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ORIGINAL ARTICLE

Institutional support to community health workers using integrated management of childhood illness program in Rwanda

Apoio institucional para agentes comunitários de saúde usando o programa de Atenção Integrada às Doenças Prevalentes na Infância em Ruanda

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ABSTRACT

The objective was to explore the support given to community health workers who use the integrated management of childhood illness (IMCI) approach and describe the supervision given to them. A non-experimental, exploratory, descriptive, quantitative design was used for this study. Data were collected using a structured questionnaire; 305 were interviewed (30% sample). The data were double entered, cleaned, and analyzed using Statistics Package of Social Sciences (SPSS) 19. Support and supervision in Rwanda are provided by the base institution and by supervisors. CHWs often had a shortage of drugs and equipment (63.3%) and 87.5% have experienced run out of equipment, medicines, and consumables. This created barriers to caring for sick children. To improve institutional support for community health workers, regular and continuous supportive supervision and supplies are essential.

Descriptors: Community Health Workers; Integrated Management of Childhood Illness; Rwanda.

RESUMO

O objetivo foi explorar o apoio e descrever a supervisão de agentes comunitários de saúde que implementam o programa de atenção integrada às doenças prevalentes na infância (AIDPI). Um desenho não experimental, exploratório, descritivo e quantitativo foi adotado neste estudo. Os dados foram coletados entre 305 participantes (30% da população) por meio de um questionário estruturado. Dupla digitação foi utilizada e os dados foram limpos e analisados usando o *Statistics Package of Social Sciences* (SPSS) 19. Em Ruanda, o apoio e supervisão são fornecidos pela instituição base e supervisores. Os agentes comunitários de saúde (ACS) frequentemente enfrentam escassez de medicamentos e equipamentos (63,3%) e 87,5% ficaram sem equipamentos, medicamentos e consumíveis, o que criou barreiras para a assistência das crianças doentes. Para melhorar o apoio institucional dado aos agentes comunitários de saúde, supervisão de apoio contínua e regular, além do fornecimento de suprimentos, é essencial.

Descritores: Agentes Comunitários de Saúde; Atenção Integrada às Doenças Prevalentes na Infância; Ruanda.

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INTRODUCTION

The mortality of children under the age of five years remains one of the most important public health challenges in developing countries[1]. Globally, 5.9 million children die every year, mostly in low and middle-income countries. Particularly, the regions of sub-Saharan Africa (SSA) account for 50% of deaths[2]. Estimations show that 16,000 children under five die every day and over 60% of global child deaths could be prevented by available and affordable interventions[2]. Rwanda adopted the Integrated Management of Childhood Illness (IMCI) approach as the standard of care for sick children to be implemented by community health workers (CHWs)[3]. However, for CHW to function using the IMCI approach, supervision and support are vital to building CHW capacities in delivering health care to their communities. All CHWs who use the IMCI approach requires support, supplies, and supervision from facility-based services to be successful in caring for sick children.

Health services in Rwanda are provided through the public sector, government-assisted health facilities, private health facilities, and traditional healers. It is decentralized to six levels, such as: Central ministry of health; referral hospitals; provincial hospitals; district hospitals; health centers, community health workers[4]. The community level is the lowest level of the health system in Rwanda and is operated using CHWs who are selected from the community. Rwanda adopted IMCI as the standard of care for children using community health workers and they have an important role to play in health promotion, disease prevention, basic curative care and referrals, monitoring of health indicators, and creating vital linkages between community and formal health systems[3]. In Rwanda, the CHWs provide basic clinical care to children under five years, prevention of diseases, and health promotion across the whole nation and are free of charge[3,5]. These are thought to be due to poor access to health services and lack of immediate care when the child gets sick; delays in seeking treatment at health centers; and shortage of health workers[3,6].

