Midwife-led quality improvement: Increasing the use of evidence-based birth practices in Uganda

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ARTICLE INFO

ABSTRACT

Background: Addressing the evidence-to-practice gap in midwifery is vital for improving maternal and newborn health outcomes. Despite the potential of involving midwives in quality improvement interventions to address this gap, such interventions are understudied. In a Ugandan urban hospital, midwifery practices with a significant evidence-to-practice gap have been identified as areas for clinical improvement.

Objectives: The primary objective of the Quality Improvement was to increase the uptake of identified and essential midwifery practices through a quality improvement approach led by midwives.

Participants: We enrolled 703 women aged 18 years and older with uncomplicated full-term pregnancies (between 37+0 and 42+0 weeks) who gave birth at the facility.

Intervention: The intervention focused on evidence-based practices with an identified evidence-to-practice gap: dynamic birth position, including women's involvement in birth position decision-making, perineal protection and intrapartum support. A team of midwives led a seven-month co-created quality improvement intervention. The intervention used Plan–Do–Study–Act (PDSA) cycles, following the Model for Improvement and included a train-the-trainer approach and weekly online support meetings.

Data collection: In this single-case prospective observational study, we compared pre-, during and post-intervention uptake of evidence-based practices. Trained research assistants collected data through interviews and observations.

Results: We observed improvements in the uptake of all clinical improvement areas. Dynamic birth positions increased from 0 % to 79 %, decision-making of birth positions from 0 % to 75 %, perineal protection measures from 62 % to 92 % and intrapartum support from 7 % to 67 %.

Conclusion: A multifactorial midwife-led Quality Improvement resulted in significant and sustained improvements in the uptake of evidence-based practices in maternal and newborn healthcare. If given the mandate and time, midwives can successfully lead Quality Improvements, which enhance the quality of care and close the evidence-to-practice gaps in maternal and newborn health. The study's results underscore the significance of developing effective strategies to enhance care quality and promote the adoption of evidence-based midwifery practices.

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Introduction

Quality health services provided by midwives hold the potential to improve maternal and newborn health outcomes and prevent an estimated 4.3 million maternal and newborn deaths annually (Nove et al., 2021). A wealth of resources on evidence-based practices for advancing midwifery and maternal and newborn healthcare is accessible (International Confederation of Midwives, 2019; World Health Organization, 2018, 2020a). Nevertheless, despite the comprehensive research and guidelines dedicated to improving maternal and newborn healthcare, numerous countries encounter difficulties in effectively implementing these practices and delivering quality midwifery care. One of the primary reasons behind these challenges is the frequent marginalisation of midwives, hindering their ability to organise and lead transformative changes within their professional scope (Blomgren et al., 2023a; Michel-Schuldt et al., 2020).

One way to involve midwives in change processes, thereby closing the evidence-to-practice gap, is through quality improvement (QI) projects. QI can enhance healthcare processes and outcomes, including responsiveness to patient safety, effectiveness, timeliness, patient-centeredness, equity and efficiency (Alexander and Hearld, 2009). Involving healthcare providers like midwives in leading such interventions is considered especially beneficial as they work closely with women and birth companions and know their needs (World Health Organization, 2020b).

In Uganda, a Ministry of Health QI strategy has notably elevated maternal and newborn healthcare standards nationwide (Ministry of Health Uganda, 2007, 2021). Nonetheless, implementing essential elements of evidence-based midwifery practices and adherence to national guidelines, including informed decision-making and respectful care remains a pressing issue (Babughirana et al., 2020; Nabirye et al., 2014).

The Midwize framework was developed to better take advantage of midwives' crucial role as change agents, promoting safe, patient-centred and cost-effective care while enhancing the uptake of evidence-based practices (Lindgren and Erlandsson, 2022). Sustainable change at the clinical level is pursued through collaboration between education, regulation, professional associations, civil society, and the clinical sectors (Lindgren and Erlandsson, 2022). To study ways to close the evidence-to-practise gap in maternal and newborn healthcare, a QI intervention, guided by the Midwize framework, was developed through a collaborative co-creation process involving all framework sectors (Blomgren et al., 2023b). During this process, clinical improvement areas were identified, focusing on three essential evidence-based midwifery practices where gaps between evidence and practice were apparent at the intervention site in Kampala, Uganda; i) using dynamic birth positions and involving women in decision-making over their preferred position, ii) using perineal protection measures and iii) providing support to women during birth.

The first clinical improvement area - dynamic birth positions - share similarities to upright (World Health Organization, 2020a) and flexible sacrum positions (Kibuka and Thornton, 2017) but emphasise all positions that relieve the sacrum bone from pressure and allow dynamic movement and flow between positions and between rest and activity during birth. Examples include using a birth chair, side-lying (lateral) positions, standing on all fours, kneeling and the knee-chest position. Facilitating dynamic birth positions involves engaging women in informed decision-making regarding their preferred positions and empowering them with control over their bodies and the birth experience (Lindgren et al., Handed in for review). Using such birth positions is recommended as they increase pelvis space, are associated with fewer medical interventions, shorter first stages of labour, and improved comfort for women (World Health Organization, 2018, 2020a).

