Original article

Quality of health worker and caregiver interaction during child vaccination sessions: A qualitative study from Benishangul-Gumuz region of Ethiopia

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Abstract

Introduction: Benishangul-Gumuz is one of nine regions in Ethiopia, located in the north-west of the country. The region has low immunization coverage, and a corresponding high risk to children from vaccine-preventable diseases. Adequate and clear communication during immunization sessions is a key factor that influences caregivers to adhere to the vaccination schedule and continue to bring children for vaccination. This study aims to explore the quality of interaction between health workers and caregivers during vaccination sessions, and to identify communication gaps that impact on the continued use of the vaccination service.

Methods: This cross-sectional qualitative study was carried out using in-depth interviews with health workers who provide vaccination at health facilities, observation of the interactions between vaccinators and caregivers during vaccination sessions, and exit interviews of caregivers. Health workers who provided vaccinations in 12 health facilities based in central and remote parts of the region were interviewed. A total of 79 vaccination sessions in the 12 health facilities were observed and caregivers were interviewed on exit.

Results: Health workers at the health facilities expressed that they enjoy the work they do to get children vaccinated, while caregivers who brought their children for vaccination described the vaccinators as friendly and supportive. Not all health workers explain the purpose of the immunization card to caregivers, hence caregivers do not give due attention to the importance of the card. Some caregivers forget to bring the immunization card with them to vaccination session. In some institutions, those who did not bring the immunization card were refused the service. Health workers write the date of the next vaccination on immunization cards. The majority of caregivers, however, cannot read, so do not understand the return date, type of vaccine, or the purpose of the vaccine given. Caregivers agree that their children should get all vaccines recommended by health workers. Vaccination is scheduled twice weekly at health centers and once weekly at health posts. The BCG and measles vaccination is scheduled monthly. However, when there are uncertainties regarding the availability and/or transportation of vaccines for the scheduled day, health workers do not tell caregivers when the next vaccination date will be. Health workers work with community volunteers to pass on immunization messages house to house.

Conclusions: Health workers do not communicate all key immunization messages to caregivers during vaccination sessions. Training health workers in health facilities on the essentials of immunization and interpersonal communication is important to ensure the continued use of the vaccination service by caregivers.
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Introduction

Globally, two to three million children die from vaccine preventable-diseases annually. Immunization remains a reliable high-impact strategy to decrease deaths from vaccine-preventable diseases, and a key strategy to attain Sustainable Development Goal 3, which aims to decrease mortality in under-fives to 25/1,000 live births by 2030 (1). Immunization has enabled disease eradication, and achieved substantial gains in improved child survival (2-5). Despite the significant progress, global immunization coverage has remained steady at 84-86% since 2010, and several of the World Health Organization member countries, including Ethiopia, are trying hard to meet the 90% coverage target for the Pentavalent 3 vaccine (6).

In Ethiopia, the Expanded Program on Immunization (EPI) includes BCG and polio vaccine given at birth, while the DPT-HepB-HiB (Pentavalent vaccine), OPV and PCV vaccines are given at 6, 10 and 14 weeks after birth. Measles-containing vaccine is given at 9 months (MCV1) and repeated after 6 months (MCV2); rotavirus vaccine is given at 6 and 10 weeks; IPV is given at 14 weeks; and HPV vaccine is given at 14 years (7).

The Ethiopia Demographic Health Survey (EDHS) has shown consistent but below-expected improvement in national EPI coverage in recent years, from 18% in 2000 for all basic immunizations to 39% in 2016. Benishangul-Gumuz, in the north-west of Ethiopia, is one of the regions that over the past several years has performed poorly with routine immunization coverage. In 2016, the proportion of children in the region aged 12 to 23 months who received all basic vaccination was 57%, compared to coverages of 89% in Addis Ababa and 67% in Tigray region (8).

Childhood vaccination requires multiple service contacts. The quality of communication between health workers and caregivers at the time of children's vaccinations at health facilities or outreach sites can either encourage or hinder caregivers' return, and hence has an impact on continued child vaccination (9). Communication alone cannot address all aspects of vaccine uptake or refusal. However, communication during vaccination sessions is an important component of vaccination, and inadequate communication can

have a negative impact on vaccination coverage, completion, and parental trust in vaccination (10).

