

Reducing Maternal Deaths Through Quality Improvement Intervention (Performance Improvement Approach)-A Case of Chadiza District

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Abstract:

➤ *Introduction:*

Most maternal deaths in Zambia occur during postpartum period, however the burden is disproportionately higher in some district in Eastern Province including Chadiza. The Performance Improvement Approach (PIA) was implemented in Chadiza District in 2021 to contribute to the reduction of maternal mortality. The overall aim of this quality improvement methodology is to analyze performance problems and setting up systems to ensure good performance is achieved. Through application of quality improvement approaches such as the Performance Improvement Approach (PIA), health workers strive to identify performance gaps and address them using the performance improvement approach.

➤ *Methods:*

Health care workers at district level in charge of maternal Health services. These included quality improvements focal point person at district level and, Nursing Officer at hospital level, District Nursing Officer, District Health Director and Midwives who were randomly selected were interviewed using a questionnaire. The study targeted 20 healthcare providers in Chadiza district. The study purposively selected Chadiza district because of active quality improvement projects, QI committees and had history of recording maternal death before.

➤ *Results:*

The findings indicated that the performance improvement approach as a quality improvement intervention is effective in reducing maternal mortality and insufficiency of human or financial resources affects the implementation of a quality improvement project. Additionally, competing activities in the district affects the implementation of a quality improvement project. It was also observed that the performance improvement approach (PIA) implementation lead to increased 1st ANC booking in first trimester, reduced maternal complication in labour and referred maternal cases reaching in time to the hospital thus effectively contributing to reduction from maternal deaths from three (3) in 2021(Pre-intervention period), two (2) in 2022 and two (2)2023 (Post intervention period).

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I. INTRODUCTION

Maternal death is the death of a women while pregnant or within 42 days of termination. Quality improvement (QI) methods, defined as strategies to improve the delivery of effective interventions, have long been used in high income countries to improve health care and outcomes (Berwick and Roessner,2002). In the year 2007, the World Health Organization identified quality improvement as a key component of improved health outcomes and greater efficiency in health care service delivery. Quality improvement approaches play an intrinsic role in reorienting care delivery systems from provider centred to integrated people centred health services where services are trusted, coordinated and respond to the needs of the individual.

Quality Improvement (QI) interventions may be a promising strategy for improving care for antenatal mothers and preventing avoidable maternal deaths. Quality improvement (QI) intervention is defined as a systematic and continuous approach that designs, tests and implements changes using real time measurements to improve the safety, effectiveness and experience of care Academy of (Medical Royal Collages,2016).

Quality Improvement interventions are planned as a cyclical process, starting with problem analysis to design a tailored intervention before implementation. Changes are constantly measured during and after implementation to understand the impact and adopt the required adjustments. Interventions are planned as cyclical process, starting with the problem analysis to design a tailored intervention before implementation (The Health Foundation,2021).

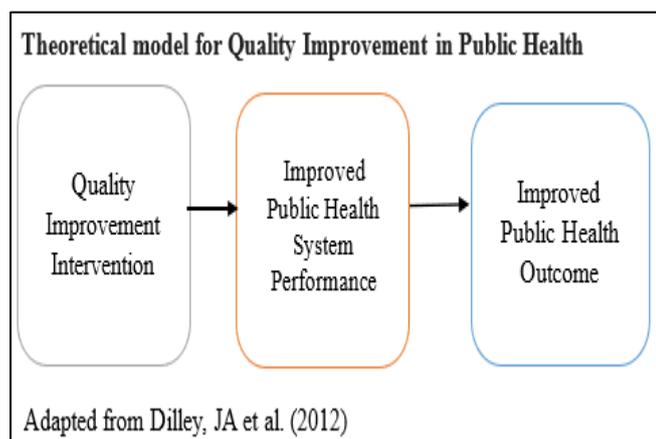


Fig 1 Theoretical Model for Quality Improvement in Public Health

The figure before you show the flow and change theory of a public health quality improvement intervention. It is expected that the quality improvement intervention (Performance

Improvement Approach) contribute to a better performing public health system (improved standards and skill set) and this leads to improved public health outcome (reduced maternal mortality rate).