The second clinical improvement area - using measures for protecting the perineum at birth - includes following the woman's urge to push (spontaneous pushing), guiding a two-step birth (where the head and body are not born during the same contraction), providing hands-on perineal support and avoiding routine episiotomies. These measures are recommended as they are linked to fewer tears, reduced pain, and lessened workload (Edqvist et al., 2017; World Health Organization, 2018, 2020b).

The third clinical improvement area - intrapartum support - includes emotional and physical support, comfort measures, information, advice, and advocacy (The Royal Colleges of Midwives, 2012) and is recommended as it can lead to more spontaneous vaginal births, shorter birth duration, positive experiences and fewer newborns with low five-minute Apgar scores (World Health Organization, 2018, 2020b).

The primary objective of the Midwize QI was to increase the uptake of these three identified evidence-based midwifery practices through a QI approach led by midwives.

The QI initiative's SMART (i.e the Specific, Measurable, Achievable, Results-oriented and Time-bound) aim was to, within one year:

1. Increase the use of dynamic birth positions to 60 % and raise women's involvement in decision-making over their birth position to 90 %.
2. Increase perineal protection measures (spontaneous pushing, two-step birth, hands-on perineal protection, and avoiding routine episiotomies) to 90 %.
3. Increase women's emotional and physical intrapartum support measures to 60 %.

Targets were set based on studies (Erlandsson et al., 2021; World Health Organization, 2018), clinical experience, and site-specific factors.

Method

Study design and setting

This single-case prospective observational study was conducted from May 2022 to May 2023 at a Ugandan urban public regional referral hospital, with 9,000 births per year, 40–50 % caesarean section rate and 32 midwives employed.

The Midwize intervention

Seven hospital-based midwife champions (termed "Midwize Ambassadors") spearheaded the QI intervention and were selected for their recognised role in supporting intervention implementation, sustainability, and scalability (Bunce et al., 2020; Powell et al., 2015). Details of the Midwize Ambassadors' selection process are provided in Blomgren et al. (2023b). In early May 2022, Midwize Ambassadors underwent a three-day training on the clinical improvement areas and QI methodology led by support team members (JB, CL, HL), with expertise in instructing clinicians on QI methodology and clinical midwifery practices. Ambassadors also received eight hours of clinical mentoring in the labour ward. Following the "train-the-trainers" approach, they then instructed and trained other midwives and staff to promote knowledge dissemination and collaborative learning (Orfaly et al., 2005; Powell et al., 2015).

At the start of the intervention, the research team and the Midwize Ambassadors planned the outline of the QI's key drivers using process mapping, leading to change ideas that could help impact the aim. The driver diagram evolved throughout the intervention, adapting to the emerging needs identified during the PDSA cycles until it reached its final form, as depicted in Fig. 1.

The Model for Improvement, which includes Plan-Do-Study-Act (PDSA) cycles (Langley et al., 2009), was used to create, test, and implement changes. The clinical improvement areas were tested simultaneously due to their interconnectedness. For example, advocating for dynamic birth positions without perineal protection may result in adverse perineal outcomes (Elvander et al., 2015) and
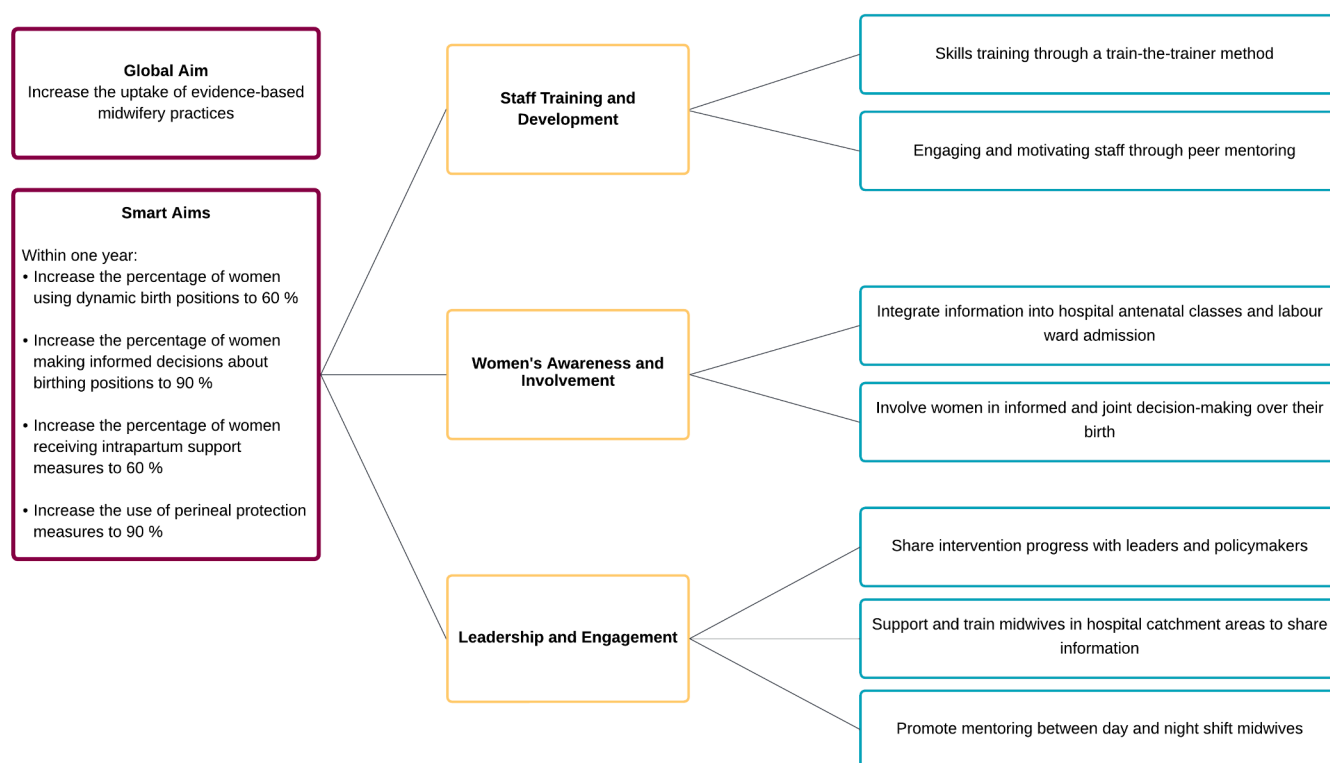
Fig. 1. Key drivers diagram illustrating the factors that drive change ideas aimed at increasing the adoption of clinical improvement areas.

