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Maternal and Child Health Implementation Research in Mozambique: Effective community interventions to promote sexual and reproductive health

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Highpoints

- Community health workers are strong positive agents to better population' sexual and reproductive health and rights.
- Communities' participation in health system units' management promotes quality of care.
- Local communities' health empowerment is an efficient tool to better population' health.

ABSTRACT

Background: High maternal and neonatal mortality rates in Mozambique, are due to adolescent pregnancies, difficulties in accessing health services, traditional constraints, and gender inequalities. An implementation research project, Alert Community to Prepared Hospital in Natikiri, Nampula, Mozambique was developed to reduce maternal and newborn mortality. From 2016 to 2020, it implemented activities to improve population knowledge and function in sexual and reproductive health, and to enable community participation in maternal health services. In this paper, we assessed and discussed the impact of community participation on improving sexual and reproductive health.

Methods: The "Alert Community to Prepared Hospital" was an implementation research program with community intervention and programmed mid-term evaluations. It used mixed methods research design such as: with descriptive quantitative surveys, qualitative focus groups discussions and interviews, applied from 2017 to 2020. Local health committees, traditional birth attendants, traditional healers, and local leaders all participated: trained in sexual and reproductive health and participated in radio

discussion groups; community and hospital members of the co-management committee enabled local programming. Maternal and child health indicators were evaluated with the health unit's statistical operational data. Quantitative data were captured in Microsoft Office Excel, analysed with SPSS21 to find the frequency, percentage, mean and standard deviation; qualitative data were registered in Microsoft Office Word and analysed with Nvivo software. This research received bioethical approvals from both the Mozambican and Canadian universities and followed all Helsinki Declaration recommendations.

Results: Comparing changes from 2016 to 2019, the number of health committees operating in Natikiri rose from 7 to 20. Each committee integrated four Family Health Champions, who attained 24738 residents with health education interventions on reproductive health and rights. A theatre group developed dramas about the same key messages and presented the plays in local communities. Population access to contraceptives was facilitated, from 42% to 91% in women and from 65% to 90% in men. At Marrere Health Centre, women with four ante-natal visits rose by 185%, and children less than one year of age' surveillance visits raised by 89%; at Marrere General Hospital' maternity deliveries rose 60%.

Conclusion: Community participation, at all levels of maternal and child health service care continuum, from families, health committees, and communities to health centres and hospitals, enhanced with complementary interventions well contextualized, sexual, and reproductive health and rights key messages broadcasted and discussed, and presented by local theatre group, are effective in improving adolescent and adult sexual and reproductive health.

Plain English summary

Alert Community to a Prepared Hospital implementation research project was carried out in Natikiri, Nampula, Mozambique, from 2016 to 2020, aiming to reduce maternal and neonatal mortality rates, considered priority public health problem in this country. It deployed activities to improve population knowledge and behaviour in sexual and reproductive health and rights and enable community participation in maternal and newborn health services: classroom training, community radio discussion groups, and drama performances.

Using mixed methods research to evaluate results with local health committees, traditional birth attendants, traditional healers, and local leadership we compared maternal and child health indicators evolution at health units.

Comparing changes from 2016 to 2019, the number of local health committees rose, attaining 24738 residents with health education interventions, population access to contraceptives was facilitated, from 42% to 91% in women and from 65% to 90% in men, women with four ante-natal visits rose by 185%, children less than one year of age' surveillance visits rose 89% and Hospital' maternity deliveries by 60%. Community participation at maternal and child health service care demonstrated to be effective in improving adolescent and adult sexual and reproductive health.

Trial registration

This study was approved by the Lúrio University Bioethics Committee (02/CBISUL/16) and the Behavioural Ethics Board at the University of Saskatchewan (BEH#15-112), and was not registered in any database.

Keywords: child health, community, family planning, health services, implementation research, maternal health, Mozambique, participation, pregnancy, reproductive and sexual health.

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Introduction

Mozambique has high maternal mortality rates (452/100000 live births, 2017) and child mortality (67.3/1000 live births) (1). Those are due to a variety of factors: adolescent pregnancies, a high fertility rate, low family planning (FP) practice, insufficient numbers of qualified health professionals (HPs), lack of medical equipment and materials, a poor referral system, difficulties in accessing health services (transportation, long waiting times, and illicit charges), traditional religious constraints and societally embedded gender inequalities (2,3).

