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Midwives' self-perceived confidence in their knowledge and skills in Kenya: An observational cross-sectional study

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ABSTRACT

Background: Midwives' confidence in the requisite knowledge, skills and behavior acquired during training is essential for high-quality pregnancy and childbirth care and positive experiences by women and newborns.

Purpose: Assess the midwives' self-perceived confidence in their knowledge and skills based on ICM competencies in Kenya.

Methods: An observational cross-sectional study among 576 midwives from 31 public hospitals using a self-administered questionnaire. Confidence categorized as low, moderate or high and relationships between confidence and midwives' characteristics tested by Kruskal-Wallis tests.

Findings: A total of 495 (85.9%) midwives participated in the study with a median age of 37.0 (32.0–43.0). Most of the midwives were diploma nurse/midwives (295, 59.6%) followed by degree nurse/midwives (156, 31.5%) and diploma midwives (44, 8.9%). Majority of the midwives had high confidence in knowledge (57.2%) and skills (62.0%) in the labor and birth domain while the general competency domain had the least confidence in knowledge (30.5%) and skills (36.6%). Male midwives reported high confidence in skills compared to females (57.7% vs 45.0%, $P = 0.036$) with no differences in knowledge ($P = 0.148$). Midwives in tertiary hospitals reported higher confidence in knowledge and skills compared to those at county/sub-county hospitals ($P < 0.001$). There were significant differences between midwives' qualifications and confidence in knowledge on the general competency domain ($P = 0.02$) and skills in the labor and birth domain ($P = 0.017$).

Conclusions: Labour and childbirth domain and working in tertiary facilities were associated with high confidence in knowledge and skills. In-service capacity building opportunities for midwives to build their confidence in obstetric care is needed.

1. Introduction

Kenya has 342 maternal deaths per 100,000 live births (Kenya Demographic and Health Survey, 2014), which far exceeds the Sustainable Development Goal (SDG) of 70 per 100,000 live births. Reducing maternal deaths requires improvement in the quality of care and particularly relies on improving the quality of care offered by midwives (World Health Organisation, 2018).

Global debates on maternal deaths have focused on midwives' confidence and competence to provide care (World Health Organisation, 2018). There is consensus that high quality maternal and reproductive services require midwives who are confident and motivated in delivering care. Such midwifery-led services are associated with a reduction

in maternal deaths and improved health outcomes (Hunter et al., 2018; Mortensen et al., 2019; Shikuku et al., 2020).

Confidence is defined by Bäck et al. (2017) as "a feeling of self-assurance arising from an appreciation of one's abilities or qualities". Immediately after qualifying, midwives lack confidence in practice. Building confidence requires ample clinical experience with mentorship and coaching to help novice midwives become expert professionals (Fisher & Stanyer, 2018). Novice midwives must also establish a professional identity that is based on a scientific approach and acceptance of professional responsibility (Bäck and Karlström, 2020). Organizations, therefore, need to ensure that they provide an environment that helps midwives to become confident experts.

There is a close relationship between competence and confidence.

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Competence requires underlying knowledge and skills, and an ability to continue learning, but also the confidence or self-efficacy to put these into practice [Bäck et al. \(2017\)](#). Confidence is needed to enable independent practice and the courage to act autonomously in the clinical context [\(Beek, McFadden, & Dawson, 2019\)](#). Confidence enables decision making and also willingness to be accountable for one's actions. Self-evaluation of one's confidence and being more conscious of one's perception may also affect performance. [\(Kim, Choi, & Kweon, 2017\)](#).

In addition, a confident midwife may strengthen the pregnant woman's confidence in her own ability to control her pregnancy, birth and motherhood [\(Lellan, 2011\)](#). Midwives' confidence is also important to foster relationships of trust with women and ensure continuity of care [\(Hainsworth, Dowse, Ebert, and Foureur, 2021\)](#).

In terms of pre-service training, courses that offer more hands-on practical experience with feedback on performance are more likely to produce confident midwives. For example, Indian midwives trained in a Diploma course of general nursing and midwifery were 2–4 times more confident than midwives trained through a Bachelor Degree [\(Sharma, Hildingsson, Johansson, & Christensson, 2018\)](#). Another study from Australia found that midwives who qualified at the postgraduate level reported higher confidence compared to midwives who qualified as undergraduates [\(Davis, Foureur, Clements, Brodie, & Herbison, 2012\)](#). Other work from India and Africa suggests that students admitted as direct-entry midwives have higher self-rated confidence in antenatal care than their counterparts who were accepted into the midwifery program after qualifying in nursing or those who had dual degrees in nursing and midwifery [\(Hildingsson, Rubertsson, Karlström, & Haines, 2019b; Sharma et al., 2018\)](#).