empowering women in choosing birth positions is an integral aspect of intrapartum support (The Royal Colleges of Midwives, 2012).

During the intervention's testing of changes phase (May 2022- December 2022), the Midwize Ambassadors and support team, including researchers with experience in midwife-led QI and clinical midwifery mentoring (JB, CL. HL), met online weekly for 60 min to discuss PDSA cycles, analyse run chart data, and plan for the next week. Bimonthly in-person full-day meetings delved deeper into the improvement work.

Study population

Women aged 18 and above, with uncomplicated full-term pregnancies (i.e., $37 + 0$ to $42 + 0$ weeks), who attended a check-up 4–8 weeks after birth (baseline data) or arrived at the labour ward for birth during the time of data collection (intervention and follow-up data) were included in the study. We excluded women with multiple gestation, preterm births (<37 weeks), known complications during pregnancy, having a cesarean section, and known fetal abnormalities. Women giving birth at the hospital before reaching the labour ward were omitted, and their number was indeterminable. Nine women declined to participate in the study without giving a reason. Eight women consented to the study but were lost to follow-up after leaving the hospital quickly. Eleven women were excluded due to stillbirth ($n = 1$), arriving late in the second stage of labour ($n = 4$), or when the observer could not document multiple simultaneous births ($n = 6$), leaving 70 women for baseline, 490 at intervention, and 143 at follow-up.

Data collection

Data was first collected from women who gave birth between 1st and 30th April 2022 and came for a check-up 4–8-week after birth. In addition to data on maternal characteristics, information was gathered on decision-making regarding birth positions, the positions used during birth, and the intrapartum support measures received. Data was then collected at the labour ward during the daytime, starting when the intervention began in May 2022. The data collection form consisted of two parts: Part 1 involved systematic observations during birth, measuring decision-making, birth positions, intrapartum support, and perineal protection. Part 2 was collected within 24 h after birth through structured interviews focused on maternal characteristics and support given before the woman entered the birth room. The form originated from the Midwize Capacity Building Program, a leadership program where Midwize Ambassadors led QI in midwifery care (Erlandsson et al., 2021). The form was customised, tested and refined before the intervention began through collaborative sessions with the research team, research assistants, and Midwize Ambassadors. The QI project and the data collection expanded to include the night shift in October-November 2022 to test the changes under different conditions.

After implementation, follow-up data to measure sustainability were taken three and six months after the testing changes period (February and May 2023) for both day and night shifts for two weeks. Data collected to measure the uptake of the clinical improvement areas are presented in Table 1. Table 2 presents the participants included in the study per month.

Three experienced research assistants, all midwives, were recruited for data collection. They received one-day training and daily follow-ups from Mon-Fri with the lead author (JB). Data accuracy was overseen by three authors (JB, HL, KE) over seven days in May, three days in July, and three days in September through observation of data collection and meetings with the research assistants to ensure clarity and consistency.

Data analysis

SPSS version 28 was used for descriptive analysis of the data. Monthly percentages for each improvement area were calculated by dividing total "Yes" responses by observed women. Perineal protection and intrapartum support percentages were summed and averaged. Run charts, annotated with critical events, visually tracked changes and guided QI efforts.

Table 1
Data collection measures.