A participatory implementation research project (4), Alert Community to Prepared Hospital care continuum (ACPH), in Natikiri, Nampula, Mozambique, was developed to reduce maternal and new-born mortality and was subsequently implemented, funded by the International Development Research Centre (IDRC) in Ottawa with support from the Canadian Institutes of Health Research and Global Affairs Canada. It took place from 2016 to 2020, including research teams from Lúrio University (UniLúrio), in Nampula, Mozambique, and the University of Saskatchewan, in Saskatoon, Canada.

A baseline study was conducted in 2016, with large community consultation, including Local Health Committees (LHCs) and other community-based organization members, traditional birth attendants (TBAs), traditional healers (THs), and local leadership, with a simple question: "why are pregnant women and new-borns dying in your community?". (5) Some of the most common answers were complaints about HP's misbehaviour, including illicit charges. The complaint process was unusable at the hospital: community members informed that complaints did not have any impact, and never led to any changes in service delivery. LHCs in Natikiri were mostly inactive, and the hospital co-management committee (CMC) only met occasionally with a few participants.

Several strategies were designed to improve population empowerment in sexual and reproductive health (SRH) and rights, and to enhance access and enable community participation in maternal and child health

(MCH) services management, an efficient proven strategy to better health services quality, (6) at Marrere Health Centre (MHC) and Marrere General Hospital (MGH), the health units (HUs) serving the Natikiri population (over 56000).

We based all our objectives on the Ministry of Health (MISAU) defined strategies, programs, and tools, and worked in close partnership with the community. MISAU targets illicit charges ("petty" / administrative, bribery, favouritism) (7), and the issue of difficult access to health care in three ways:

1. Development of LHCs, to inform, educate and discuss with community members, regarding health issues.
2. Development of health centres and hospitals' CMCs, gathering HPs and members of LHCs to discuss, inform and cooperate on questions of facility management and provision of health care services.
3. Development of the HUs challenges survey tool (8), using a community and hospital-based report, and meetings to monitor and evaluate hospital function and user satisfaction.

MISAU has designed an effective community participation program, widely known to help increase the quality of public health services (9), but this strategy is rarely applied in the field.

To proceed with interventions, we established several partnerships: with MISAU, Nampula Provincial Health Directorate, Nampula City Health Directorate; and several non-governmental organizations, working on health issues in the area.

In this paper, we assessed and discuss the impact of our community participation interventions and alliances, on improving SRH, FP, and child health in rural northern Mozambique.

Materials and methods

This study aimed to assess and discuss the impact of community participation and empowerment in MCH, to improve SRH, access, and the quality of MCH care services in Nampula, Mozambique.

Design

This research applied community interventions and programmed mid-term evaluations, using mixed methods research to collect data, with quantitative documental review and descriptive cross-sectional surveys, and qualitative focus groups discussions and interviews, applied from 2017 to 2020 in Natikiri.

Interventions

To achieve behaviour changes, between 2017 and 2019, we applied a mass media campaign (10), with weekly radio broadcasts and community discussion groups, with monthly theatre performances, and with semestrial training on SRH, FP, child health, nutrition, community service, held in the local language (Emakhuwa), with all community groups, as recommended in other studies (11), together with interventions at HUs (we performed 11 HPs training and provided ante-natal visits and maternity equipment and consumables). The interventions were monitored by pre- and post-intervention surveys, focus group discussions, and documentary data collection.

We revived and trained other LHCs that have been inactive for several years, promoting their participation in MGH CMC meetings. Each LHC selected and trained "family health champions", two adolescents and two adults of both genders, to visit families with key health education messages, a recognized tool to better mother's health (12).

A theatre group was formed and created four original short dramas about the same key messages, and subsequently presented them twice monthly in different communities.

Radio discussion groups debated newly developed and diffused SRH weekly broadcasts on radio stations, using the local language, an efficient strategy applied in other countries in Africa (13).

TBAs, after training, mentored and followed pregnant women through to

maternity delivery and new-born visits. A newly developed local transport system was implemented to take women (and other emergencies) to the maternity at MGH. Six motorcycle ambulances were specifically designed and manufactured, and then were deployed and placed in geographically strategic communities' LHCs, covering a total of 18 Natikiri communities. Drivers were licensed and trained in basic first aid and public service, and community-based keepers were selected and trained.

The members of MGH CMC took a leading interest, meeting every two months to review complaints, enabling all aspects of local programming, and voluntarily participating in information and education programs. We facilitated MGH as the first hospital in Mozambique to systematically use the HUs Challenges Survey tool, by the CMC in regular bi-monthly meetings, monitoring health services evolution and communities' opinions.