Rwanda adopted the IMCI approach as the standard of care for sick children using Community Health Workers in 2000 and is implemented at four levels: At the first level, there are health committees at an administrative District level that supervise the health centers. At the second level, i.e. Health center level, the health committees that form the main part of IMCI operate in terms of planning, monitoring, and evaluating health activities. Then, the third level is the cell level, where there are coordination and compilation of data of community health activities from the villages which are then reported to the health center. At last, the fourth level is the village level, where two CHWs Binomes (man and woman) are in charge of caring for children under five years by providing case management of children with fever, diarrhea, acute respiratory problems, and malnutrition[3-4].

Infant mortality is one of the most universally accepted indicators of health status[7]. Infant mortality rates (IMR) are higher in low-income countries than in high-income countries[7]. Many infants and children under five years die with little or no contact with professional health providers[1]. Factors attributed to these deaths include poor access to health services, insufficient resources at the household level, poor knowledge and practice among caregivers, and inadequate quality of health facilities[8]. Studies have shown that malaria, pneumonia, diarrhea, malnutrition and measles account for more than half (52%) of these deaths[1,9].

Rwanda adopted the IMCI program for CHWs to use for the management of sick children, as a strategy that could help to reduce childhood illness and child mortality rate[3]. Implementation of the IMCI program, using CHWs for management of sick children, aims to reach those Rwandan children who are far from health centers within 24 hours of becoming ill. CHWs also disseminate information to parents and other caregivers about danger signs to improve care-seeking behaviour.

For CHWs to provide this service they need knowledge, supplies, drugs, and equipment. Supervision and support are also essential to maintain the performance of CHWs after competency-based training[10]. Supportive supervision is defined as a process of guiding, helping and encouraging health workers to improve their performance so that they can meet the standards of performance defined by their country[11]. Supervision is widely recognized as one key way of improving CHWs' performance and motivation, and it often includes clinical practice observation, reviewing records and problem solving[12]. When supervision is done well in a favorable environment, objective expectations, performance monitoring, auditing of records, interpreting of data, clinical performance monitoring and observation of health workers can be seen as a positive experience[13]. However, many supervisors' performance may be inadequate and ineffective as they do not provide constructive feedback to the personnel they supervise. A study in Malawi showed that supervisors lacked knowledge and gave inconsistent advice[14], while another documented that supervisors only talk to their staff instead of observing them[15].

The supervisor's attitude and behaviour toward CHWs may be a contributing factor in these workers' level of motivation[16]. Despite these shortcomings, regular supervision has been found to reduce CHWs' sense of isolation, help to increase their level of motivation and to sustain their interest in the work they do[16]. Factors like regular provision of drugs and equipment, observing how CHWs assess and treat sick children, answering questions, teaching and helping with problem-solving and regular supportive supervision have

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been seen to improve the health workers' effectiveness. Failure to meet these expectations will destroy not only the image of CHWs but also the success of the IMCI program[16].

In 2020, the Rwanda IMR was at 26.5 deaths per 1,000 live births and under-five mortality rate was 29.8 deaths per 1,000 live births[17-18]. The most prevalent diseases/conditions responsible for child morbidity and mortality under five years in Rwanda are malaria, pneumonia, diarrhea and malnutrition[4]. There is a shortage of health workers with only one physician per 16,001 inhabitants and one nurse per 1,291 inhabitants[5]. Health facilities are inaccessible with a quarter of all patients having to walk for more than one hour or five kilometers to reach the nearest health facility[4].

The mortality of children under the age of five remains one of the most important public health challenges in low-income countries, especially in Rwanda, where the mortality among children under five years is high. CHWs have been trained to use the IMCI approach when managing sick children; this identifies the most vulnerable children and treatment can be supplied timeously. However, CHWs practice in isolated, hard-to-reach areas requires them to be adequately trained to use the IMCI approach. Moreover, CHWs should be supported by the Ministry of Health with supplies, drugs, equipment, knowledge, and supervision to provide good quality of care. Without this support, the early gains previously made in the reduction of IMR in Rwanda will not be sustained. Limited information is available related to the support needed of CHWs to provide IMCI in the Huye district in Rwanda.