One of the challenges in the various educational programmes and qualifications for midwives is that they lead to different levels of competence and clinical outcomes [\(Tarimo, Moyo, Masenga, Magesa, & Mzava, 2018\)](#). Kenya is no exception and offers certificate, diploma, undergraduate and post-graduate qualifications. Some midwives qualify as Kenya Registered Midwives, also known as direct-entry midwives, as they are trained for midwifery without nursing as a prerequisite. Kenya Registered Community Health Nursing and Bachelor of Science in Nursing qualifications are offered as blended programs that include nursing, midwifery, community health and psychiatry.

In response to this variation the International Confederation of Midwifery (ICM) developed a set of standardized competencies to guide midwifery education and optimize competences and confidence in clinical practice. Midwifery education in Kenya has also been hampered by the lack of standardization in midwifery competencies required of training programs. This has resulted in varying levels of competence and confidence among midwives during practice. Gaps in midwifery competence have influenced confidence and resulted in poorer clinical outcomes [\(Davis et al., 2012; Hildingsson et al., 2019a; Bäck et al., 2017\)](#).

The ICM has published four domains of midwifery competency: general competence, pre-pregnancy and antenatal care, labour and childbirth, and ongoing care of the woman and the newborn [\(Butler, Fullerton, & Aman, 2018\)](#). Furthermore, these competencies are required to optimize confidence and midwives feel confident when their education includes all these domains.

Therefore, the curriculum design and educational approach, intrinsic personal factors, organizational systems and practice environments may all influence midwives' confidence in practice [\(Sharma et al., 2015; Renfrew et al., 2014\)](#). Little information is available on the confidence of midwives in Kenya. The study's aim was to assess the self-perceived confidence of Kenyan midwives with different qualifications across the four ICM essential competency domains during clinical practice.

2. Methods

2.1. Study design

This article reports on phase one of an explanatory sequential mixed-methods study. The initial quantitative phase utilised an observational cross-sectional design to assess the self-perceived competence and confidence of midwives in their knowledge, skills and based on ICM competencies. The ICM tool measures the competence (knowledge skills and behavior) and confidence based on the competence. The findings on competence are published in a separate article, while this article focuses on self-perceived confidence. The key findings of the quantitative phase will inform the subsequent qualitative phase of the study.

3. Study setting

The study was conducted in primary, secondary and tertiary public healthcare facilities that offered reproductive, maternity and newborn child health (RMNCH) services in Kenya. Private and faith-based facilities were excluded as midwives were not always able to practice autonomously in these settings.

The midwifery qualifications in Kenya include certificate, diploma and higher diploma levels as well as degrees at bachelor, masters or even doctoral levels. The study focused on midwives who qualified with a diploma in midwifery through a direct-entry programme, known as a Kenya Registered Midwives (KRM). Nurse-midwives at diploma level were known as Kenya Registered Community Health Nurses (KRCHN) or held a degree with a Bachelor of Science in Nursing (BScN) and had competence in general nursing, midwifery, mental health and community health.

3.1. Study population

The study population was all the midwives working in public sector health facilities with one of three qualifications, the KRM, KRCHN or BScN. The sample was drawn from a total study population of 20,775 midwives who were practicing in Reproductive, Maternal neonatal and Child health (RMNCH) units in public institutions as at 2019 when the sample size calculation was done. Out of this total 432 were KRM, 19,477 were KRCHN and 866 BScN qualified.

3.2. Sample size determination

The sample size was calculated for each of the midwives' qualifications to ensure precise estimation of confidence for each educational program. According to the study on midwives' competence in Ethiopia by [Yigzaw, Ayalew, and Kim \(2015; 15:130\)](#), 31.6% of midwives attained the minimum required competency score. Kenya and Ethiopia are both in East Africa and share similar challenges. There is no such study that was found conducted in Kenya and thus the study from Ethiopia was used to estimate the proportion. Further, The ICM domains questionnaire that was used to collect the data consisted of both competency and confidence scores. The same population was used for the competency and confidence study thus this assumption was used as the estimated proportion to calculate the sample size. The sample size calculations also assumed a confidence interval of 95%, a margin of error of 5% and a design effect of 1.0. The sample size was also corrected for finite population size. Using this approach, the final sample size was 576, with 82 (8.8%) KRM, 295 (59.6%) KRCHN and 199 (31.5%) BScN.