This was part of creating a 'prepared hospital' but more so, various specific interventions were directed to the hospital, including the construction of a new surgical suite for caesarean sections, other equipment including two ultrasound machines and other supplies, and much provider training through workshops which were all evaluated.

Data collection

The surveys were carried out regularly, in the catchment area of MGH and MHC (both adjacent to UniLúrio), by UniLúrio Faculty of Health Sciences (FHS)' students duly trained, to identify, assess and track changes in relevant community knowledge, attitudes, and behaviours about SRH, FP and child health.

Periodic focus group discussions with each major stakeholder group were conducted to explore intervention barriers and successes. Monthly traditional birth attendant reports and motorcycle ambulances activities were tallied and assessed. Furthermore, to assess the acceptability, appropriateness, and feasibility of the implementation strategies, we carried out in-depth telephone interviews with community members, including adolescent and adult men and women. Data from MGH and MHC statistics departments were collected periodically.

Data analysis

Quantitative data were captured in Microsoft Office Excel and analysed with SPSS21, using frequency, percentage, mean, standard deviation.

MCH indicators were evaluated along with hospital and health centre operational data as was the implementation of the project's key messages.

Qualitative data were recorded and transcribed, before being analysed with NVIVO software using a content analysis approach.

Bioethics

Before implementation, this research received bioethical approvals from both Mozambique and Canadian universities. All participants signed or recorded an informed consent term. The study followed all Helsinki Declaration (2013) recommendations.

Results

Much data was collected and introduced in a digital database (https://rev.unilurio.ac.mz/umestumafam/redcap) and assessed comparing changes from 2016 to 2019.

The number of LHCs actively operating in Natikiri rose to over 95% of communities and target population; LHCs members attained to more than 10,000 persons per year with health information and education activities. Each LHC selected and integrated four Family Health Champions (both genders, two adolescents, and two adults), and managed to attain 3008 health education interventions with 24738

residents, sharing and discussing SRH key messages in the local language.

The theatre group presented the dramas about the same key messages twice monthly in different communities (public audience estimated at 1600 in 2018 and 1200 in 2019). Population knowledge scores on family planning (what is it, how to do it, and where to get contraceptives) increased, and access to contraceptives was facilitated. The main results are summarised in Table I. In 2019, asked if they wanted to use family planning, 70% of respondents answered positively but only 47% of adults and 18% of adolescents stated they use family planning (14).

Among the communities, the number of trained TBAs increased, and they assisted 915 pregnant women in 2018 and 2004 in 2019.

The motorcycle-ambulance transportation system implemented in six LHCs and supported in part by newly formed local saving groups, carried 156 (2018) and 122 (2019) women to deliver at MGH maternity.

Table I: implementation research quantitative results

Result	2016	2019	Increase (%)
Number of local health committees	6	20	233
Number of local health committees' members	70	337	381
Percentage of females with family planning knowledge	64	86	22
Percentage of males with family planning knowledge	64	83	19
Percentage of females with access to contraceptives	44	91	47
Percentage of males with access to contraceptives	65	90	25
Number of trained traditional birth attendants	16	89	456
Number of pregnant women referred to maternity by traditional birth attendants	59	708	1100
Number of pregnant women referred to ante-natal consultation with obstetric risk by traditional birth attendants	0	108	
Number of pregnant women with 1rst ante-natal consultation	1882	2393	27
Number of pregnant women with 4 ante-natal consultations	405	1155	185
Number of Marrere General Hospital' maternity deliveries	1243	1991	60
Number of children less than one year age' surveillance visits	1132	2139	89

The MGH-CMC met 13 times over two years (2018 – 2019), gathering 68 different LHCs members (TBAs, traditional and religious leaders), and 39 HPs (including the management team, MGH board, statisticians, doctors, and nurses). Subsequently, this increased volunteer participation in patient orientation, care, and cleaning activities (community volunteers were scheduled weekly to be at the hospital to support, inform, and educate users), it reduced the practice of charging illicit fees (and when they did happen, the complaints got to MGH management board and were quickly solved), and helped resolve dysfunctional human resource situations. The CMC also successfully raised further external funds and started construction on a "Mothers waiting delivery' house", outside the MGH, to promote and facilitate deliveries at the maternity.

The interviews revealed that the community believed the project's strategies to be acceptable, appropriate, and feasible. The main themes that emerged from the

qualitative analyses included the perceived beneficial nature of the interventions, and their ability to improve knowledge and attitudes about SRH. When asked about the viability of this project, one of our respondents said:

"*It is viable, yes, we cannot stop! We have to continue giving lectures in the communities*." (Traditional Leader, male, 46 years).