In most health facilities, communication about childhood vaccination is common, but there is uncertainty around how people perceive and understand this communication, and whether and how this influences their decision to continue to vaccinate. A caregiver may feel that they have been embarrassed or treated rudely at a vaccination session, or they may be upset because the health worker did not explain the side effects or advise on the follow-up dose. Such unpleasant experiences during the first or a subsequent contact, or if the caregiver does not understand the date or importance of the next scheduled vaccination, may lead to the child not being brought back on the correct date for their next scheduled vaccination, or the child not being brought back at all and thus not completing their basic series of recommended vaccinations. Either outcome results in the child being unnecessarily vulnerable to vaccine-preventable diseases.

Understanding and improving interactions between health workers and caregivers can lead to health workers gaining more satisfaction from their vaccination work, and caregivers feeling more satisfied and better informed, and therefore more children being fully vaccinated and protected (11).

Previous studies have shown that the use of routine childhood immunization in Ethiopia is dependent on four major factors: caregivers' behavior, family characteristics, information and communication, and immunization service system (12). Very few studies have evaluated the quality of health worker and caregiver interactions at health facilities during vaccination sessions in pastoralist and semi-pastoralist regions of Ethiopia. Accordingly, this study aims to contribute to this area of research by exploring the quality of health worker and caregiver interactions during vaccination sessions, and to identify gaps in communication, at health facilities in Benishangul-Gumuz region.

Methods

Study site: The study was conducted in the Benishangul-Gumuz region of Ethiopia. The region had a projected population of 1,065,334 in 2017, with the majority of people (96%) dependent on agriculture for their livelihoods. The region has two hospitals, 32 health centers and 361 health posts, and is subdivided into three administrative zones: Metekel, Assosa and Kemashi. The three zones are subdivided into 20 *woredas* (districts), which are further subdivided into *kebeles*, the smallest administrative units (13).

Study design: A qualitative cross-sectional method was employed to conduct the study. The research team carried out in-depth interviews of health workers providing vaccination in 12 health facilities. Health worker and caregiver interaction was observed, and caregivers were interviewed.

Sample size: The study areas were selected purposively based on vaccination service availability and geographical access. Six districts in the region, geographically representing central and remote areas, were selected purposively. The selected six districts were from Assosa and Metekel zones. In the selected districts, a list of hospitals, health centers and health posts was prepared. In each district, a health center and a health post were selected randomly from the list of health facilities. At each health facility, a health worker providing the vaccination service was selected for in-depth interview. On the day of the visit to the health facility, all caregivers who brought children for vaccination were included in the study. Interactions between health workers and caregivers were observed at all vaccination sessions. All caregivers were interviewed on their exit from vaccination sessions.

Methods of data collection: Primary data were collected by using semi-structured questionnaires for in-depth interviews of health workers, observing vaccination sessions, and exit interviews conducted with caregivers after vaccination sessions. The in-depth interviews of health workers were conducted to assess health workers' attitudes, their general levels of motivation regarding their immunization responsibilities, and decision-making on vaccinating a child. The exit interviews of caregivers after vaccination sessions were done to assess how well caregivers understand and remember what the health worker said, as well as caregivers' satisfaction with the service and information provided. Observations of interactions between the health worker and caregivers at health facilities were done to assess the practice and attitude of health workers during vaccination sessions. A detailed checklist of possible expectations was prepared, and the observer recorded each practice or attitude exhibited by the vaccinator. Interviews with health workers were conducted before the observation of vaccination sessions. We did not explain to interviewees the specific aspects being observed. We requested both the health worker and the caregiver to act as they normally do. The observer sat as far away as possible during interactions between health workers and caregivers, while still being able to hear, so as to avoid reacting either verbally or with body language. Through direct observation, we assessed if health workers give vaccinations to eligible children; health workers provide messages to caregivers; and health workers' decisions as to whether to give vaccines to children. Through exit interviews, we assessed caregivers' perceptions regarding how treatment was offered by health workers, and if such perceptions affect their decision to come back for the next vaccination, and information provided to them by health workers regarding the possible side effects of vaccination. One interviewer and one note taker conducted the in-depth interviews of health workers and audio-recorded them. We linked the observation of caregivers by the observer with caregivers' exit interviews conducted by the exit interviewer. Exit interviews with caregivers were conducted away from the vaccination site and out of sight of the health worker. The questionnaires were prepared in English and translated into Amharic. There was no need for translation to other languages. All the health workers spoke Amharic, and during the exit interviews,

caregivers had no problem responding to the questions in Amharic. Study data collectors had MPHs and/or PHDs, previous experience in qualitative data collection, and were fluent in speaking and writing Amharic. Data collectors were trained on the use of the study tools before deployment.

We observed vaccination activities in facilities over a one-week period. We adjusted the number of days based on the relative percentage of vaccinations given at each site and existing knowledge of where problems may be most serious. We observed many children being vaccinated, and we observed at least five interactions in a session to decrease the chance of health workers acting in ways that they believed the research team would want them to see.