Emphasizing how structures and processes within a system interact with each other to improve and achieve desired health outcomes is unique to the model of healthcare quality and has direct consequences on how emerging global health issues are tackled. It is against this background that the performance improvement approach is key in addressing and contributing to the reduction of maternal mortality.

➤ Chadiza District Profile

Chadiza District is Located about 80kms away from the Provincial Headquarter of Eastern Province (Chipata), Chadiza District has projected population figures for the period 2024 – 2026, which are 122,222, 128.209 and 134,491 respectively (Zamstat) with a growth rate of 2.3%. Agriculture is the main source of household income.

The free movement of people to and from neighboring countries and other interior districts such as Katete, Vubwi and Chipata, inter-marriages, cross border trade with the Republics of Mozambique and Malawi are common in the district. These common features affects the district population and has an impact on the demand for Healthcare services especially Maternal and Child Health services because the majority of people living along shared International and District boundaries receive Healthcare services from Chadiza Health facilities. However, there are no bilateral agreements with regards to cost sharing for Health service provision for people coming from neighboring countries.

More to that, Chadiza District has been implementing RMNCAH-N project since 2021. The aim of this project is to help the District with interventions to reduce maternal and perinatal deaths in the district. The District has a total of 5,888 expected pregnancies and 5,745 expected deliveries with a total of 26,631 women of child bearing age (Chadiza District DHSI2,2024).

II. METHODS

➤ Study Design and Setting

This article represents one sub -study that is part of a broader mixed method, single embedded case study assessing the impact of performance improvement approach. The case was defined as the implementation of quality improvement projects using the performance improvement approach (PIA) and its impact on reducing maternal mortality in Chadiza district.

According to a multilevel approach, different levels of stakeholders have different impact on the risk management process. These levels (district office, district hospital and health centres) are interconnected through processes of information and decision making. It is against these background that participants selected purposively from these levels were interviewed to help overcome single level limitation.

The inclusion criteria were participants who currently worked as health care workers. These included quality improvements focal point person at district level and Nursing Officer at hospital level, District Nursing Officer, District

Health Director and Midwives who were randomly selected were interviewed using a questionnaire. The study targeted 20 healthcare providers in Chadiza district. The study purposively selected Chadiza district because of active quality improvement projects, Quality Improvement committees and had history of recording maternal death before.

➤ *Data Collection*

All interviews were conducted in the month of February 2024 and audio recorded all face to face interviews at the participants workplace. Each interview had a duration of approximately 30 to 45 minutes. Open ended questions focused on areas of Changes observed during and after the implementation of a quality improvement intervention (Performance Improvement Approach), challenges faced and strategies adopted during the implementation of quality improvement activities and the impact of the performance improvement approach on reducing maternal death. While closed ended questions focused on areas of effectiveness of the performance improvement approach in reducing maternal mortality in Chadiza district.

➤ *Ethical Consideration*

Prior to the interview, the participants received an information sheet informing them about the study purpose, methods and data protection and the researcher credentials and occupation at the time of the study. Participants were also requested to give their written consent.

III. RESULTS

From a qualitative perspective results from our data of 20 interviews, identified 3 themes on the impact of performance improvement approach in reducing maternal deaths: (1) 1st ANC booking coverages, (2) Postnatal Care coverages, (3) Skilled delivery coverages

➤ *Theme 1 Improved 1st ANC Booking Coverages*

Participants agreed that ANC plays a critical role in contributing to reduction of maternal deaths thus quality improvement projects focusing on improving antenatal care identifies change ideas that are specifically targeted to reducing maternal deaths. The interventions put in place in Chadiza district according to the participants included: Comprehensive antenatal care (ANC) examination, Laboratory investigation and ultrasound scan, Availability of medical supplies (such as supplements for Anaemia, deworming drugs and anti-malarial), IEC on birth preparedness and family planning.

