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Research Article

Mothers' Opinion About the Quality of New-Born Health Services: Implementation Research in Nampula, Mozambique

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Abstract

Background: New-born mortality is high in Africa, including in Mozambique (67.3 deaths of children less than one year of age per 1000 live births, 2017). One important factor to reduce this public health burden is ensuring the frequency and quality of new-born visits, with the availability of effectively and timely patient centred care. To reduce the new-born mortality rate in Natikiri, Nampula, teams of researchers from Lúrio University, Mozambique and the University of Saskatchewan, Canada, carried out implementation research, Alert Community for a Prepared Hospital care continuum, which included training programs for health professionals in maternal and child health care as a central component. We planned a mid-project evaluation, to assess the impact of these trainings on the quality of new-born care services at Marrere Health Centre.

Methods: This was a quantitative study, applying two cross-sectional surveys about new-born visits quality at the Marrere Health Centre in Natikiri district, on the outskirts of Nampula city in Nampula province, northern Mozambique. The first survey was conducted after two health professional training sessions and the other after five more sessions. The samples of carers of infants up to 28 days of age were surveyed at the Healthy Child Service, Child at Risk Service and Emergency Room, and were calculated considering the average number of post-partum visits per month, 47 in 2018, using a margin of error of 10% and a confidence interval of 90%, and 134 in 2019, using a margin of error of 5% and a confidence interval of 95%. The surveys included a wide variety of user opinion measures of quality and used a five-point Likert scale; the responses were coded and entered *REDCap* digital database, and analysed to assess frequencies, percentages, mean and standard deviations. This research was approved by the bioethics committees at both Lúrio University and at the University of Saskatchewan.

Results: 188 mothers were surveyed at Marrere Health Centre, about the quality of new-born services they had just received. Most areas of childcare services showed no improvement with the trainings. Positive improvements were a 48% increase in health professionals encouraging mothers to share any difficulties during the visit, and a 31% increase in encouraging mothers to have a person of their choice to accompany them during labour, almost always suggesting a traditional birth attendant (97%). Many

shortcomings persisted in practices of introducing themselves, communication with patients, privacy, and confidentiality.

Conclusion: The quality of care at Marrere Health Centre' new-born health services did not improve after an earnest attempt at building capacity of the health professionals in the hope of improving practice. We learned that they fell short of practising according to Ministry of Health protocol and did not adopt the key training messages, which had been reinforced through role playing. Reviewing the learning approaches and developing a program of continuous capacity building would be the next steps to further try to improve quality of new-born care.

Keywords: Child health; Health services; Implementation research; Mozambique; New-born; Patient centred care; Quality assessment

Background

Child mortality has its highest incidence in the first year of life and is concentrated in the first month [1]. Access to and quality of child health services is essential to achieve Sustainable Development Goal 3, [2] especially in low-income countries, including reduction of morbidity and mortality rates in children, which in Mozambique are among the highest in Africa and the world. To reduce new-born mortality the World Health Organisation (WHO), produced in 2016 specific recommendations for countries to follow [3].

In 2008, the Mozambican Ministry of Health (MISAU) developed a strategy to accelerate maternal and new-born mortality rates reduction, [4] but in 2013, the country registered 27.8 deaths of children less than 28 days of age per 1000 live births, and 88.5 under five years, [5] with higher mortality risk for those born in Nampula and other northern provinces [6]. Though the child mortality rate has decreased in Mozambique in the last three decades, [7] it is still high (67.3 deaths of children less than one year of age per 1000 live births, 2017) [8].

Among the main causes are the low number of qualified health professionals (HPs), and the lack of equipment and supplies. Additionally, are poor quality of care, deficient referral system, long distances, and lack of transport to access the health unit (HU), poor communication between HPs and the community, gender, and traditional issues. These barriers are common to low-and-middle income countries, [9] mainly in sub-Saharan Africa [10,11]

Although MISAU defined policies to promote child health in primary care at Healthy and at Risk Children Services since 2011, [12] in the last decade, the already low quality of maternal and child health (MCH) services in Mozambique has hardly improved [13]. An assessment of quality and access to health care in 195 countries in 2016, placed Mozambique in position 179 [14].