Practice	Definition	
	Yes	No
Dynamic Birth Position	Kneeling, Squatting, Birth chair, standing on all fours, or lateral (lying on the side)	Supine (lying on the back)
Decision-Making Over Birth Position	If joint decision-making between woman and staff or if the woman individually decided over birth positions.	The decision was made individually by a staff member.
Perineal Protection	If the staff: i) guided a two-stepped birth, ii) provided hands-on perineal protection, iii) followed the woman's instinctual urge to push (spontaneous pushing), iv) avoided an episiotomy.	If the staff did not: i) guide a two-stepped birth, ii) provide hands-on perineal protection, iii) follow the woman's instinctual urge to push (spontaneous pushing), iv) avoid an episiotomy.
Intrapartum Support	If a staff/companion/student gave: i) guidance on calm breathing, ii) gentle strokes, iii) massage, iv) encouraged the woman to use different positions before entering the birth room. If a staff/student gave v) guidance on calm breathing, vi) gentle strokes, vii) massage, viii) encouraged the woman to use different positions after she entered the birth room to give birth. ix) If women indicated receiving emotional support (encouraging words or emotional care and support) before or while in the birth room.	If the staff/companion/ student did not give: i) guidance on calm breathing, ii) gentle strokes, iii) massage, iv) encouraged the woman to use different positions before entering the birth room. If a staff/student did not give v) guidance on calm breathing, vi) gentle strokes, vii) massage, viii) encouraged the woman to use different positions after she entered the birth room to give birth ix) If women did not indicate receiving emotional support (encouraging words or emotional care and support) before or while in the birth room.

Table 2
Monthly participants.

	n (%)
April −22 (Baseline, Day and Night)	70 (10.0 %)
May −22 (Day)	32 (4.5 %)
June −22 (Day)	47 (6.7 %)
July −22 (Day)	39 (5.5 %)
August −22 (Day)	55 (7.8 %)
September −22 (Day)	49 (7.0 %)
October −22 (Day and Night)	128 (18.2 %)
November −22 (Day and Night)	140 (20.0 %)
May −23 - 2 weeks (Follow-up Measurements, Day and Night)	71 (10.0 %)
February −23 - 2 weeks (Follow-up Measurements, Day and Night)	72 (10.2 %)

Engagement of public in research

Women and birth companions were included in the co-creation of the intervention, where they took part in defining the improvement areas, especially considering the need for improved intrapartum support and decision-making. The co-creation is described in detail in Blomgren et al. (2023a, 2023b).

Results

Table 3 summarises participant demographics, showing the majority were aged 20–29, employed/self-employed, married, and had a secondary education. Approximately one-third were nulliparous. Table 4 presents the frequencies of uptake of clinical improvement areas at baseline, the start, end, and follow-up at six months.

PDSA cycles

Throughout the intervention's testing of changes phase, three primary PDSA cycles were conducted. These cycles were further subdivided into smaller iterations based on critical events deemed essential for improving the uptake. The primary PDSA cycles, the uptake of clinical improvement areas and critical events influencing the change are outlined in Fig. 2.

PDSA cycle one – staff training and development

In the first PDSA cycle, the plan was to advance the skills and knowledge of midwives.

Skills training

A two-hour training session led by the Midwize Ambassadors took place in late May 2022. All thirty-two midwives at the hospital were invited, and eighteen were able to join. The session involved sharing evidence behind the clinical improvement areas, and hands-on clinical training involved practising on fellow midwives and mannequins. Upon evaluating the session and considering the motivation and skills of the midwives, the Midwize Ambassadors recognised the need for clinical peer mentoring.

Peer mentoring

The Midwize Ambassadors started peer mentoring daytime midwives in late May. The mentoring was evaluated before gradually increasing the number of peers until July, when all daytime midwives were involved. Analysis of collected data, observations and feedback from staff recognised that more effort was needed to improve perineal protection. Hence, specific peer mentoring in this area began in June, and posters detailing perineal protection measures were created and displayed in the midwives' work areas. Staff feedback and data indicated improvement (see Fig. 2).

During the peer mentoring, several midwives expressed frustration in applying the intrapartum support measures due to insufficient time. Therefore, the mentoring emphasised how the midwives could better involve birth companions and students to support women. Some midwives initially hesitated to accommodate companions on the ward due to space and privacy constraints, particularly during busy daytime hours with students and doctors. However, as dynamic positions increased, midwives recognised the practical benefits of birth companions; companions could support women on the birth stool, provide massages, and guide calm breathing. Simultaneously, companions reported a sense of fulfilment and purpose, potentially contributing to a positive cycle of increased numbers of companions. The presence of companions during birth rose gradually from 16 % in May 2022 to 65 % in May 2023.

Frequent turnover made onboarding students and new staff challenging, so we tested providing printed materials and including a practical training session during the first days of student orientation. Even though midwife interns and students successfully increased support measures given to women during the intervention, it became clear that onboarding is an ongoing issue, which showed the need to continue allocating time to mentor students and new staff.

PDSA cycle two – women's awareness and involvement

Expanding upon insights gained from the first PDSA cycle, this second cycle was planned to increase women's and companions' understanding, use and involvement in the clinical improvement areas.