Data management: Findings from in-depth interview audio-recordings were transcribed into Microsoft Word 2010 by data collectors fluent in Amharic, the region's official language. To ensure accuracy, transcribed documents were reviewed by investigators and compared with notes taken in the field. The transcribed text was translated into English. The investigators coded the translated transcripts utilizing focused coding based on the objectives of the study. The codes were then entered into qualitative data analysis software ATLAS.ti 8 by topic to explore both anticipated and emergent themes using a thematic analysis technique.

Ethical considerations

Ethical approval for the study was obtained from the research ethics committee of the Benishangul-Gumuz regional health bureau. Informed consent was obtained from each participant for the in-depth interviews, exit interviews and observations. Observation was conducted after obtaining informed consent from both health workers and caregivers.

Operational definition

In this study, 'high-quality interaction' was defined as clear and complete messages on key immunization messages, passed from the health worker to the caregiver, which the caregiver has understood fully. The following parameters were used to assess the quality of interaction: health worker giving clear and full information on the type of vaccine given, its side effects, return date for next vaccination, importance of the vaccination card, bringing the card when coming for vaccination, and the use of job aids by the health worker during communication with the caregiver.

Results

The study was conducted between 20-26 July 2019, and the findings from in-depth interviews, observation, and exit interviews were triangulated. The study enrolled and analyzed in-depth interviews with health workers in 12 selected health facilities in six districts. Most of the vaccinators at health centers were nurses, while health extension workers and nurses provided the vaccination service at health posts. Almost all health workers had various roles and tasks they are responsible for at the health facility, and vaccination was considered an 'additional other task' (see Table 1).

Table 1: **In-depth interviews: Profile of respondents at health facilities**

Zone	Facility	Profession	Sex	Years of service	Main role/task	Other roles/tasks
Assosa	Shebora HC	Nurse	M	2	EPI focal person	Vaccinator
	Gumba HC	Nurse	F	2	Vaccinator	MCH/Family planning
	Mengae HC	Nurse	M	1	Cold chain and vaccine management	Vaccinator
	Ura HP	HEW	F	11	Health extension package	Vaccinator
	Shebore HP	Nurse	M	2	Vaccinator	MCH/Family planning
	Kashaf HP	HEW	F	1	Health extension package	Vaccinator
Metekel	Bulen HC	Health Officer	M	2	EPI focal person	EPI coordinator
	Gallessa HP	HEW	F	2	Health extension package	Vaccinator
	Gallessa HC	Nurse	M	1	EPI focal person	Vaccinator
	Mambuk HP	HEW	F	2	Health extension package	Vaccinator
	Mambuk HC	Nurse	M	2	EPI focal person	Vaccinator
	Emanchi HP	HEW	F	3	Health extension package	Vaccinator

HC = health center; HP = health post; HEW = health extension worker; EPI = Extended Program on Immunization; MCH = maternal and child health

Over the course of the visits made by the research team, a total of 79 caregivers had their children vaccinated in 12 health facilities. All of the vaccination sessions were observed, and all caregivers were interviewed on exit from the vaccination session. All but one of the caretakers who brought a child to a health facility were mothers, the majority (44/79) were in the age group 25-35 years, and most (47/79) could not read or write (see Table 2).

Table 2: **Profile of caregivers who brought a child to a health facility for vaccination**

	Age			**Relation to child**		**Read and write**	
	15-24	25-35	36-49	Mother	Other	Yes	No
No.	25	44	10	78	1	47	32
%	32	56	13	99	1	59	41

Four themes and 14 sub-themes emerged during data analysis. A narrative account of the themes and sub-themes supported by direct quotes from participants is presented below.

Table 3: **Themes and sub-themes of quality of health worker and caregiver interaction during child vaccination sessions**

Themes	**Sub-themes**
1. Vaccinator and caregiver interaction at health facilities	- Vaccinators' opinion on interaction with caregivers during vaccination session - Caregivers' perception of interaction with vaccinator
2. Key immunization messages to caregivers by vaccinators	- Importance of immunization card - The return date for vaccination - The type of vaccine given for age - When it is safe to vaccinate a child - Side effects of vaccine and vaccination - Importance of completing vaccination
3. Factors affecting dependability of message from the vaccinator for immunization service	- Vaccine stock-out - Lack of transport services for vaccines - Malfunctioning refrigerators - Lack of job aids - Vaccination days
4. Communicating with caregivers through community volunteers	- Vaccination messages to caregivers given by community volunteers