Previous evaluations carried out by the Ministry of Health in 2014 suggest that the majority of CHWs have less than one year of experience and have received training for four days and two days for practice in the health center[19]. Supervision is lacking with only one visit every three months. CHWs lack basic education, and more than 72% of them only have a primary level of education.

The findings of this study will contribute to improving health care delivery by CHWs using case management to childhood illness. The findings will also generate evidence which health care providers and policymakers can use to develop new alternatives to improve the quality of care and to provide necessary information to nursing educators during developing and implementing their curricula. In nursing research, findings from this study will contribute to new research knowledge that can be used as baseline data and for further investigations on the subject to provide more and new insight concerning community health.

The purpose of this study was to explore and describe the institutional support provided to CHWs using the IMCI approach when consulting with sick children in Huye District, Rwanda.

The objectives of the study were:

- To explore the support given to community health workers who use the integrated management of childhood illness approach in the Huye District of Rwanda.
- To describe the supervision given to CHWs involved in integrated management of childhood illness at the aforementioned district.
- To identify the training needs of CHWs' who use the integrated management of childhood illness approach in the Huye District.
- To evaluate the availability of resources for CHWs using the integrated management of childhood illness approach in the Huye District.

METHOD

For this study, a non-experimental exploratory descriptive design was used to help the researcher understand the phenomenon under investigation. It allowed the researcher to gain more information about the characteristics of that phenomenon[6,19]. The study was undertaken in Huye District, Rwanda. Huye District is one of eight districts in the Southern Province of Rwanda. This province is predominantly rural with a population of 290,677 inhabitants. It has 14 sectors, each sector having one health center. Within the 14 sectors, there are 509 villages with approximately 36 villages per sector. Each village has four community health workers, of which two community health workers (in each village) are trained in the Integrated Management of Childhood Illness approach. This means there are approximately 72 CHWs involved in IMCI programs in each sector. The target population for this study was CHWs who have been trained by the Ministry of Health, to use the IMCI algorithm when consulting and treating sick children at the community level. According to Rwanda's Ministry of Health Report, the total number of CHWs using the IMCI approach in Huye District is 1,018 and these were considered to be the target population in this study[4]. CHW Binomes were selected. Binomes are defined as a pair of female and male CHWs, selected by the population in each village that is involved in IMCI to deliver health services at the village level[20].

A probability or random sampling method was used as the sampling technique for this study. The probability sampling method refers to the fact that every member (element) of the population has an equal chance of selection[6]. Since this is a descriptive study, a random sample of 30% of the CHW Binomes was considered to be adequate, allowing for a 15% refusal rate. Assuming that at least 85% of these CHWs would agree to participate in the study, the researcher aimed to recruit 305 CHW Binomes from the total target population of 1,018 CHW Binomes. The first stage of the sampling strategy consisted of the random selection of five of

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the 14 sectors in the Huye District of Rwanda using a fishbowl technique, as described by Brink[21]. The second stage of the sampling strategy consisted of a census of all CHWs from the selected sectors who were trained to use the IMCI approach. The researcher approached the leaders of selected sectors to get a list of all CHWs and the villages they served. All CHWs in the selected sectors were approached to participate in the study.

Only CHWs who met the following criteria were included in the study:

- Participants had to be CHWs elected by the population to work at the community level.
- They also had to have additional training in IMCI and be working at Huye district as CHW Binomes.
- Participants had to be working and residing in the village and be using the IMCI approach to the management of sick children in their village.

To ensure content validity the questionnaire was developed taking into consideration the research objectives, literature review, as well as a conceptual framework. Table 1 shows how the research questions correlate to the conceptual framework and interview questionnaire. Once the questionnaire was developed, an IMCI expert was asked to review the questionnaire to ensure all aspects relevant to the study were adequately and comprehensively covered.

Table 1. Content validity, Rwanda, 2018.