Integrate information into hospital antenatal classes and admission

The initial testing focused on providing information on dynamic birth positions, women's decision-making over birth positions and intrapartum support in the hospital's Antenatal Care (ANC). One Midwize Ambassador (CN) started conducting ANC classes, followed by
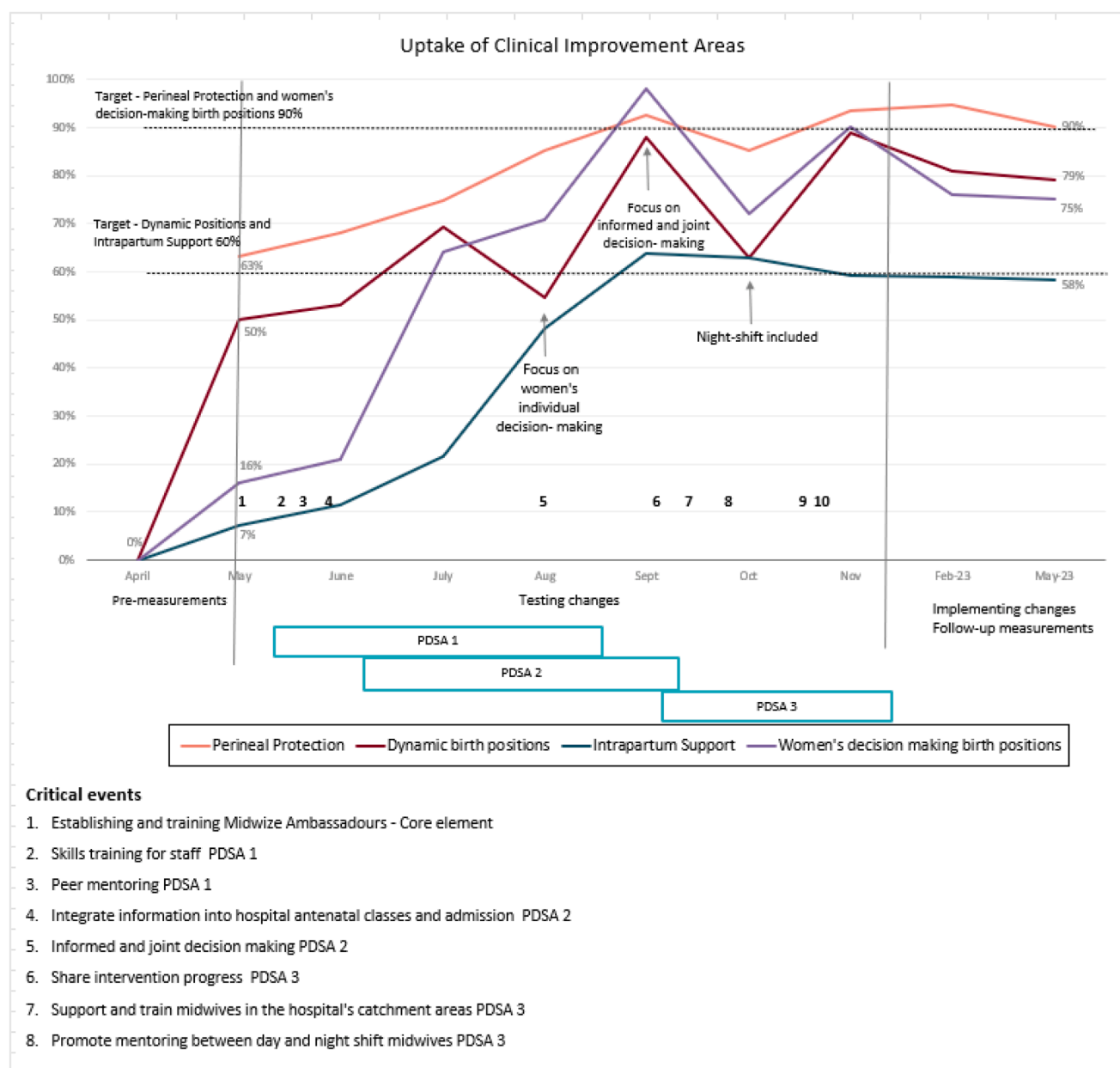
Fig. 2. Run chart illustrating the progression of clinical improvement areas from baseline to implementation, including critical events influencing the change.

an evaluation of women's understanding and analysis of data on women who stated they received information on the clinical improvement areas. Based on the evaluation, training was refined before involving more midwives.

The ANC information was given twice a week, each lasting approximately one hour. About 40–50 pregnant women attended each ANC class, and the information was given in English and Luganda. Many pregnant women lacked birth companions at the hospital's ANC classes and expressed a need for printed brochures to take home. Midwize Ambassadors and the QI support team created brochures in English and Luganda, tested them for readability, and distributed them to all ANC attendees. To address the challenges of a crowded ANC classroom and staff shortages, laminated posters with essential information were displayed on ANC walls and passed around during class. Despite efforts, some women still missed information, leading to the testing of instructional videos in Luganda and English to be displayed outside the scheduled ANC classes.

The percentage of women attending the hospital ANC and receiving

information before entering the labour suite increased from 0 % in May to 86 % in November 2022 and 81 % in May 2023. However, those attending ANC elsewhere were not reached by the information. As a result, information sessions, posters, brochures and videos were also incorporated into hospital admission procedures.