These facts led the Faculty of Health Sciences (FHS) of Lúrio University (UniLúrio in Nampula) and the University of Saskatchewan (in Saskatoon, Canada) to develop implementation research on MCH, in Natikiri district, a peri-urban area of Nampula city, capital of Nampula province, northern Mozambique, called Alert Community to a Prepared Hospital care continuum (ACPH). A community baseline study carried out in 2016 with large community participation, showed a low level of knowledge about sexual and reproductive health (SRH) and rights in Natikiri, and poor family planning (FP) practice [15].

Knowing that most new-born deaths can be prevented by effective interventions, [16] project activities stimulated community participation in health services, and SRH and FP education, empowering the population with health knowledge and motivation in the hope of positively impacting on attitudes and practice. Another key strategy was to improve training of HPs in obstetric emergencies, new-born resuscitation, SRH rights, ante-natal consultation, and humanization of care in Marrere Health Centre (MHC) and Marrere General Hospital (MGH); and some equipment and supplies were provided.

Our aim with this study was not an assessment of the overall training strategy of the implementation research project ACPH, since we do not have data before the intervention; but it pertains to the results of a planned mid-project evaluation, intended to estimate the impact of HPs training in new-born visits, which have previously been demonstrated to have a positive effect on the quality of services [17].

Given the importance of feedback from users to evaluate health services, with regards to the quality-of-care issues, communication, information and advice, our implementation research method promoted such practices also targeting participants' citizenship and health empowerment, informing, and educating them at the same time.

Methods

Study design

This was a quantitative pre-post study, applying two cross-sectional surveys on user's opinion about the quality of new-born care services, the first being conducted after two HPs' training sessions on new-born resuscitation using the "Helping Babies Breath" program (2018) and the second after five more training sessions, two on new-born resuscitation, two on family-friendly consultation and humanized care, and one in SRH (2019). Each training lasted five days, 20 hours in total, using lecture, practical

demonstration and role playing, given to 30 HPs (22 female) over the seven modules, each with an average number of 15 participants.

Setting

Surveys with volunteer randomly selected mothers were carried out at the Healthy Child Service, Child at Risk Service and Emergency Room, in MHC, at Natikiri district, Nampula, Mozambique (close to Nampula city).

Sample

To calculate representative samples of mothers with children with less than one month of age we used Survey Monkey sample size calculator, considering the monthly average number of previous year post-partum visits, 143 in 2018, with a margin of error of 10% and a confidence interval of 90%, thereby attaining 47 women. For the second survey, considering 178 (2019) post-partum visits per month, with a margin of error of 5% and a confidence interval of 95%, thereby attaining 122 women, and we added 10% to this group to compensate for registration issues, attaining a final sample of 134 mothers.

The two groups are made up of different participants and there were no refusals, abandons or repeated surveys.

Data collection

Participants undertook a previously tested survey, to evaluate validity and feasibility, with 10 mothers of children less than one month of age at the close by *25 de Setembro* health centre, when one adjustment was made adding "faces" expressing opinion about principles of good care, communication with the mother, privacy and confidentiality, care during labour and with the new-born and FP. The questionnaire was designed by the research team, following WHO recommendations [18] and adopting MISAU recommendations. It was administered in Portuguese or Emakhuwa (the local language) according to the participant's preference, during around 30 minutes, by UniLúrio FHS students, adequately trained and signing ethical and scientific commitment forms, and unknown from participants. Mothers of new-born children were questioned in private at the MHC facilities from the 24th to 31st of July 2018 and from the 28th of November to 6th of December 2019. All women were informed they were free to participate voluntarily, or abandon the survey if they wanted, without any consequences in access or quality of care, received written information about research objectives and methods, risks and benefits, and signed an informed consent form, including an informed assent term for adolescents under the age of 18 years.

The survey had 28 closed questions, with multiple choice answers, responded using a 5-point Likert scale (i.e. totally agree, agree, indifferent, disagree, strongly disagree); and three in depth open-ended questions: best service, least pleasant, needs to do. Data collection instruments were evaluated on the quality of completion.