Objectives	Conceptual framework	Questions
Explore the support given to CHWs who use the IMCI approach.	Donabedian's structure: support from institutional	Section B: B1- B2
Describe the supervision given to CHWs involved in the IMCI approach	Donabedian's structure: (Supportive supervision, Supply with drugs, continuing training)	Section B: B3 – B17
Identify training needs of CHWs' who use the IMCI approach	Donabedian's structure: Human resources (basis training in IMCI and training refreshment)	Section C: C1 – C8
Evaluate the availability of resources for CHWs using the IMCI approach	Donabedian's structure: Physical Resources (Material resources equipment; medicines and consumables, etc.).	Section D: D1 – D14

The data were collected using a questionnaire administered through an interview. A structured interview was chosen as many CHWs lacked the skill to complete a self-administered questionnaire; the majority of CHWs in Rwanda (72%) have a primary level of education. The questionnaire was adapted from a tool developed by the Rwanda Ministry of Health[3,6]. The researcher conducted a pilot study with 10 CHWs at two different points in time, one week apart, to verify the stability of their responses. To avoid contamination of the sample, 10 CHWs were randomly selected from a village far from the sample. The pilot study served two purposes: The first was to help the researcher test the wording and translation of the questionnaire for any ambiguities. At this point, three questions were reformulated by the researcher to make them clearer. The second was to assess the test-retest stability of the questionnaire. The findings from the pilot study showed that more than 78% of respondents provided the same response to the same question.

Changes were made to this tool by the researcher to answer the research objectives, questions and in response to a literature review. To ensure content validity, an external IMCI expert was asked to review the questionnaire to ensure all aspects relevant to the study were adequately and comprehensively covered. Open and closed-ended questions were included in the instrument to give respondents a chance to explain themselves and to give richness and fullness to the data. The interview was conducted in the local language of Kinyarwanda by the researcher and five nurses trained as data collectors. Section A of the questionnaire included ten items to obtain demographic information about the respondents. This was specifically included to describe the sample. Section B of the questionnaire covered all aspects of support and supervision, while section C identifies the training needs of CHWs, and section D evaluates the availability of the resources for CHWs using the IMCI approach. The result of each question is reported individually. Selection bias was avoided through a random selection of five of the fourteen sectors of Huye District, followed by a census of all IMCI trained CHWs in those sectors.

During data analysis, the completed questionnaires were put into bundles of 50 and were numbered by the researcher. Data was gathered by the researcher and a second data entry clerk. The two databases were taken to a statistician who merged the databases to identify gathering errors and corrections were made from the data source until it was validated with zero mistakes. The final database was checked, cleaned and explored through a graphical display, then analyzed, interpreted and summarized. Data analysis was performed using the Statistics Package of Social Sciences (SPSS), Version 19.

This study was conducted at the time the researcher was doing her master's degree at the University of Kwa-Zulu-

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Natal in South Africa. Prior to data collection, the researcher obtained ethical approval from the ethics committee of the University of Kwa-Zulu-Natal (HSS/0282/011M). Because the research site was in Rwanda, the researcher also obtained permission to conduct the research from the authorities of Huye district in Rwanda (Huye/3106/0204). The autonomy of the respondents was ensured by explaining the purpose and significance of the study to them; obtaining their informed consent; emphasizing that participation was free and voluntary and that they had the right to withdraw from the study at any time without any negative consequences. In addition, the respondents were informed about the non-monetary associated benefits for their participation i.e., a possible improvement in the care of sick children in their community. To meet the beneficence principle, the researcher acted with kindness and that went beyond strict obligation. Every prospective participant was not obliged to participate in the study; their decision was free and voluntary based on their knowledge of any negative consequences. In this study, the researcher respected justice during the selection, and recruitment of participants and everyone had an equal chance to be selected.

The participants were also treated in the same way and received equal benefits from the results of their participation in the research through the recommendations that would be developed. The researcher did not offer any incentives to the participants to avoid any undue influence on the decision to participate in the study. The respondents' anonymity and confidentiality were assured by using the codes instead of their names, hence no information could be linked to specific respondents. Furthermore, confidentiality was guaranteed through the storing of the completed interview questionnaire in a safe locked place where the researcher and research supervisor had access.