Informed and joint decision-making

Even though women's decision-making regarding birth positions was covered in the initial staff training and peer mentoring, an analysis of the data revealed the need for additional change ideas. Through peer mentoring, Midwize Ambassadors emphasised women's decision-making on birth positions. Directly asking women about their preferred birth position significantly increased decision-making but decreased the use of dynamic birth positions. After consulting midwives, it was revealed that women were not always empowered or sufficiently informed to choose positions but instead chose the ones they were familiar with (almost exclusively the supine position). Similarly, midwives sometimes only asked the question: "*Which birth position would you*

Table 3

Maternal characteristics.

	n (%) *
Participants, total	703
Maternal age, years	
<20	86 (12.2 %)
20–29	438 (62.3 %)
30–39	166 (23.6 %)
>40	9 (1.3 %)
Maternal Education	
No formal education	11 (1.6 %)
Primary education	139 (19.7 %)
Secondary Education	373 (53.6 %)
Technical or vocational certificate	98 (13.9 %)
College diploma	51 (7.2 %)
University Degree	27 (3.8 %)
Occupational status	
Employed for wages	196 (27.9 %)
Self-Employed	192 (27.3 %)
Unemployed	47 (6.7 %)
Student	20 (2.8 %)
Unpaid family worker	243 (34.6 %)
Parity	
Nulliparous**	257 (36.6 %)
1	169 (24.0 %)
2–3	206 (29.3 %)
≥ 4	48 (6.8 %)
Married	621 (88.3 %)
Previous stillbirths***	7 (1.7 %)
Previous full-term pregnancies***	419 (99.0 %)

* If f the reported number is less than the total number of the study population, this is explained by missing data on the specific variable.

**Nulliparous indicates women who have not given birth before.

***Among 423 multiparas.

like to use?" without accounting for the woman's specific need or giving her further information on the potential benefits and consequences of that position.

In response, the Midwize Ambassadors guided midwives to focus on shared decision-making and refining how the question was posed. Midwives helped women make well-informed decisions by suggesting beneficial positions tailored to the women's needs, providing information about benefits, encouraging movements, and probing the women about their preferred way of positioning themselves. The uptake of the dynamic positions then rose again, along with the number of women involved in decision-making about their birth position (see Fig. 2).

PDSA cycle three - leadership and engagement

To help ensure the changes made by the midwives would continue, the QI team identified a need to cultivate the involvement of all midwives and increase stakeholder buy-in across different clinical groups, including doctors, managers, and midwives in nearby facilities.

Share intervention progress

Some hospital staff expressed a need for more information on the QI's progress, and midwives wanted to assess if this would increase the uptake of improvement areas. Consequently, the Midwize Ambassadors tested sharing the results of the changes in the hospital departments' WhatsApp group. Initially, this seemed to spur enthusiasm, initiating comments on graphs and discussions. However, some staff members remained less involved. As a result, data, insights, and progress updates were also presented at department meetings attended by managers, midwives, and doctors. When Midwize Ambassadors presented progress at meetings and other professionals and managers witnessed improvements first-hand, their buy-in increased. Consequently, doctors embraced the changes, became advocates for the QI intervention and began suggesting alternative positions and support measures for midwives and women, for example, in cases of slow birth progress and risk of obstructive labour.

Table 4

Uptake of clinical improvement metrics at baseline, start, end and follow-up measurement.

	April 2022 (n = 70)	May 2022 (n = 32)	November 2022 (n = 143)	Follow-up measurements May 2023 (n = 73)
Dynamic birth positions	0 %	50 %	89 %	79 %
Decision-making birth positions	0 %	16 %	90 %	75 %
Perineal Protection – Average	–	62 %	92 %	92 %
Facilitating a 2-step birth	–	32 %	88 %	80 %
2-hands perineal support	–	97 %	94 %	90 %
Spontaneous pushing	–	61 %	98 %	100 %
No episiotomy*	–	60 %	89 %	96 %
Intrapartum support average	0 %	19 %	62 %	62 %
Support before entering the birth room				
Calm breathing	1 %	6 %	90 %	93 %
Gentle strokes	0 %	0 %	37 %	32 %
Massage	0 %	6 %	69 %	69 %
Encouraged to use different positions	0 %	56 %	68 %	69 %
Support in the birth room				
Calm breathing	1 %	13 %	89 %	92 %
Gentle strokes	0 %	6 %	27 %	27 %
Massage	0 %	12 %	43 %	37 %
Encouraged to use different positions	1 %	56 %	65 %	61 %
Support given either before entering or while in the birth room				
Women indicating getting emotional support (= encouraging words, care and support)	0 %	19 %	71 %	81 %

*Of all performed episiotomies (n = 75), 23 % were made on a fetal indication, and 77 % on the indication of a tight perineum/maternal indication.

Support and train midwives in the hospital's catchment areas

PDSA Cycle Two found that women who did not attend ANC at the hospital did not receive sufficient information regarding the clinical improvement areas before arriving to give birth. Therefore, Midwize Ambassadors tested extending information sharing to ANC clinics in the hospital's catchment area. ANC in-charges at seven nearby facilities underwent an 8-hour training workshop on effective information sharing in the clinical improvement areas. Posters, brochures, and videos were provided to be used in their antenatal wards. Our data revealed that the tested strategies were ineffective, as women at these ANC clinics still did not receive information. The failure can be attributed to the absence of follow-up visits to the facilities, which were planned but hindered by time constraints.