Data analysis

All the data from the questionnaires were introduced into *REDCap* (Research Electronic Data Capture) at, by the same students, accompanied by a FHS lecturer who was consulted as needed. The data were then analysed by a statistics professor to calculate frequency, percentage, average and standard deviation of each of the variables.

This study was approved by the Institutional Committee on Bioethics for Health at UniLúrio (02/CBISUL/16) and the Bioethics Committee at the University of Saskatchewan (BEH#15-112) and followed all Helsinki Declaration (2013) guidelines.

Results

We surveyed 188 women with children less than one month of age at the MHC Healthy Child Service, the Child at Risk Service, and the Emergency Department (48 after two HP trainings; 140 after a total of seven training sessions), with a mean age of 23.4 years (standard deviation 5.8), minimum 14 and maximum 45 years (4.9% with less than 18 and 4.1% with more than 35 years). Concerning educational attainment, 34.3% were illiterate, 49.3% had completed primary and 15% secondary, and two (1.4%) with higher education. The participants' characteristics are detailed in [Table 1].

			2018 (n = 48)	2019 (n = 140)	
No.	**Question**	**Answer**	**Post 2 trainings**	**Post 5 trainings**	*Progress (%)*
1	Residence (%)	Natikiri	83	99.3	20
		Other	17	0.7	-96
2	Number of previous pregnancies	Average (n)	2.6	2.96	14
		< = 3 (%)	75	67.9	-9
3	Number of hospital deliveries	Average (n)	2.3	2.28	18
4	Home births	(%)	6	24.3	305

5	Miscarriages	No (%)	83	88.6	7
		Yes (%)	17	11.4	-33

Table 1: Participants' characteristics.

We then compare their responses between the first and second survey. The proportions of residence locations changed, with an increase in women from the nearby Natikiri neighbourhood; there was a slight increase in the number of previous pregnancies and the percentage of home deliveries increased fourfold; there was no change in the percentage of women acknowledging a miscarriage (spontaneous or provoked).

The assessment of principles of good care, although confirmed by more than half the participants in most questions, shows a negative evolution in all areas, including reception, communication with patients, privacy and confidentiality, care during labour, and childcare.

Patients felt less (-10%) welcome at the services, HPs did not greet them and offer a seat (-30%), asked less about their name (-25%), if they had any doubts (-42%), did not encourage them to ask questions (-27%) and state their expectations at the beginning of the consultation (-49%). Fewer HPs explained what they would do before performing a physical examination or other interventions (-13%) and encouraged the husband's participation on caring for the new-born (-28%).

However, some positive points were identified about improved care during labour: they informed more (48%) of the mothers that they had the right to speak to any HP about their difficulties, they were given the option to have a person of their choice to accompany them during labour (31%), notably a traditional birth attendant (TBA) (97%), and more were told they could deliver in a position of their choice (89%).

The last survey question summarized the findings of participants' perceptions, asking them how they would evaluate their overall care experience. Most rated their experience as excellent (34%) and good (58%), but the evolution of this service, however, was unfavourable for some with a 10% increase of unsatisfied users see [Table 2]. In answers to the open questions about what they like in childcare services, the percentage of carers well satisfied with the quality of care decreased (-12,1%), but we saw that 90 users (64.8%) liked the HPs reception and care. What they did not like, though, about the service was an increase in criticism about attendance (19.6%), and 31 users (22.4%) refer to HPs bad performance including illicit charges, and 5 (3.6%) lack of medicines (a frequent problem in the national health services).

Asked about what they would change to make the service better, we had a reduction of 29.3% of those who would do nothing, 32 (23.2%) suggested improving the reception of patients by HPs, improving HPs punctuality and eliminate illicit charges, and 6 (4.3%) wanted improvement in the availability of medication.

		2018 (n = 48)	**2019 (n = 140)**	
Question	**Response (%)**	**Post 2 trainings**	**Post 7 trainings**	**Change (%)**
How do you evaluate your experience at new-born care visit at Marrere Health Centre?	Great	20.8	3.6	-38,4
	Good	70.8	49.6	
	Not very satisfied	2.1	12.4	+10,5
	Not satisfied	4.2	4.4	

Table 2: Users' opinions about child health services quality at Marrere Health Centre.