The data were collected by the researcher and five nurses who were trained as data collectors. It took 30 days to reach the 305 CHW Binomes, which was our sample size. The CHW Binomes visited their proper villages and were approached by the researcher and fulfilled the full interview questionnaire together with trained nurses. All fulfilled questionnaires were collected and grouped by the team leader according to each data collector and submitted to the researcher, who checked each of those questionnaires and checked if all questions were answered and completed by data collectors. Feedback was given to them the following day and if there was any confusion, it was discussed. All information was clearly described before starting the data collection to improve the response rate.

RESULTS

Three hundred and forty-six (346) questionnaires were printed of which 305 were returned by the data collectors as completed questionnaires. The sample size was 305, which represented 30% of the CHW Binomes at Huye district from the total target population of 1,008 CHW Binomes. The demographic characteristics of the IMCI trained CHWs are shown in Table 2.

Table 2. Demographic characteristics of IMCI trained CHWs, Rwanda, 2018.

Characteristics	
Variable	
Age	
Maximum age	62 years
Minimum age	23 years
Median age	38 years
Gender	
Male	154 (50.5%)
Female	151 (49.5%)
Education	
Primary education	67.2%
Post-primary education	28.5%
Secondary education	4.3%
Tertiary education	0%
Experience in IMCI	
Less than 1 year	6%
1-5 years	74.4%
More than 5 years	19.6%
Number of households for which they are responsible	
Minimum	6 households
Maximum	523 households
Median	114 households

Knowledge and skills

Of the CHW Binomes in this study, 55.5% (n=167) had received five days of training, 40.2% (n=121) received less than five days of training and 4.3% (n=13) received more than five days of training (*1=missing data). The majority of CHWs (85.5%, n=257) believed that the duration of training was insufficient and 98.3% (n=298) CHWs showed the need for a refresher course.

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Support and supervision by trained supervisors

Table 3 shows supervisory visits received by CHWs after training.

Table 3. Timing of supervisory visits following IMCI training, Rwanda, 2018.

Timing of supervisory visit following IMCI training	Frequency	Percent
Visited within 0 – 3 months	149	50.4
Visited within 4 – 6 months	47	15.9
Visited within 7 – 9 months	16	11.9
Visited within 10 – 12 months	1	0.3
Visited after 12 months	2	0.6
Never visited	82	27.7

The majority of IMCI CHWs, 197 (64.6%), reported that their supervisors did not observe them when they were examining sick children during the last visit and 188 (62.3%) IMCI CHWs reported that their supervisor did not give them any additional information during the last visit. The findings showed that the time spent was not standardized as some respondents mentioned in Table 4. There were 66.4% of CHW Binomes who reported that they were not notified of their supervisor's visits.

Table 4. Time the supervisor spends in your presence during the last visit, Rwanda, 2018.

Time spend/ In minute	Frequency	Percent
0-30 minutes	129	43.6
31-60 minutes	118	39.9
More than 60 minutes	49	16.5

Support and supervision by the institutions

CHW Binomes mentioned that they were supplied with equipment (97%) and drugs (97%), but 87.5% of them experienced occasional run-out with the supply of drugs and equipment. We asked IMCI CHWs if they experienced drugs or surgical supplies shortages that prevented them to provide care within the last month. Hundred and eight two (59.7%) respondents had to wait between four hours to six days for supplies when they were short of supplies, 67 (22%) respondents were resupplied within less than four hours of them running out and 56 (18.3%) respondents had to wait seven or more days to be resupplied. Children still need to be managed in a manner that protects them despite CHW Binomes experienced a shortage of drugs and equipment.

Most of CHW Binomes (82.3%) notified their supervisors when they ran out, but their supervisors did not supply them during their visit. Ways in which IMCI CHWs deal with running out of supplies and drugs vary, see Table 5.

Table 5. How do you manage sick children when you run out of drugs?, Rwanda, 2018.