3.3. Sampling technique

A multi-stage stratified sampling approach was used, as shown in [Fig. 1](#). The sample was split between the primary and secondary levels of care (in the counties) and tertiary hospitals based on the number of midwives who worked at RMNCH units. The sample needed from the

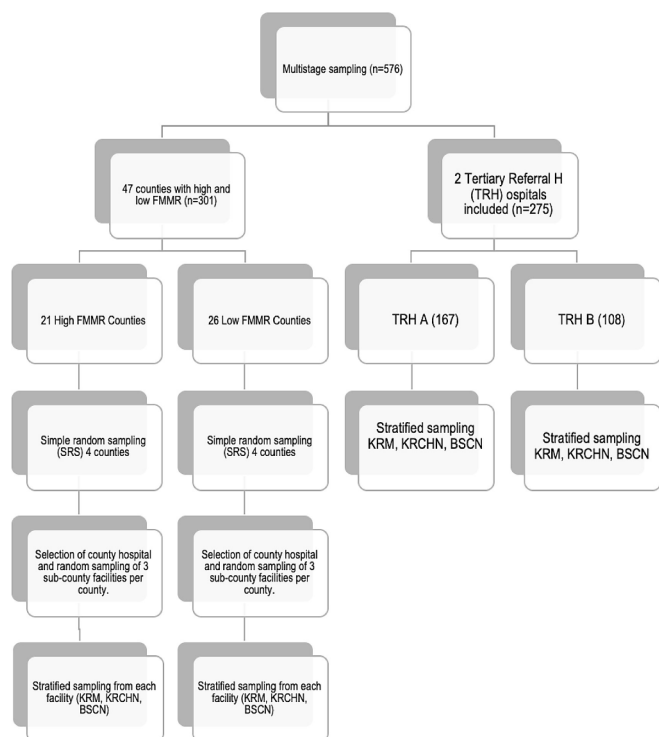


Fig. 1. Sampling framework.

counties was 301 (52.3%) and from the tertiary hospitals 275 (47.7%).

The 47 counties were divided into two groups based on their Facility Maternal Mortality Ratio (FMMR). Kenya considers an average FMMR of 97.5 as a threshold for high versus low performing facilities (KDHS, 2014, DHIS2). Twenty-one (21) counties, out of 47, had an FMMR > 97.5, while 26 counties had an FMMR of < 97.5 per annum. Four counties were then randomly selected from each of these groups (four with a high FMMR and four with a low FMMR).

All eight country referral hospitals were included in the study. In addition, three sub-county facilities were randomly sampled from each of the eight counties. In total therefore the study sampled 32 facilities in the counties. The required sample of 301 from these 32 facilities was further stratified by the required qualifications (KRMs (54), KRCHN (137), BSCHN (110)) and the distribution of midwives between the facilities.

The tertiary hospital sample of 275 was again stratified between the two hospitals based on the proportion of midwives employed. This implied a sample of 167 midwives from tertiary hospital A and 108 from tertiary hospital B. Stratification was then done according to the proportion needed with each qualification category (KRM (27), KRCHN (158) BSCN (89)) based on the distribution of midwives in the two facilities.

3.4. Data collection

The questionnaire was adapted from the ICM self-assessment tool 2019 version, which assessed the level of competence and confidence in knowledge, skills and behavior in the four ICM domains. Skills were defined as the ability to perform a specific task to a measurable level of performance, while behaviour was defined as a person's way of relating to actions of others (Essential Competencies for Midwifery Practice, 2019). The first domain (general competency) had 13 items, second domain (pre-pregnancy and antenatal care) had nine items, third domain (care during labour and birth) had two items, and the fourth domain (ongoing care of the woman and newborn) had five items (Essential Competencies for Midwifery Practice, 2019). The midwife's

confidence for each ICM domain in knowledge, skills and behavior was assessed using a 5-point Likert scale: 1-not confident, 2- somewhat confident, 3- moderately confident, 4-confident, 5-very confident.

Content validity was evaluated by a panel of nine experts in midwifery, who were either working in the facilities or educators in midwifery. They were requested to independently review and critique each item to ensure the appropriateness of the content and phrasing of each item using a 3-point Likert scale (3-essential, 1-useful and 0-not necessary). The content validity ratio (CVR) was calculated for each item and a ratio of 0.8 or more taken as acceptable (Waltz and Bausell,1981).

The tool was adapted by the panel of experts in terms of the content, the phrasing of the items, the instructions for completing the questionnaire, layout, formatting and context-specific demographic data. Two items, which the experts indicated were inappropriate for the Kenyan context, were deleted. These items related to the religious, cultural and /or socio-political environment. The removal of the two items was done prior to the pilot study.

