to use and analyze the data was got from the Kasase local district authorities.

Availability of data and materials

All data supporting our findings are contained in the paper. There are no restrictions to the data sources, however full details to the data may be accessed on reasonable request from the corresponding author.

Competing interest

The authors declare that there are no competing interests.

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Author's contribution

FB was involved in the design, implementation, data analysis, interpretation of findings, and write-up of the paper. EMM, MN, BB were involved in the conception of the idea, design, implementation, interpretation of findings, and review of the paper. ACW, RN, RM, and SB were involved in the design, implementation, analysis, and write-up of the paper. GS, PP, RR, and DG were involved in the conception of the idea, design, and review, and write-up of the paper. DSA was involved in the interpretation of findings and write-up of the manuscript. All the authors have read and approved this manuscript.

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Abbreviations

CHW: Community Health Worker (VHT: Village Health Team), CI: confidence interval, DHIS: District Health Information System, ICCM: Integrated Community Case Management, OR: Odds Ratio, P-value: Probability RDT: Rapid Diagnostic Test, UNICEF: United Nations Children's Fund, USAID; United States of America Aid & WHO: World Health Organization.

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Tables

Table 1: Sex distribution for the three illness treated by CHWs

	Male n(%)	Female n(%)	Total
2014	864 (49.6)	879 (50.4)	1743
2015	1441 (48.8)	1514 (51.2)	2,955
2016	2016 (50.9)	1948 (49.1)	3,964
2017	2772 (51.2)	2637 (48.8)	5,409
2018	2099 (49.7)	2127 (50.3)	4,226
	9,192 (50.2)	9,105 (49.8)	18,297

Table 2: Illness episodes among the age categories including multiple illnesses

	Age category		
	0 – 11 months	12 – 59 months	Total
Diarrhea	1,338 (32.0)	3,768 (21.1)	5,106
Pneumonia	2,080 (49.7)	6,196 (34.6)	8,276
Malaria	765(18.3)	7,926 (44.3)	8,691
Total	4,183	17,890	

Table 3: Associations of being under 1year of age and having diarrhea, pneumonia, or malaria.

Disease condition	OR	p-value	95% CI
Diarrhea (Under 1-year reference)			
12-24 months	0.8	< 0.001	0.72-0.85
25-59 months	0.4	< 0.001	0.37-0.44
Pneumonia (Under 1-year reference)			
12-24 months	0.7	< 0.001	0.60-0.71
25-59 months	0.4	< 0.001	0.36-0.42
Malaria (Under 1 reference)			
12-24 months	2.1	< 0.001	1.86-2.36
25-59 months	5.2	< 0.001	4.64-5.87

Figures

Figure 1

Five-year trend of the three common illnesses managed by CHWs

Figure 2

Multiple illness trends of the three conditions managed by CHWs