Theme 1: Vaccinator and caregiver interaction at health facilities: All vaccinators at the health facilities described the work they do to get children vaccinated. Despite working in difficult circumstances, with insufficient support and a lack of vaccines and other essential commodities, vaccinators described their interaction with care givers during vaccination sessions as satisfying:

"I enjoy the work I do to vaccinate children; I consider my contribution for vaccination very important." Nurse and vaccinator, Assosa Zone

All vaccinators were observed to be friendly and polite to caregivers. All caregivers praised health workers' treatment during the service:

"The vaccinator treated me very well today and he treats me well whenever I bring my child for vaccination." Caregiver, Assosa Zone

Theme 2: Key immunization messages to caregivers by vaccinators: The importance of the child immunization card is one of the key immunization messages that vaccinators fail to explain to caregivers. The importance of the immunization card is not widely understood by caregivers, and some forget to bring the card with them when their child is brought for vaccination. Decisions made by vaccinators when caregivers forget to bring a child's immunization card are mixed. Some tell the caregivers to go back and bring the card, especially if they live nearby, and do not give vaccine to the child:

"When mothers forget to bring the immunization card, we do not give vaccine to the child, and ask the mother to go back and bring the card." Health extension worker, Metekel Zone

Others advise caregivers to bring the card when they next visit the facility, and only give the vaccine to the

child after checking the child's record in the immunization registration book at the facility:

"When mothers forget to bring the immunization card, I understand the situation. I ask her reasons, I search and find the child immunization history from the immunization registration book, then I record today's activity in the immunization registration book, and tell her to bring the card next time. If the card is lost, I provide her with a new one." EPI focal person and vaccinator, Assosa Zone

Caregivers do not know the return date for the next vaccination, although the return date is written on the vaccination card given by vaccinators to caregivers' before they exit the vaccination session. The return date written on the card was rarely complemented by verbal explanation from vaccinators to caregivers. Often, children are brought for vaccination after the date for their next scheduled vaccination has passed. In such circumstances, vaccinators give children their next scheduled vaccine:

"When caregivers bring their children after the due date for vaccination has passed, I do not have bad feelings towards the caregiver. I ask them their reasons; I ask why they did not bring the child on the return date for vaccination; advise them that vaccine should be taken on the date specified and not to be late again; and then give the vaccine to the child." Health extension worker, Metekel Zone

Vaccinators do not always tell caregivers the type of vaccine the child will receive at vaccination sessions. Caregivers interviewed on exit from their vaccination session refer to the vaccine given by the site of injection and route of administration, and not by name and purpose. They agree to any vaccine recommended by the health worker and are willing to allow their child to be vaccinated. Caregivers believe health workers know best, and believe vaccines to be important to prevent illness:

"I always bring my child for vaccination, whenever I am told to do so, to get the child vaccinated." Caregiver, Assosa Zone

A sick child is commonly mentioned as a contraindication for vaccination by health workers. Contraindication for vaccination is qualified by some to mean every sick child, irrespective of the degree of illness, and by others to refer to only those children who are seriously sick.

Children aged one year and below are the target group for routine immunization, and vaccinators consider the first nine months of age to be the end of routine immunization. They provide certificates of completion in relation to children who have completed the immunization schedule at 9 months of age, and congratulate caregivers. At the same time, they also tell caregivers to bring their child back for their second dose of measles vaccine (MCV2) at 15 months.

The general symptoms of fever and pain at injection sites are the two most common vaccine side effects mentioned by health workers to caregivers:

"The vaccinator told me that the child might develop fever or/and pain after the vaccination. He advised me to treat fever with cold water compress and apply hot water compress on the injection site if painful." Caregiver, Metekel Zone

Theme 3: Factors affecting dependability of messages from the vaccinator for immunization service: Vaccination is scheduled twice weekly at health centers and weekly at health posts, and BCG and measles vaccines are scheduled monthly. Accordingly, vaccinators give appointments for vaccination. However, there are instances where they are not able to provide vaccination because vaccines are out of stock or because there is a shortage of transport to bring vaccines from the health center. Other factors contributing to cancelling the vaccination schedule include facility decisions to offer vaccines on fewer days to avoid vaccine wastage. All health centers have outreach sites, at which communities are told about vaccination days. One health worker remarked:

"The health post's refrigerator is out of order and depends on the health center, which is 5 kilometers away, to keep vaccines. We have a shortage of transport to bring vaccines from the health center and to conduct outreach immunization sessions. We do not carry out immunization activities regularly." Health extension worker, Metekel Zone.