A pilot study with 50 participants (10% of the sample size) was used to validate the questionnaire and the data collection process. These participants were from a different county, which was not part of the study. The pilot data was tested for reliability, and an average Cronbach's alpha coefficient of 0.87 was achieved in all four competency domains of the tool, which was adequate according to Taber (2018).

Data collection was carried out over four months, from December 2019 to March 2020. Research assistants (RAs) were recruited from other facilities, which were not part of the study. The assistants did not hold any managerial positions in order to minimize any power imbalance with the participants. The participant information sheet and consent form were given in paper form and electronically, 48 h before the start of data collection. Once the participants signed the consent form a copy was provided to them. A convenient time to complete the questionnaire was agreed upon, which would not disrupt service delivery. On the data collection day, any questions were addressed by the research team. This was an Interviewer administered questionnaire, where the RAs administered the questionnaire to each of the participants in a private room at the hospital. The RA interviewed each of the participants that took about 40–60 min and captured the data in real-time using organisation network analysis (ONA) software during the interview.

3.5. Data analysis

Data was checked continuously during data collection and any inconsistencies or incomplete data was corrected by following up with the respondents. Data captured in the ONA software was exported to the Statistical Package for Social Sciences (SPSS) version 26.0 for analysis.

Categorical data were summarised using frequencies and percentages, while continuous (numerical) variables utilised means or medians with standard deviation (SDs) or interquartile ranges (IQR) depending on the distribution of the data.

A mean score for each ICM domain was derived from the individual items. A mean score of <3.5 was interpreted as low confidence; a mean score of ≥ 3.5 and ≤ 4.5 was interpreted as moderate confidence while those who had mean scores >4.5 to 5.0 were coded as high confidence.

The difference between the confidence categories and sociodemographic characteristics, level of the facility and qualifications, were analysed using the Pearson's Chi-square test (Fisher exact where cells had counts <5). The difference between the dependent variable (confidence levels for knowledge and skills/behavior categorised/ordered as low, moderate or high) and the independent variables (socio-demographic characteristics, the level of the facility and staff qualifications) were analysed using the Kruskal-Wallis test. The Kruskal-Wallis test was used to determine if there are statistically significant differences between two or more groups of an independent variable on the ordinal dependent variable (confidence). Post hoc analysis was done where

there was significance difference. All statistical tests were tested at a 5% level of significance (p-value < 0.05).

4. Results

4.1. Characteristics of respondents

A total of 495 midwives completed the questionnaire achieving an 86% response rate (Table 1). The midwives with the KRCHN diploma qualification had a 295 (100%) response rate, those with the BScN degree qualification had 156 (78%) and those with the KRM diploma qualification 44 (54%).

The characteristics of the respondents are presented in Table 2. Data was collected from 31 facilities; two tertiary hospitals, 8 county hospitals and 21 sub-county facilities. The distribution between care levels was 196 (39.6%) at tertiary level, 142 (28.7%) at county hospital level and 157 (31.7%) at sub-county facility level.

Female respondents accounted for 391 (79.0%), whereas the male respondents were 104 (21.0%). Almost half of the respondents 237 (47.9%) were aged between 30 and 39 years and had a median age of 37 years (IQR 32.0–43.0). Respondents had a median of 9.0 years of work experience (IQR 5.0–15.0). However, the KRM respondents were significantly older and had more years of experience. The majority of respondents (71.1%) were from facilities with a high FMMR, although the proportion of midwives with each qualification did not differ significantly between high and low FMMR facilities.

4.2. Midwives' confidence in their knowledge, skills and behaviour

Table 3 shows how confident the midwives were with their knowledge, skills and behaviour across the ICM domains. The only domain in which the majority of midwives (57%) were very confident was that of labour and birth. Midwives were the least confident in their knowledge of general competencies (only 30% were very confident).

The majority of midwives were very confident in their skills and behavior for labour and birth (62%) as well as ongoing care of the woman and the baby (57%). The lowest levels of confidence were found in the general competency domain (only 37% were very confident).

4.3. Relationship between midwives' confidence and their characteristics

Table 4 presents the relationships between midwives' confidence with their knowledge, skills and behaviour and their characteristics. There was no association with age (p = 0.132), years of experience (p = 0.430) or the performance of the facility (FMMR), p = 0.436). However, men were significantly more confident than women in their skills and behaviour, (p = 0.036).

Table 5 shows the relationship between midwives' confidence in their knowledge and confidence in their skills and behaviour, knowledge and skills and behaviour were mostly correlated.

Table 6 presents the relationship between facility levels and confidence. There was a significance difference in confidence in both knowledge, skills and behaviour between levels. Confidence in both knowledge, skills and behaviour was highest at the tertiary hospitals and decreased significantly to county and then sub-county levels.