Discussion

Community participation through empowerment (15), is known to be essential to better health services but requires material and other inputs (16-17). When approached by trusted partners, communities are eager to decrease maternal and child morbidity and mortality. They volunteer to cooperate, and their leaders are willing to receive health training and are ready to participate in health education in their communities (18). The communities were incredibly happy with the local theatre and radio programs.

LHCs are strong preventive medicine and screening agents, able to participate in HUs and services management, and community education. The CMC intervention had a low cost (over two years we estimated USD 900) but was effective at improving health services and decreasing illicit charges, with leadership and monitoring support.
The project's volunteer Family Health Champions, TBAs training programs, community theatre dramas, radio programs, and engagement with adolescent initiation rite leaders, increased the local population's knowledge about SRH and rights, leading to more positive attitudes towards FP and hospital deliveries. These achievements have been demonstrated in other low and middle-income countries (19-21).
FP practice remains lower than possible and desirable due to economic constraints, religious and supply barriers.

TBAs became readily engaged as maternal health promoters and were recognized to be excellent referrers and protectors of mothers and babies, as seen in other studies (22). They were also found to be appropriate and accepted companions during the hospital deliveries (which was another interesting innovation); like evidence presented from other studies in Africa (23).

The transportation system facilitated many transfers though remained underused, due to technical difficulties (legal, mechanical, and communication), and in need of management improvements. Subsequently, during the last year of the research, external funding was procured to enable a social enterprise (Project Frango) to be initiated to assist the sustainability of this transport system.

Facing a financial and human resource crisis common in the public sector, health service performance, nonetheless, improved, sustaining an acceptable quality, and acquiring additional human and material resources. The local population recognized the good performance of MGH and MHC.

The overall emerging increased inclusivity, empowered community leaders and TBAs, to share their SRH and FP knowledge with their communities and improve their attitudes and practices.

This implementation participatory research method has shown a positive effect to empower the population, in terms of health knowledge, attitude, and participation in health services management (24).

Conclusions

This study shows that community empowerment and participation, at all levels of the MCH service care continuum, from community to hospital, enhanced with complementary interventions well contextualized, are acceptable, feasible, and effective in improving adolescent and adult SRH, in reducing maternal and new-born

morbidity and making significant community contributions.

To reduce maternal and child morbidity and mortality in Mozambique, we need to focus more investment on health information and education, by supporting trusted local partners, to help with the development and maintenance of LHCs, using the local language. These community partners can map, identify, and develop LHCs to strengthen the implementation of national policies and strategies, to improve MCH and the quality of delivery services. It is necessary to create, monitor, and support CMCs in all health centres and hospitals, using the HUs Challenges Survey Tool, to improve the complaints process, reduce illicit charges and improve the overall patient and provider experience.

Abbreviations

ACPH – Alert Community for a Prepared Hospital care continuum., CMC – Co-management committee. FHS – Faculty of Health Sciences. FP – Family planning. HP – Health professional. HU – Health unit. IDRC – International Development Research Centre. LHC – Local health committee. MCH – Maternal and child health. MGH – Marrere general hospital. MHC – Marrere Health centre. MISAU – Mozambican Ministry of Health. SRH – Sexual and reproductive health.
TBA – Traditional birth attendant. UniLúrio – Lúrio University.

Ethical issues

This research was allowed by the Faculty of Health Sciences of Lúrio University, Nampula Provincial Health Directorate, and approved by Lúrio University Bioethics Health Committee (02/CBISUL/16), and the University of Saskatchewan Bioethics Committee (15-112).

We followed all Helsinki Declaration (2013) recommendations, all participants were volunteers, anonymity guaranteed, free to desist if uncomfortable without any negative condition, signing or recording an informed declaration consent term. This research had no risk or remuneration to participants. They agreed to give their time and opinion on this topic to benefit the population, contribute to improving public health policy interventions and implementation research, and empower inhabitants with SRH knowledge. The study did not involve the use of animals.

Consent for publication

This manuscript does not contain data from any person. Not applicable. The authors declare they have reviewed this manuscript and agree to submit it to the Special Journal of Public Health, Nutrition, and Dietetic. The Faculty of Health Sciences at Lúrio University has authorized this publication.

Data/materials access

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Conflict of interests

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

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Authors contributions

Study protocol conception and design, and data interpretation and final approval of the version to be published were done by all authors (PP, MM, DZ, JM, AA, CM, RS, CB). In addition. Article draft (PP, DZ, RS), Data analysis: (PP, MM), data treatment, MM), Data collection (CM),

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