The performance improvement approach helps you to identify root causes easily and engage stakeholders to address the identified gaps.

- *District Quality Improvement Focal Point Person, Chadiza District* Quality improvement creates a platform for effective decision making because it has a generic design that makes you understand how to improve or address your performance problem
- *District Director of Health, Chadiza District*

➤ *Theme 2 Improved Postnatal Care Coverages*

Participants argued that most maternal deaths occur in the postnatal period and initiating a quality improvement project in this domain using the performance improvement approach is a timely mitigation measure for avoidable maternal deaths in the district. As a result of the performance improvement approach and the significance of quality improvement in maternal health, the district was able to strengthen postnatal care examination, family planning services with a focus on immediate postpartum family and dissemination of information on the methods available and effective laboratory test to rule out anaemia and urinary tract infections.

We come across new situation in a hospital setup because its impossible to anticipate every possible event. Adopting approaches such as the performance improvement approach gives you a picture of the primary cause of that particular problem during postnatal care.

- *Midwife Chadiza District Hospital, Chadiza District*

➤ *Theme 3 Skilled Delivery Coverages*

Participants agreed that skilled deliveries conducted by skilled attendants in health institutions is important for the survival of both the mother and her baby. According to the ZDHS of 2017 maternal death remains unacceptably high (398/1000) in Zambia. One of the reasons behind such is low coverage of skilled deliveries including few home deliveries in some health facilities because of holding on to cultural beliefs were a woman deny being attended to by a male health worker.

Skilled deliveries play a critical role in contributing to reduction of maternal deaths. The interventions put in place in Chadiza due to the implementation of the performance improvement approach as a quality improvement intervention included: ensuring that every facility has a qualified skilled personnel, orienting all health care workers in standard guidelines which says that all pregnant women are attended to by qualified health personnel, strengthen referral guidelines to ensure continuity of care at the next level of care and creating awareness on the importance of delivering at the health facility through the traditional leaders and the community at large.

- *District Nursing Officer, Chadiza District Health Office*

➤ *Changes Observed During and after the Implementation of this Quality Improvement Intervention (Performance Improvement Approach)*

The changes observed during and after the implementation of quality improvement according to participants included;

- Increased 1st ANC booking in first trimester
- Reduced maternal complication in labour
- Referred maternal cases reaching in time to the hospital
- Functional District Quality Improvement committee

- Increase in the initiation of Quality improvement projects in the district

➤ *Quotative Perspectives*

From a quantitative perspective, quality improvement efforts contributed to the reduction of maternal deaths from three (3) in the pre-implementation period of quality improvements projects focussing on reducing maternal deaths to two (2) maternal deaths in the post implementation periods.

The table below show some selected indicators that were improved as a result of implementing quality improvement interventions. 1st ANC booking coverage increased from 47% in 2021 to 52% in 2022 and 55% in 2023

indicating an average increase of 4% increase from the preintervention period.

For postnatal care coverage the district recorded a reduction of 10% in 2022, compared to the pre-intervention period in 2021 which was at 90% but further scored as increase of 8% in the post-implementation period in 2023, achieving a coverage of 88%.

Additionally, Chadiza district showed a positive increase for skilled delivery coverage from 72% in 2021 to 80% in 2022 and 94% in 2023 post quality improvement project implementation. A decline in maternal deaths was also noted from 3 deaths in 2021 to 2 deaths in 2022 and 2023.

➤ *Impact of the PIA as a Quality Improvement Intervention to Reduce Maternal Mortality*

Table 1 Impact of the PIA as a Quality Improvement Intervention to Reduce Maternal Mortality

Indicators	Pre-Intervention	Post-intervention	Post- Intervention
	2021	2022	2023
1 st ANC booking coverage	47%	52%	55%
Postnatal Care coverage	90%	80%	88%
Skilled delivery coverage	72%	80%	94%
Maternal deaths	3	2	2

Chadiza District DHSI2,2023

The performance improvement approach as a quality improvement intervention is effective in reducing maternal mortality in Chadiza district