	Frequency	Percent
Transfer the sick children to a health facility	114	32.6
Borrow drugs from their colleagues to treat the sick children which they then reimburse when their supplies arrive	112	32
Send the sick children to their colleagues	107	30.6
Reported that they send the sick children to their CHWs cell coordinator	10	2.8
Go to the health facility to fetch other medicines which they then use to treat the sick children.	7	2

DISCUSSION

Demographically, the median age of respondents was 38 years and the mode was 32 years, mostly married with dependents, and had low levels of basic education. Because they had only basic levels of education, it would be important for them to receive good training so that they know what is expected of them and can deliver this. The studies showed that as the level of education is increased, as there is an increase in learning facilities[20,22]. In addition, for the persons with low level, good training, refreshment, follow-up visit, and supportive supervision could contribute to increasing the CHWs' knowledge[21].

Many CHW Binomes in our study practiced for at least a year and 79.6% of them had a large number (three to five) children and more than 44% of respondents had other dependents persons to care for. It is presumed after a year of practicing as a CHW Binomes, the CHWs would have had enough experience to cope with managing sick children in the community, however, this is not supported by our findings. The majority of CHW Binomes (74.4%) were elected for a period of between one to five years. Twenty percent (20%) of them were unable to identify any danger signs at all. The danger signs that 75.1% of CHW Binomes missed was identifying when a child is unable to drink or breastfeed.

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Given that most CHW Binomes in Huye received five days or less of training, in addition to their poor educational levels (67.2% with primary education level), it is an indication of why CHW Binomes had poor knowledge about IMCI. Studies undertaken in the USA, England and Wales supported that the experienced CHWs are productive and efficient in their professional role[22].

Support was defined as a process to assist, protect or supply the CHWs involved in IMCI[22]. The lack of support for CHWs to use the IMCI approach, e.g. the lack of and availability of equipment, drugs and supplies at the community level, impacted negatively the morale of CHWs and subsequently their practice[23]. CHW Binomes involved in IMCI in the Huye district felt they were supported by their institutions. Participants indicated that they were supplied with equipment, drugs, and supplies but not sufficient supervision. They did occasionally run out of supplies.

In this study, we used the Donabedian model as the conceptual framework. Donabedian's structure/process/outcome model is the most widely referenced model of quality care in health services and it has been used to develop quality management programs and conduct improvement studies and research[24]. The first aspect of the Donabedian model consists of structural measures of quality and is defined as the professional and organizational resources needed to provide quality care. The second aspect of the model refers to process measures that relate to the things done to and for the patient by practitioners in the course of treatment[24]. Finally, outcome measures are the desired states resulting from care processes, which may include a reduction in morbidity, mortality, and improvement of quality of life[24]. They also include patient satisfaction with care.

The structural aspect of the Donabedian model, which deals with physical resources, was not always in place for CHW Binomes to achieve good processes and outcomes. Ensuring a constant supply of equipment and drugs is only one aspect of support.

When CHW Binomes were asked about the support they received from their institutions, many reported that they received support with problem-solving, answering questions, and teaching. Support was also frequent and regular; mostly monthly and six monthlies. A study in Mali reports that regular provision of drugs and equipment, including observing Binomes conducting assessment and treatment of sick children, answering questions, teaching and regular support with problem-solving, improved the health worker's effectiveness. Failure to deliver this support has a negative impact on the image of CHWs but also the success of the programs[16].

In our study, twenty percent of CHW Binomes admitted that they experience a shortage of drug supplies in the last month before the study and that the average waiting time was up to six days to be re-supplied. CHW Binomes had developed ways of coping with a shortage of supplies, but shortages of drugs particularly negatively impacted the management of sick children[23]. Many studies identified that unreliable provision of consumables, drug supplies and equipment are a weak link in CHWs' effectiveness[23,25]. Inadequate drug supplies, repeated shortages of drugs, and the long duration of waiting for drug supplies are seen as devaluing factors by all CHW programs and negatively impact the morale of CHWs[23].