Promote mentoring between day and night shift midwives

Having observed improvements from tested changes during the day, the QI team decided to scale the changes by testing them during the night shift starting in October 2022. The scaling posed new challenges, as night-shift midwives seldom attended daytime department or midwife meetings, rendering them largely unaware of the lessons learned. A Midwize Ambassador (VB) provided night-time peer mentoring to address these barriers, drawing from daytime experiences. Additionally, all Midwize Ambassadors connected with night staff through telephone calls and during shift handovers to share insights.

Night-shift midwives handled more births per midwife and therefore put a particular focus on increasing birth companion involvement to alleviate the workload. The tested changes resulted in improved uptake for all clinical improvement areas.

All clinical improvement areas reached their targets and resulted in clear improvements (see run chart, Fig. 2). As such, the hospital decided to implement the clinical improvement areas.

Sustainability

Follow-up measurements illustrate a sustained improvement. At the 6-month follow-up, dynamic birth positions were maintained at 79 %, women's decision-making at 75 %, perineal protection at 92 %, and intrapartum support at 62 % (see Fig. 2).

One approach to achieving sustainability was to engage stakeholders guided by the Midwize Framework (Lindgren and Erlandsson, 2022). This included regularly meeting with Uganda Ministry of Health committees to align with ministry objectives, organising an online seminar for the Uganda Midwife Association to share lessons learned, dissemination at local conferences, and initial integration steps with an academic institution for student training and hospital practices.

To further improve sustainability, Midwize Ambassadors enhanced internal data collection by adding columns to the birth registration book and verbally assessed care quality before hospital discharge, querying women about what information they recived before birth, their understanding of the information, what support measures received and in what position they gave birth. Their efforts allowed Ambassadours to control hospital data independently and support their data-driven PDSA cycles even after the research team stopped collecting data. Additionally, starting in September 2022, the Midwize Ambassadors led the weekly QI meetings, compiling data and graphs to move the PDSA cycles and QI projects forward. In the final month of testing changes, the Ambassadours developed a Sustainability plan, defining meeting schedules and roles.

Discussion

This study aimed to improve the use of three essential midwifery practices benefiting women's and newborns' health: i) dynamic birth positions, including women's decision-making on birth positions, ii) perineal protection and iii) intrapartum support (World Health Organization, 2018, 2020b). Our study focused on developing strategies to bridge the knowledge-to-practice gap in maternal and newborn health. The QI intervention was developed using the Midwize Framework (Lindgren and Erlandsson, 2022) and led by a group of midwives at the intervention hospital. All clinical improvement areas reached or exceeded their targets and resulted in sustained improvements. The findings indicate that when midwives are granted the mandate and sufficient time, they can create sustainable changes, bridge knowledge-practice gaps, and improve the use of evidence-based practices in maternal care.

During our intervention, we identified three key strategies for change that formed the PDSA cycles: staff training and development, women's awareness and involvement, and leadership and engagement.

The strategy for change in the first PDSA cycle – staff training and development, was to enhance the skills and knowledge of midwives and doctors by Midwize Ambassadors leading training sessions and providing peer mentoring to staff members.

Studies show that having a team of champions leading change processes in healthcare can enhance an intervention's effectiveness while overcoming resistance, aligning interventions with workflows, and engaging stakeholders at all levels (Bonawitz et al., 2020; Powell et al., 2015; Wood et al., 2020). To effectively lead change, champions must be mandated, take ownership, demonstrate determination and be physically present during the point of change (Bonawitz et al., 2020; Bradley and Igras, 2005). However, assuming such aspects of a champion poses

distinctive challenges for midwives. Despite many times having a strong determination, the demanding work conditions and heavy workloads midwives face may restrict their ability to be physically present to lead improvements effectively (Blomgren et al., 2023a). Moreover, midwives often face barriers in obtaining the mandate and ownership necessary to enact changes in midwifery care, stemming from societal and gender norms, outdated organisational traditions, and differences in power and authority between professions (Blomgren et al., 2023a). In the QI intervention, the Midwize Ambassadors were equipped to address some of these barriers. They received training to lead QI efforts and were given extra time and mandate by hospital management to drive changes. By taking advantage of these enablers, they assumed project ownership of the intervention, which likely played a crucial role in improving midwifery care and ensuring buy-in at the hospital and broader health system levels.

The second PDSA cycle focused on increasing women's understanding and use of dynamic birth position, decision-making and intrapartum support. Previous studies show that education during pregnancy, focusing on normal birth processes and support mechanisms, effectively boosts women's confidence in coping with birth and leeds to more positive birth experiences (Demirci et al., 2023; Kate et al., 2016). However, the information must be individualised and available in different formats to be effective (World Health Organization, 2016). Similarly, critical elements contributing to enhanced acceptance among women in our QI intervention involved disseminating information during ANC birth preparedness classes and upon admission, utilising diverse formats such as verbal, written, and pre-recorded videos. The information shared at ANC and admission was vital for women to make informed choices about birth positions. Initial struggles in engaging women in decision-making underscore the importance of tailoring guidance to individual needs and knowledge, aligning with research indicating a preference among women for guided and collaborative partnerships with the midwife over sole decision-making authority (Vandevusse, 1999).