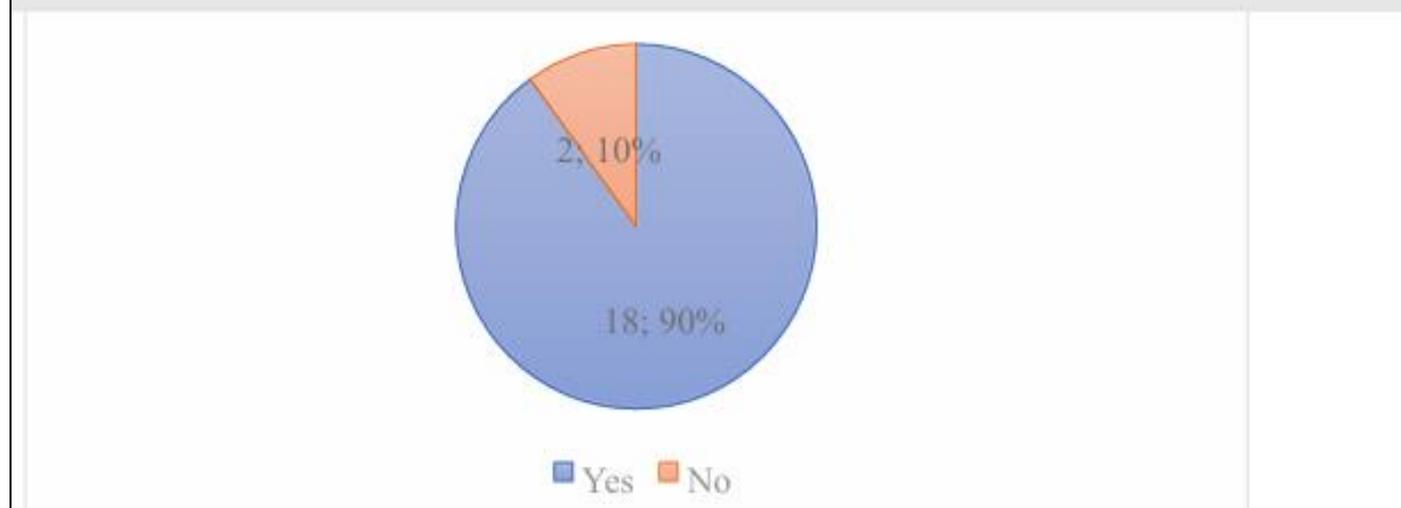


Fig 2 The Performance Improvement Approach as a Quality Improvement Intervention is Effective in Reducing Maternal Mortality in Chadiza District

The figure before you show the response from participants on the effectiveness of a quality improvement intervention (Performance Improvement Approach) in reducing maternal mortality in Chadiza district. 90% (18) agreed that the performance improvement approach is very effective in contributing to the reduction of maternal deaths in the district and 10% (2) argued that the performance improvement approach as a quality improvement intervention

does not effectively contribute to reduction of maternal mortality in the district.

➤ *Challenges Faced and Strategies Adopted During the Implementation of Quality Improvement Activities*

Table 2 Challenges Faced and Strategies Adopted During the Implementation of Quality Improvement Activities

Variables	Yes	No
Insufficiency of human/financial resources affects the implementation of a quality improvement project	17	3
Lack of information on the functionality of the performance improvement approach affect the implementation of a quality improvement project	19	1
Low meeting rate on quality improvement at the district affects the implementation of a quality improvement project	16	4
Competing activities in the district affects the implementation of a quality improvement project	19	1

➤ *Challenges*

- Few staff trained in quality improvement. The study indicated that only few staff were trained in Quality Improvement thus affecting the implementation of QI interventions in addressing identified gaps in the RMNCAH domain.
- Inadequate direct funding for quality improvement activities in the district. According to the participants, the district or facilities had inadequate direct funding for supporting and sustaining quality improvement projects.
- Inconsistent quality improvement meetings both at district and provincial level. The district outlined that the monthly QI meetings were critical in performance improvement but these meeting are not consistently done both at provincial and district level affecting effective decision making based on data.