Table 7 presents the relationship between confidence and qualifications. There was no significant difference between qualifications and confidence in knowledge, skills and behaviour.

Table 1

A response rate of nurse-midwives with different qualifications.

	KRM	KRCHN	BScN	Total
Number required	82	295	199	576
Number achieved	44	295	156	495
Response Rate	53.7%	100.0%	78.4%	85.9%

Table 2

Characteristics of respondents.

Characteristics	KRM N = 44 Median (IQR) or n (%)	KRCHN = 295 Median (IQR) or n (%)	BScN N = 156 Median (IQR) or n (%)	Total N = 495 Median (IQR) or n (%)	p-value
Facility levels					
Tertiary hospitals	15 (34.1)	108 (36.6)	73 (46.8)	196 (39.6)	0.174
County hospitals	15 (34.1)	84 (28.5)	43 (27.6)	142 (28.7)	
Sub-county facilities	14 (31.8)	103 (34.9)	40 (25.6)	157 (31.7)	
Age of the respondents (years)					
Median	40.0 (32.5, 47.0)	36.0 (30.0, 43.0)	37.0 (33.0, 40.0)	37.0 (32.0, 43.0)	0.040
<30	4 (9.1)	54 (18.3)	19 (12.2)	77 (15.6)	0.015
30–39	17 (38.6)	132 (44.7)	88 (56.4)	237 (47.9)	
40–49	14 (31.8)	87 (29.5)	40 (25.6)	141 (28.5)	
>=50	9 (20.5)	22 (7.5)	9 (5.8)	40 (8.1)	
Gender					
Female	36 (81.8)	235 (79.7)	120 (76.9)	391 (79.0)	0.707
Male	8 (18.2)	60 (20.3)	36 (23.1)	104 (21.0)	
Work experience (years)					
Median	13.0 (6.5, 19.5)	7.0 (5.0, 15.0)	10.0 (5.5, 14.5)	9.0 (5.0, 15.0)	0.007
<5	8 (18.2)	70 (23.7)	25 (16.0)	103 (20.8)	0.001
5–9	6 (13.6)	106 (35.9)	51 (32.7)	163 (32.9)	
10–14	10 (22.7)	40 (13.6)	41 (26.3)	91 (18.4)	
15–19	9 (20.5)	32 (10.8)	23 (14.7)	64 (12.9)	
>=20	11 (25.0)	47 (15.9)	16 (10.3)	74 (14.9)	
Facility maternal mortality					
Low	11 (25.0)	96 (32.5)	36 (23.1)	143 (28.9)	0.090
High	33 (75.0)	199 (67.5)	120 (76.9)	352 (71.1)	

Table 3

Confidence with knowledge, skills and behaviour per competency domains (N = 495).

ICM competency domains	Low confidence	Moderate confidence	Very confident
Confidence with knowledge as per competency domains			
	n (%)	n (%)	n (%)
General competency	70 (14.1)	274(55.4)	151(30.5)
Pre-pregnancy and antenatal care	46(9.3)	235(47.5)	210(42.4)
Labour and birth	19(3.8)	193(39.0)	283(57.2)
Ongoing care of the woman & baby	28(5.7)	220(44.4)	246(49.7)
Confidence in skills and behaviour as per competency domains			
General competency	50(10.1)	258(52.1)	181(36.6)
Pre-pregnancy and antenatal care	31(6.3)	230(46.7)	231(47.0)
Labour and birth	23(4.6)	165(33.3)	307(62.0)
Ongoing care of the woman and baby	23(4.6)	189(38.3)	283(57.2)

Table 8 shows the association between midwives' confidence in their knowledge within the four competency domains and their qualifications. There was no difference in confidence between the qualifications apart from in the domain for general competence. In this domain KRM graduates were significantly more confident than KRCHN and BScN.

Table 4
Relationship between midwives' confidence with their knowledge, skills and behaviour and their characteristics (N = 495).