In all the health facilities, health workers seldomly praised caregivers for bringing their children for vaccination, and in their discussions with caregivers, did not use job aids to explain vaccination messages. All vaccinators refrained from asking caregivers for money or in kind.

Theme 4: Communicating with caregivers through community volunteers: Health workers work with community volunteers to reach caregivers at home with immunization messages. Community volunteers give health workers lists of children eligible for vaccination and the family members they have communicated with regarding vaccination. The health facilities collaborate with the community volunteers to pass on immunization messages to the families and community, to help trace defaulters, to identify pregnant mothers, and to notify them of newborns who require vaccination. Health workers consider the contribution of community volunteers as one of the most important factors for ensuring successful vaccination programs.

Discussion

Health workers in Benishangul-Gumuz region were observed to be, and described by caregivers as, friendly and committed to vaccinating children. This is a very positive and encouraging finding, and a departure from the finding of other studies (14-18), which suggest that health workers' attitude is a major hindrance to

caregivers' uptake of immunization services. Bad experiences may affect caregivers' willingness to vaccinate subsequent children, and caregivers may discuss their negative experiences with others in the community, which further hinders community members from bringing their children to vaccination sessions. This is also reflected in demographic and health survey data, which shows higher birth order children tend to receive fewer vaccinations (9).

In most cases, the return date for the next vaccination is written on the vaccination card. However, caregivers often did not mention the return date as written on the vaccination card. Vaccinators do not always verbally communicate the return date to caregivers, and even when they do, they do not invite questions or confirm that the return date is correctly understood by the caregiver. This finding is in agreement with a previous study conducted in Wonago, Ethiopia (19).

Vaccinators did not always tell caregivers about the content and purpose of the child's vaccination card. The high level of illiteracy among caregivers hinders comprehension of what is written on the immunization card and hence, understanding of importance of the immunization card. Caregivers do not always bring vaccination cards to the health facility, either because they do not realize that they are required to do so, or because the cards have been lost. When a caregiver did not bring the child immunization card with them, the vaccinator did not always give the vaccine to the child until the caregiver had gone back home and returned with the card. This situation could be avoided if the contents and purpose of the immunization card are clearly and regularly communicated to caregivers.

Caregivers did not know the specific vaccine that was administered to their child, either because they could not read the name of the vaccine given in the vaccination card or were not told by the vaccinator the type of vaccine given. This, however, does not seem to hinder vaccine uptake, as most caregivers believe that vaccines are good for their children. Similar findings are seen from studies in The Gambia (20) and Rwanda (21).

The second dose of measles-containing vaccine (MCV2) was added to the national immunization schedule in 2019. MCV2 is given at 15 months, 6 months after the first dose (MCV1). Vaccination completion certificates are given at 9 months of age, despite the primary vaccination schedule continuing up to the age of 15 months for MCV2. Awarding certificates of completion should be aligned with completion of the primary vaccination series, when caregivers return for MCV2.

BCG and MCV vaccines are often provided on a monthly basis, which require the caregivers to come back on a separate date to get the service. In situations where caregivers cannot return on the specified date, the child could miss the vaccine (11).

Vaccinators usually communicate with caregivers about fever and pain at the injection site to be possible side effects from the vaccine the child has received. However, the information given about side effects is not specific to the type of vaccine the child receives, and misses important common injection-related side effects, such as redness, itching, swelling or small nodules that might persist at the injection site. A caregiver who does not have previous experience could be alarmed if side effects that the health worker failed to mention occur, and could be a reason to keep their child from returning for further vaccinations.

Contraindications for giving vaccines in some facilities include any sick child. This could be because of fear that health workers might be blamed if an illness gets worse after vaccination (10). This could result in a child missing life-saving vaccination.Vaccine shortages on designated days of vaccination sends a negative message to caregivers about the future availability of the vaccination service, and hence could deter caregivers from seeking vaccination for their children. Equally, the inefficiency of the cold chain system could potentially impact on antigen potency. All health workers do not use job aids, which has a negative impact on the scope and depth of information shared with the caregiver.

Community volunteers contribute hugely to the success of immunization programs. Involving community volunteers in vaccination programs has been documented as an important aspect for their success (22).

Conclusions

Although health workers are friendly and appreciated by caregivers, key and full information that will ensure caregivers continue to use the vaccination service is not communicated to caregivers. To ensure continued use of the immunization service at health facilities, the gap in health worker and caregiver communication needs to be improved by training health workers in interpersonal communication (IPC) skills, immunization in practice, and standardized communication competency guides.

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