➤ *Strategies*

- Establish and revamping of Zonal Mentorship Hubs. The district through the help of local partners managed to establish and revamp Zonal Mentorship Hubs to effectively disseminate quality improvement methodologies with a view of addressing identified maternal gaps. Conducting MPDSR review meetings. The District has made it a point to conduct maternal perinatal death surveillance and response meetings immediately the death occurs to analyze the gaps and come up with interventions that are implemented immediately. A follow up is also done to the community where the death occurred and a verbal autopsy is done to have a better understanding of the cause of death and sensitize the community on the prevention of maternal and perinatal deaths.

- Data review and clinical meetings. Data monthly review is conducted to discuss the performance and come up with the focus areas in the programmes with low performance. A mentorship and technical support programme is designed to make a follow up in the area of need in health facilities. Besides, clinical meetings are also held with facility staff to update them on the new guidelines and discuss management of certain conditions to improve the quality of health care services.

➤ *Implications for Healthcare Providers, Policy Makers and Future Research*

This study is of relevance to both policy makers, districts and the management levels within hospital and health facilities. It adds some insights to development and implementation of quality improvement projects focussing on reduction of maternal deaths. The study acmes the importance of ensuring that district quality improvement initiatives are accompanied by suitable resourcing, support and preparation to ensure that it has the best possible chance of being implemented effectively, results disseminated both at regional and national quality improvement conferences.

Additionally, this study depicts variation in quality improvement trainings, which fuels the idea that it will be of great importance to conduct training to health care providers in quality improvement regardless of the level of service provision. It would also be valuable to engage in cross-district comparative research to determine how quality improvement interventions plays a role in contributing to reduction of maternal mortality in the province.

IV. DISCUSSION

Quality improvement play a pivotal role in improving maternal health indicators but its implementation in Chadiza district is affected by insufficiency of human or financial resources, lack of information by staff on the functionality of the performance improvement approach, low meeting rate on quality improvement at district level and competing activities in the district affects the effective implementation of quality improvement projects in the RMNCAH domain. To ensure effective continuum of care program designing and implementation, it is crucial to understand the healthcare seeking gaps along the continuum pathway and the factors associated with the gaps. Quality improvement plays an essential part in addressing the shortfalls of previous agendas, realizing the goals put forth in the SDG era, and securing a healthy future for all by adopting participatory, system thinking and accountability-based approaches as such the performance improvement approach. Improving maternal health is one of the thirteen targets for the sustainable development goal 3(SDG-3) on health adopted by the international community in 2015.

The study has shown that quality improvement efforts bears fruits as shown in the reduction of maternal deaths, improved 1st ANC coverage, Postnatal coverages and skilled delivery at district level.

V. CONCLUSION

The implementation of the Performance Improvement Approach (PIA) as a quality improvement intervention in Chadiza District has yielded promising results in reducing maternal mortality. Key interventions such as comprehensive ANC examination, laboratory investigations, and strengthening postnatal care and skilled delivery services have contributed to notable improvements in maternal health indicators. Specifically, the district witnessed a reduction in maternal deaths from 3 in 2021 to 2 in 2022 and 2023, alongside increases in 1st ANC booking coverage (47% to 55%), postnatal care coverage (80% to 88%), and skilled delivery coverage (72% to 94%).

The PIA has proven effective in identifying root causes of maternal mortality and engaging stakeholders to address gaps. However, challenges such as insufficient human and financial resources, limited quality improvement training, and inconsistent meetings hinder implementation. Strategies like establishing Zonal Mentorship Hubs, conducting MPDSR review meetings, and data review have helped mitigate these challenges.

The study underscores the importance of resource allocation, support, and preparation for district quality improvement initiatives. It highlights the need for quality improvement training for healthcare providers and cross-district comparative research to inform policy and practice. Ultimately, the PIA offers a valuable framework for reducing maternal mortality, and its expansion and sustainability could significantly impact healthcare outcomes in Zambia.

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