The third PDSA cycle - leadership and engagement- focused on strategies to cultivate involvement and stakeholder buy-in across different groups. It is widely acknowledged that to adopt an organisational change, the change should align with that organisation's beliefs, and workers should support that change (Langley et al., 2009). Since managers, doctors, and midwives were involved in the design of the QI intervention and recognised its alignment with hospital needs (Blomgren et al., 2023b), there was little pushback on testing and adopting the changes. However, some individuals were less engaged than others. When Midwize Ambassadors presented progress at meetings, and staff and managers witnessed improvements first-hand, their support strengthened. Therefore, it can be essential to share success stories and involve apprehensive workers in the QI project so they can experience the benefits.

While most change ideas in the testing phase were successful and sustainable, it must be acknowledged that not all tested changes led to an improvement (Langley et al., 2009). In our intervention, we failed to make ANC clinics within the hospital's catchment areas inform women about the clinical improvement areas. This failure emphasises the importance of forming local QI teams and adopting a long-term perspective when initiating and spreading changes, as shown in previous research and guidelines (Backhouse and Ogunlayi, 2020; World Health Organization, 2022).

Creating sustainable changes in clinical settings is often challenging (Zomahoun et al., 2019). We interpret the success of the QI intervention stemming from midwife champions leading the initiative, backed by a QI support team, hands-on clinical training for midwives through a train-the-trainers approach, the dissemination of varied information to women and companions, thoughtful reflection on optimal methods for involving women in informed decision-making, and developing a clear sustainability plan, including local data collection and designated task allocation. Additionally, the QI intervention was based on the Midwize

Framework (Lindgren and Erlandsson, 2022), which guided the inclusion of stakeholders from the creation (Blomgren et al., 2023b) to implementation, likely contributing significantly to driving the improvements by fostering stakeholder buy-in from multiple sectors.

Strengths and limitations

One of this study's key strengths is the public engagement and co-creation of the intervention. The participatory approach ensured that the intervention was tailored to the needs and preferences of the target population, which likely increased its acceptability and effectiveness (Beirão et al., 2017). Another strength is the selection and training of Midwize Ambassadors to lead the QI intervention. By using midwives already embedded within the clinical setting, the study effectively leveraged existing human resources to support the intervention's implementation, sustainability, and scalability.

The comprehensive data collection is another strong point of this study. Data were systematically gathered at multiple stages, including baseline, intervention, and follow-up periods. Additionally, the combination of observational data and structured interviews provided a rich dataset that strengthened the reliability of the findings. A limitation to this type of data collection is that the clinicians who were aware of being observed (i.e. the Hawthorne effect) might alter their behaviour. However, this effect was mitigated by the extended data collection period, which helps individuals habitate to being observed (Aujla et al., 2021). Habituation was likely intensified as the research assistants, who were midwives, seamlessly integrated into the busy ward environment alongside the staff and students

As a single-case prospective study, we cannot definitively attribute observed outcomes solely to the intervention (Ovretveit, 2002). However, weekly data analysis and meetings with the Midwize Ambassador and QI support team offered valuable insights into the reasons behind any changes observed.

The research findings can be used to shape policy and practice by showing the importance of prioritising and supporting midwives' mandates, resources, and time for leading improvements in midwifery practices.

Conclusion

This study shows that midwives can close the knowledge-to-practice gap in maternal and newborn care using a structured QI method. The midwives reached or exceeded the targets of three essential clinical improvement areas within midwifery: (i) facilitating dynamic birth positions and women's decision-making regarding birth positions, (ii) protecting the perineum, and (iii) providing intrapartum support.

The results underscore that, with a mandate and time to improve care, midwives can create lasting changes, bridge knowledge-practice gaps, and elevate evidence-based practices in maternal care. The findings of this study are important as failing to discover effective strategies to implement evidence-based midwifery practices may hinder global maternal and newborn healthcare improvements.

Ethical considerations

Ethical permission was granted by the Makerere SPH Research and Ethics Committee (Ref. nr: SPH-2021–174), Uganda National Council for Science and Technology (Ref. nr: HS1885ES), and the Swedish Ethical Review Authority (Ref. nr: 2021–05,539–01).

Information about the study and oral consent were provided before birth. In a calmer setting, the information was given again after birth and written informed consent was signed. Information was made available in English and Luganda, with the consent form read aloud for those with reading difficulties. Confidentiality was assured, and participants were informed that opting out would not affect their care.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve readability and language. After using this tool, the authors reviewed and edited the content as needed and takes full responsibility for the content of the publication.

CRediT authorship contribution statement

Johanna Blomgren: Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Helena Lindgren:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Dinah Amongin:** Writing – review & editing, Supervision, Project administration. **Kerstin Erlandsson:** Writing – review & editing, Supervision, Conceptualization. **Christina Lundberg:** Writing – review & editing, Project administration, Conceptualization. **Annette E. Kanyunyuzi:** Writing – review & editing, Project administration, Investigation. **Sarah Muwanguzi:** Writing – review & editing, Project administration, Investigation. **Victoria M. Babyrie:** Writing – review & editing, Project administration. **Ketty Ogwang:** Writing – review & editing, Project administration. **Dinnah Aineomugasho:** Writing – review & editing, Project administration, Investigation. **Namutosi Catherine:** Writing – review & editing, Project administration, Investigation. **Michael B. Wells:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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