Characteristics	Low confidence n (%) or Median (IQR)	Moderate confidence n (%) or Media (IQR)	Very confident n (%) or Median (IQR)	p-value
Midwives' confidence with their knowledge				
FMMR				
Low	10(7.0)	81(56.6)	52(36.4)	0.439
High	22(6.3)	180(51.1)	150 (42.6)	
Age (years)	34 (25–56)	36 (24–59)	37(23–59)	
Gender				
Female	27(6.9)	213(54.5)	151(38.6)	0.148
Male	5(4.8)	48 (46.2)	51(49.0)	
Work experience (years)	8.0 (2.0–35.0)	10.0 (1–36)	8.0 (1.0–33.0)	0.430
Midwives' confidence in their skills and behaviour				
FMMR				
Low	9(6.3)	63 (44.1)	71 (49.7)	0.714
High	16(4.5)	171 (48.6)	165 (46.9)	
Age (years)	34(25–56)	36 (24–59)	37 (23–59)	0.158
Gender				
Female	23(5.9)	192 (49.1)	176 (45.0)	0.036
Male	2(1.9)	42 (40.4)	60 (57.7)	
Work experience (years)	8.0(2.0–35.0)	10.0 (1–36)	8.0 (1.0–33.0)	0.492

Table 5
Relationship between confidence in knowledge, and confidence in skills and behaviour (N = 495).

Confidence	Skills and behaviour			p-value
	Low Confidence n (%)	Moderate Confidence n (%)	Very Confident n (%)	
Knowledge				
Low confidence	23 (4.6)	9 (1.8)	0 (0.0)	<0.001
Moderate confidence	2 (0.4)	220 (44.4)	39 (7.9)	
Very confident	0 (0.0)	5 (1.0)	197 (39.8)	

Table 9 presents the relationship between midwives' confidence in their skills and behaviour per ICM domain and their qualifications. There were differences between the qualifications and the domain of labour and birth. In this domain the KRM graduates were significantly more confident than the KRCHN and BScN.

5. Discussion

Midwives varied in their confidence between ICM domains. Most of them were confident in the domain of labour and birth and least confident with general competencies. Midwives at tertiary hospitals were more confident than those at the county level.

Qualifications made little overall difference to midwives' confidence, but midwives with the KRM qualification were more confident in skills and behaviour with labour and birth. The midwives with the KRM qualification were fewer in number, older and had more experience. The reduced number of KRMs in practice could be due to the newer integrated programs (KRCHN and BScN) being more widely offered, while only one institution in the country is still offering the KRM program (Council, 2019).

In this study, only 40% of the respondents were ranked as very confident in both knowledge, skills and behaviour. This lack of confidence could be related to inadequate continuing professional development opportunities (Kemei, and Etowa, 2021). This finding is a worrying

Table 6
Relationship between facility levels and confidence.

Characteristic	Tertiary hospital midwives (N = 196) n (%)	County hospital midwives(N = 142) n (%)	Sub-county facility midwives(N = 157) n (%)	p value
Knowledge				
Low confidence	11 (5.6)	14 (9.9)	7 (4.5)	<0.001
Moderate confidence	66 (23.5)	74 (28.4)	121 (46.4)	
Very confident	119 (58.9)	54 (26.7)	29 (14.4)	
Skills and behaviour				
Low confidence	10 (5.1)	9 (6.3)	6 (3.8)	<0.001
Moderate confidence	60 (30.6)	70 (49.3)	104 (66.2)	
Very confident	126 (64.3)	63 (44.4)	47 (29.9)	
Post hoc analysis				
	Test Statistic	Std. Error	Std. Test Statistic	p-value
Confidence in knowledge				
Sub County-County	38.280	16.563	2.311	0.062
Sub County-Tertiary hospital	94.617	15.318	6.177	<0.001
County-Tertiary hospital	56.336	15.761	3,574	<0.001
Confidence in skills and behaviour				
Sub County-County	38.177	16.564	2.305	0.064
Sub County-Tertiary hospital	91.700	15.319	5.986	<0.001
County-Tertiary hospital	56.523	15.762	3.396	<0.001

Table 7
Relationship between qualifications and confidence categories.

Characteristic	KRM (N = 44) n (%)	KRCHN (N = 295) n (%)	BScN (N = 156) n (%)	p-value
Knowledge				
Low confidence	1(2.3)	17(5.8)	14(9.0)	0.357
Moderate confidence	22(50.0)	158 (53.6)	81(51.9)	
Very confident	21(47.7)	120 (40.7)	61(39.1)	
Skills and behaviour				
Low confidence	1(2.3)	12(4.1)	12 (7.7)	0.091
Moderate confidence	17 (38.6)	140(47.5)	77 (49.4)	
Very confident	26(59.1)	143(48.5)	67(42.9)	

trend in that midwives are expected to have both knowledge and skills and be confident in the delivery of care. Overconfidence may lead to unsafe procedures and decisions, while low confidence may lead to midwives not doing what they need to do, delaying decisions or referring unnecessarily (Mudokwenyu-Rawdon, Goshomi, and Ndarukwa, 2020).

Age had no significant relationship to confidence in this study. These findings were similar to the findings in a multi-country study among African nursing students by Hildingsson et al. (2019a), where they established that, age was not significantly associated with confidence.