Supervision is a structure in the Donabedian model. By definition, supervision is a process to oversee or watch over activities, to monitor and observe clinical performance, audit records, interpret data, and give praise and/or correction to improve practice[24]. Supervision was a problem in the Huye district as some CHW Binomes reported no supervision. Supportive supervision from formal health services is critical to CHWs' success[15]. Supportive supervision includes not just watching CHW Binomes and correcting them but providing opportunities to teach, disseminate new knowledge, discuss new policies, and keep CHW Binomes up to date with new knowledge[13].

Several CHW Binomes reported not learning any new knowledge during the visits from the supervisors. During a study in Benin, many supervisors are seen as inadequate and ineffective and not providing constructive feedback to CHWs on their performances. Supervisors often do not have the necessary skills to supervise[15]. In addition, weak supportive supervision contributes to ineffective CHW programs. It is recommended that an improved supportive supervision program for institutional supervisors, accompanied by specific training on how to provide supportive supervision, is necessary[13,15].

Due to time and cost constraints, the study was limited to one of eight districts of the Southern Province. Therefore, the findings cannot be generalized in the Southern province. The researcher only used Donabedian's structure to explore institutional support towards CHWs using IMCI. The researcher used the quantitative approach only. However, a qualitative approach would assist to further explore institutional support to CHWs using IMCI in Rwanda.

CONCLUSION

The IMCI approach using CHWs is an effective strategy to address the issues related to child morbidity and mortality in developing countries, especially in Rwanda. CHWs have an important role to play in health promotion, disease prevention, basic curative care and referrals, monitoring of health indicators, as well as creating vital linkages between community and formal health systems. They provide case management for sick children with acute respiratory infections, diarrhea, measles, malaria, and malnutrition.

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However, for CHWs to function using the IMCI approach, institutional support is vital. All CHWs who use the IMCI approach requires support, supplies, and supervision from facility-based services to succeed. This study explored the institutional support for CHW Binomes using IMCI at Huye and found that there was a lack of supportive supervision, insufficient CHWs' training, and poor knowledge of IMCI. These aspects could all be attended to through strengthened supervision, training and addressing the issue of running out of supplies, drugs, and equipment.

The findings of this study will contribute to improving health care delivery by CHWs using case management to childhood illness with a result to reduce the mortality rate. They will also generate evidence on which health care providers and policymakers can develop new alternatives to improve the quality of care and also provide necessary information to nursing educators when developing and implementing their curricula. Findings from this study contribute with baseline data to support further investigations on the subject to provide more and new insight concerning community health. Documented evidence needs more focused institutional support for community health workers who use the IMCI approach.

We recommend the supportive supervision of CHW Binomes. Supervisors may not have a clear understanding of their role, thus a further qualitative study is recommended to explore their perceptions of supportive supervision. Training of supervisors is needed to provide supportive supervision. It is essential that all supervisors have clear job descriptions and their performance needs to be evaluated on an ongoing basis. All supervisors need to be held accountable for the supportive supervision they provide to CHW Binomes. It is also recommended to strengthen the institutional support to CHWs through regular provision of drugs, supplies, and equipment, as well as developing strategies to prevent and/or address the run out of drugs, supplies, and equipment.

Because there is poor knowledge of IMCI among the CHW Binomes in the Huye district it is essential for further training to take place. It may be necessary for all CHW Binomes to complete a full IMCI training course again to ensure a basic level of knowledge and skills in the use of IMCI for the management of sick children. Refresher training needs to be undertaken regularly and it is recommended that one day a month would be useful to keep the CHW Binomes updated on IMCI. Further training on malaria, especially as this is the most common cause of death in children under five years old in Rwanda, would be beneficial. This should include techniques of testing for malaria and the interpretation of results.

This study was undertaken in one district in Rwanda. As this is a descriptive study, the findings cannot be generalized. For this reason, it is recommended that a bigger nation-wide study especially to determine if the weaknesses found in training and knowledge of CHW Binomes are widespread. Follow-up training or refresher courses are recommended.

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