Discussion

Most participants live in the three communal units of Natikiri neighbourhoods (Marrere, Natikiri, Murrapaniua), with an increasing trend over time as fewer were coming from further away. They have low education levels, with strong traditional and religious determinants, making health preventive attitudes rare in this population: what happens to the person, good or bad, does not depend on your behaviour, but upon spiritual beliefs.

The mean number of pregnancies per women (3) remains under the national average (5.2), with more than half having three or less pregnancies, probably due to the low group mean age and to the strong social media campaign promoting FP in the last few years and as part of our implementation research project. Home births increased, perhaps due to the women feeling more at ease to reveal it or due to a declining perception and reputation of the facility-based services, as indicated by our survey results, leading to a conclusion of poorer care; the apparent contradiction with the fact that the carers, when asked about their overall experience, respond the services did fairly well, might be explained by the low school level of these users, decreasing service quality expectations.

Miscarriages (spontaneous and provoked) showed no change, but we know this is a culturally sensitive issue in this population, where traditional animist religion target reproduction as one of its main objectives.

As recommended by the WHO and MISAU, the women reported that HPs informed delivering women that they had the

option to have a person of their choice accompany them during labour, making them feel more relaxed and compensating the low number of staff. This is a low-cost and effective intervention to improve the quality of MCH care [19].

In 2019, most mothers at MHC Healthy Children and Children at Risk consultation services, were satisfied with the attendance, but we note a more critical and negative evaluation, that might reflect user's empowerment following health education.

Although more than half of the participants refer that HPs are practising the principle of good care, they were found to be not systematically proceeding according to the MISAU policy and MCH protocol. They have deficiencies in patient reception, providing information, communication, and in matters of confidentiality. Lack of medicines also remains a challenge, as recognised in other low-income countries [20,21]. Nevertheless, this poor service remains acceptable in the women's overall perception, probably due to their low expectations and a reluctance to offer criticism of the care givers at the institution.

HPs respectful and appropriate attitudes towards child carers, and their knowledge and education, are essential to ensure the quality of child health services. It is also recognised that maternal care directly impacts in new-born outcomes [22].

Our evaluation of HPs' training for new-born care services revealed no significant impact on childcare quality at MHC. This finding might be related to the high turnover and reduction of MHC professionals (a 50% reduction of MCH staff from 2017 to 2019), their reduction causing an overload of work in those remaining. And the constant lack of material resources due to financial shortcomings likely contributed a work environment negatively affecting HPs' attitudes, motivation, and performance of the six evaluated training sessions, we had 24% participants missing in the post-test and mean evaluation of self-reported progress was weak (13%), likely mainly due to frequent absences during the training sessions caused by the need to attend to routine tasks.

However, childcare indicators show a general positive increase in number of children served over time (39%), high above the population increase rate (2,8% per year), despite the lack of MCH professionals see (Table 3), which likely further led to work overload and decline in service quality. Nutritional monitoring, a fundamental strategy for approaching malnutrition among Mozambican children, also showed a marked decrease (-63%).

This is disappointing as nutritional screening is an easily understood and excellent tool for dealing with malnutrition. Subsequent recommendations for MHC MCH professionals were transmitted verbally to them and discussed in follow-up meetings, and then written in a report delivered to the MHC Director and all MCH HPs. Nevertheless, we have demonstrated that our HP training in MCH alone was not effective to increase the quality of childcare services, needing better working conditions, stability, and salaries to improve their productivity.

Area	Service	2016	2017	2018	2019	Progress % 2016 - 2019
Post-partum visit	Consultations	1536	1791	1711	2139	39
Child health	Children < 1-year visits	1132	817	878	4466	295
	Nutritional monitoring children < 1 year	1132	817	1368	422	-63
	Vaccination BCG	1412	1710	1872	2040	44

Table 3: Evolution of child health services indicators at Marrere Health Centre, 2016 – 2019; Data collected from Marrere Health Centre yearly activity reports.