Male midwives were significantly more confident in their skills and behaviour. This finding is similar to a study from seven African countries, where both age and sex were associated with confidence (Lindgren et al., 2021). This has been attributed to the male midwife's willingness to perform more advanced procedures and handle emergencies. The authors proposition is that male confidence is related to their socio-

Table 8
Relationship between qualifications and midwives' confidence in their knowledge per ICM domain.

ICM competencies	Qualifications			P-value
	KRM (N = 44) n (%)	KRCHN (N = 295) n (%)	BSCN (N = 156) n (%)	
General competence				
Low Confidence	3 (6.8)	46 (15.6)	21 (13.5)	0.02
Moderate Confidence	26 (59.1)	162 (54.7)	86 (55.1)	
High Confidence	15 (34.1)	87(29.5)	49 (32.5)	
Pre-pregnancy and antenatal				
Low Confidence	1(2.3)	29 (9.9)	16 (10.4)	0.058
Moderate Confidence	22 (51.2)	136 (46.3)	77(50.0)	
High Confident	20 (46.5)	129 (43.9)	61(39.6)	
Labour and birth				
Low Confidence	0 (0.0)	9 (3.1)	10 (6.4)	0.181
Moderate Confidence	17(38.6)	114 (38.6)	62 (39.7)	
High Confidence	27(61.4)	172 (58.3)	84 (53.8)	
Ongoing care of the woman and baby				
Low Confidence	0 (0.0)	12 (4.1)	16 (10.3)	0.129
Moderate Confidence	18 (40.9)	133 (45.2)	69 (44.2)	
High Confident	26 (59.1)	149 (50.7)	71 (45.5)	

Table 9
Relationship between qualifications and confidence in skills and behaviour per ICM domain.

ICM competency domains	Qualification categories			P-value
	KRM (N = 44) n (%)	KRCHN (N = 295) n (%)	BSCN (N = 156) n (%)	
General competence				
Low	1(2.3)	17(5.8)	14(9.0)	0.126
Moderate	22(50.0)	158(53.6)	81(51.9)	
High	21(47.7)	120(40.7)	61(39.1)	
Pre-pregnancy and antenatal				
Low	1(2.3)	19(6.5)	11(7.1)	0.167
Moderate	17(39.5)	135(46.1)	78(50.0)	
High	25(58.1)	139(47.4)	67(42.9)	
Labour and birth				
Low	1(2.3)	11(3.7)	11(7.1)	0.017
Moderate	11(25.0)	99(33.6)	55(35.3)	
High	32(72.7)	185(62.7)	90(57.7)	
Ongoing care of the woman and baby				
Low	0(0.0)	10(3.4)	13(8.3)	0.062
Moderate	12(27.3)	119(40.3)	58(37.2)	
High	32(72.7)	166 (33.5)	85 (17.2)	

cultural position within Kenyan society, where men grow up to be accepted as confident heads of the social systems.

Years of experience also had no significant relationship to confidence. This appears counterintuitive, although experience per se without reflection, feedback on performance or active learning may not build confidence. The findings differ from other studies by Hildingsson et al. (2019a), Jordan and Farley (2008), Bedwell, McGowan, and Lavender (2015), which indicated a significant relationship between confidence and work experience. Further, Skirton et al. (2012a) and Skirton, O'connor, and Humphreys (2012b) found out that newly qualified midwives lacked confidence in some areas, attributed to the importance of experience and confidence. we argue that the clinical environments offer different support to midwives after qualification such as continued professional development, mentorship, coaching and

resources to enable clinical practice in that context as compared to the Kenyan context (Yigzaw et al., 2015; Bäck et al., 2017; Donovan, 2008; Hildingsson et al., 2019b).

Those with the KRM qualification, who had direct entry into midwifery, were more confident in skills and behaviour in labour and birth. KRM qualified midwives were also more knowledgeable on ongoing care. These findings are similar to a study by Lindgren et al. (2021) and Hildingsson et al. (2019b) which found that students who enrolled as direct midwives were more confident than other students. These could be attributed to the longer duration of specific midwifery education, clinical training and hands on experience in the KRM programme thus links theory to practise and qualify with more exposure to care of the mother and the baby. This is supported by others that indicated a link between the amount of hands-on intrapartum experience and increasing confidence (Bäck et al., 2017; Sharma et al., 2015; Heilbrunn-Lang, de Silva, & Lang, 2015).

Midwives were least confident in their knowledge of general competences. This domain mostly deals with management and reproductive health knowledge. This may be due to the lack of updates on knowledge leading to less confidence and also resources for follow up care at the community level and other primary health care settings. (Kemei, and Etowa, 2021).