Facility and human resource assessment tools are valuable to evaluate the quality of new-born care and guide priority interventions to reduce the burden of child morbidity and mortality, [23] but it is also necessary to strength health system data collection methods [24].

We recommend a national MCH HPs training campaign, continuous [25] and regular, targeting clinical skills, health care principles and values, transforming attitudes, and interpersonal communication. This must be combined with an improvement of working conditions, all of which can contribute to the building of a stronger organization culture and adherence to a mission which takes into consideration the needs of both carers and those being cared for. Those needs have been identified by MISAU since 2009 [26] and are developed in the Global Strategy for Women's, Children's, and Adolescents' Health (2016-2039) [27].

Study limitations

The first potential limitation we point out is the lack of the questionnaire psychometric testing. Second, the location of surveys at MHC might have influenced some answers, due to the institutional environment, which can be intimidating to rural populations. Another issue is the application of the Likert scale to a population with perceived difficulty in abstract conceptualization, in which the terms totally and partially may have been not well

understood. Another limiting factor in comparing the two surveys is the use of a 90% confidence interval and 10% margin of error in the first sample, which was different from the second (95% and 5% respectively). Overall, the high internal (among different services) and external (moved to other health facilities) staff rotation which we experienced during the time of the study likely diminished the impact of the training on HPs performance.

Conclusions

Health systems everywhere face new (antimicrobial resistance, climate emergency, Covid-19 pandemic) and old (financial, human resources, traditional taboos concerning new-born infants) challenges, and need to develop new intervention methods to deal with them, hopefully by evidence-based persuasion. This is particularly the case in Mozambique and in Nampula province.

The HPs in our study have heavy workloads, and they do not systematically practice according to protocol, having several shortcomings in patient reception, information, confidentiality, respect, and communication.

Although most users were satisfied with the care provided, and the child health statistical indicators show improvement in the number of post-partum consultations with children less than one month and less than one year (39,3%), child mortality remains high, mainly due to the persistence of home deliveries, revealed by 7,4% increase in the number of children in post-partum visits compared to the number of maternity deliveries.

The Mozambican national health system, considering its challenges, with scarcity of HPs and low funding, continually looks for new tools for improvement. Sustained health sector investment in capacity building, such as HPs training and better working conditions, and functional stability essential to professional development, are keys to achieve behaviour change, and better quality of child health services.

These interventions depend on MISAU innovation, investment, and leadership to:

1. Ensure the required number and continuity of MCH HPs at all HUs.
2. Better HPs working conditions, including supervision and overall management.
3. Provide the necessary supplies for properly functioning services, including medicines, gloves, masks, and health information and education materials.
4. Promote recurrent training of MCH HPs, with good learning conditions and methods, providing periodic reinforcement and updating, in new-born care, humanized consultation, and patient centred and family friendly services.
5. Maintaining a population health information campaign, targeting risk perception and preventive attitudes and behaviours, using local languages, and promoting health facility services over traditional health practitioners, though together with them.

What is already known on this topic

- New-born mortality is high in Mozambique, and an important cause is low quality of health unit childcare services.
- Health professional training is believed to improve quality of care services.

What this study adds

- Health professional training in maternal and child health alone is not effective to increase the quality of childcare services.
- Health professionals need better working conditions, stability, and salaries to improve their productivity.

Conflicts of interest

The authors declare they have no conflicts of interest with study design or final report, no financial or personal relationships with other people or organizations that could inappropriately influence this research.

Authors contributions

PP: Study protocol conception and design, data analysis and interpretation, article draft, final approval of the version to be published.

MM: Study protocol design, data treatment, analysis and interpretation, final approval of the version to be published.

JM: Study protocol design, data interpretation, article draft, final approval of the version to be published.

DZ: Study protocol design, data interpretation, article draft, final approval of the version to be published.

RS: Study protocol conception and design, data interpretation, article draft, final approval of the version to be published.

CB: Study protocol conception and design, data interpretation, article draft, final approval of the version to be published.

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