The levels of confidence were correlated between knowledge and skills and behaviour. Most respondents had moderate confidence in both knowledge, skills and behaviour. The practice environment has a significant influence on confidence. Confidence declined from the tertiary level to the country level.

Greater confidence at the tertiary level may be associated with more in-service training, a larger patient volume providing more exposure to complex cases and more expertise available to support them. Similar findings were published by a Swedish study by Bäck et al. (2017), which showed that midwives who received support during clinical practice and were not threatened by complicated cases were more likely to be confident (Bäck et al., 2017).

6. Limitations of the study

The study sample of KRM qualified midwives was less than needed in the sample size calculation and therefore our findings should be interpreted in light of the small sample size.

The sampled counties were from both High and low FMRR, the two counties hosting tertiary referral hospitals were also categorised as high FMRR. This attributed to the majority of the respondents from facilities high FMRR, which differed from actual sampling of respondents from facilities with high versus Low FMRR.

Data was collected in 21 out of 24 sampled sub-counties facilities, the study opted to drop the 3 sub-counties facilities; at the time of data collection, one sub-county facilities was offering limited services for the RMNCAH units while the 2 sub-county facilities could not be accessed by the research assistants due to the security issues at the region. The exclusion of the 3 sub-county facilities may have affected the overall response rate of Midwives.

Although only 87% of the midwives participated in the study, the study sample was large to answer the research question and therefore the results can be generalized.

7. Conclusions

Majority of the Midwives perceived to be very confident in their knowledge and skills & behaviour in labour and childbirth and lowest in the general competency domains. The male midwives were more confident in their skills & behaviour compared to females. Midwives working in the tertiary facilities were more confident in their knowledge; and skills & behaviour, compared to their counterparts working in the county and the sub-county hospitals.

8. Implications for practice

Our findings show that midwives have more confidence in their knowledge and skills to provide labor and childbirth care compared to the other critical areas antenatal and postnatal care domains which contribute to almost half of the maternal and perinatal mortalities in Kenya. Therefore, regular structured capacity building initiatives should be integrated in the working environment to strengthen their knowledge and clinical skills for improved maternal and perinatal outcomes. Midwives working in the tertiary hospitals were more confident in their knowledge and skills in ICM competencies compared to those working in lower level hospitals. As skilled health personnel, midwives at all facility levels should have the requisite knowledge and skills to provide emergency obstetric care to avert preventable maternal and perinatal mortalities. Therefore, there is need to establish continuous professional development and clinical mentorship opportunities to midwives working in the lower hospitals to build their confidence in knowledge and skills in obstetric care. Consequently, the county and sub-county facilities' staff who had lower confidence in skills and behaviour could be supported better through consultation with midwives and obstetricians placed at the national hospital through a toll-free number, making them more confident in delivering services.

There were disparities in the confidence of midwives in their knowledge and skills and behaviour in the four ICM competency domains. Further, research is needed to understand why midwives have low confidence levels in knowledge and skills in the three domains - general competencies, pre-pregnancy and antenatal care and ongoing care of the woman and baby essential for achievement of the reduction in maternal and neonatal mortality.

Ethical considerations

Ethical approval was obtained from the following institutions: Stellenbosch university Health and Research Ethics Committee 2 (HREC2) S18/10/254; AMREF Ethics and Scientific Review Committee (ESRC) P 652/2019; Moi Teaching and Referral Hospital-Moi University Institutional Research and Ethics Committee (IREC) 0003484; Kenyatta National Hospital-University of Nairobi Ethics and Research Committee (ERC) KNH-ERC/RR/86.

Research License from the National Commission for Science, Technology and Innovation (NACOSTI) Ref. no. 8777616. Permission was sought from the County Government, heads of health facilities and unit managers of the study facilities.

Written informed consent was obtained from all the participants. Participation in the study was strictly voluntary and participants were free to withdraw from the study at will. The study carried no risk to the participants and the benefits of participating in the study were well elaborated in the study participant information sheet and by the research assistant during data collection. For confidentiality, all data collection forms did not bear participant identifying information, but rather anonymous codes/pseudonyms were used.

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CRedit authorship contribution statement

Edna Tallam: Conceptualization, Data curation, Investigation, Formal analysis, Methodology, Supervision, Resources, Writing – original draft. **Doreen Kaura:** Conceptualization, Methodology, Data curation, Writing – review & editing. **Robert Mash:** Conceptualization, Methodology, Writing – review & editing. All authors read and approved the final manuscript.

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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Appendix A. Supplementary data

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