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Evaluating Quality of Midwifery Care Services in Primary Healthcare Facilities in West Kordofan Region, Western Sudan

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ABSTRACT

Background: Providing quality midwifery care services is crucial to reducing maternal morbidity and mortality now and beyond 2030. The maternal mortality ratio (MMR) in the state of West Kordofan is estimated at 121/100,000 Live Births (LB). Evaluating the quality of currently provided midwifery care services will influence the plan to reduce the high MMR. **Objectives:** To evaluate and measure the quality of midwifery care services provided at primary health facilities in West Kordofan, Sudan. **Methods:** A cross-sectional community-based study was conducted in West Kordofan state, Sudan. Through this, a total of 291 primary healthcare facilities in seven municipalities and the performance of the corresponding 291 midwives were assessed using the Donabedian framework (Structure, Process, Outcome). To assess the patient-reported outcome measure, 582 patients who served in the selected primary healthcare facilities were surveyed using a five-point Likert scale. **Result:** The mean ±SD of the age in the midwife's group was 34.09 ±10.3, while the mean (SD) age of the women was 30.2 ± 7.6. Assessment of the midwife's performance was effective, expressed in percentages ranging between 75% - 96%. The midwives who received training after graduation were found to be (79.7%), and those who have been recruited in the health system were only (50%). Consumables and essential equipment were found to be adequate, with a comprehensive score of 79.34% and 74.06% respectively. Assessment of the overall women's satisfaction with midwifery revealed that 48% were very satisfied, 25% satisfied, 10% were neutral, 6% dissatisfied, and 11% were very dissatisfied. **Conclusion:** The current study showed that the midwifery services provided in the state of West Kordofan were of relatively acceptable quality. However, some weaknesses around investigations, family planning methods, and supervision were noticed. Therefore, quality research to generate actionable recommendations to address these weaknesses is needed.

Keywords: quality of midwifery care, midwives, maternal mortality.

Key messages: ***1.*** *Midwives who are skilled and knowledgeable contribute significantly to providing safe and high-quality maternal care.* ***2.*** *The availability of adequate medical supplies and equipment, together with qualified midwives, can lead to a better care experience.* ***3.*** *Deployment of midwives into the health system makes them more valued and empowered healthcare practitioners; as a result, they become more accountable for providing quality care.* ***4.*** *Valued, deployed, and remunerated midwives are strongly associated with increased patient satisfaction with midwifery care services.*

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INTRODUCTION

Midwifery remains the first point of care for pregnant women, especially in rural areas in sub-Saharan Africa, who suffer from increased maternal and neonatal mortality rates. Maternal mortality rate (MMR) of more than 200/100000 live births (LB) or more is considered unacceptable [1]. Globally, in 2020, around 290,000 pregnant women died during the course of pregnancy or childbirth; the majority (70%) of deaths occurred in Sub-Saharan Africa [2]. In Sudan, based on the Sudan Household Health Survey 2nd round (SHHS2-2010), the MMR was estimated at 216/ 100,000 LB [3]. A high percentage of home delivery is among the most important underlying causes of maternal deaths in Sudan [4] This justifies the importance of midwives in providing maternal care for those who have no access to giving birth at healthcare facilities, as recommended by the World Health Organization (WHO).

A growing body of compelling evidence shows that high-quality midwifery care contributes significantly to reducing maternal and child morbidity and mortality [5]. Moreover, research findings have shown that, in addition to their significant role in improving maternal healthcare outcomes, midwives are the most appropriate and cost-effective healthcare professionals to provide care during normal pregnancy. Sudan has introduced the midwifery scaling-up strategy as a quality improvement measure. The primary focus of this strategy is to enhance maternal healthcare outcomes, particularly in rural populations and conflict-affected regions, through the support of midwives. To do so, the decision to increase the intake, deployment, and remuneration of midwives has been made. However, the extent to which this strategy is successfully implemented and whether the desired outcome is achieved is not fully understood.

To this date, there is no quality research focus particularly on the quality of midwifery care in our region, and this gap needs to be addressed. Therefore, this study aims to evaluate the quality of midwifery care services using the Donabedian framework [6]; an easy-to-apply and widely used model for assessing the quality of care [7]. Most importantly, this framework allows us to explore the entire system, which midwives work. In other words, the framework examines the quality of care through three elements- structure, process, and outcome – which could describe exactly what is happening in the area of the midwifery field. Another distinguishing characteristic of this model is that it embraces the concept of patient safety by focusing primarily on achieving the best possible outcomes for patients [8]. In addition to the assessment of the result and outcome of midwifery care as a quality intervention strategy, this study can achieve a wide range of purposes for different stakeholders. For instance, it informs choices for service users and allows policy and decision-makers to develop additional improvement strategies to ensure quality midwifery care services.

METHODS

Study design and setting

This is a cross-sectional community-based study, conducted across 7 municipalities in the state of West Kordofan, in western Sudan, during the period from January to April 2017. The State is spread over a total area of 114 thousand square Kilometres and hosts around 2 million people. Of them, 48% were male, and 52% were female; among them, 436462 were estimated to be women of reproductive age. Rural residents represent 70.6%, whereas 19.1% live in urban areas, and 10.3% are nomads. According to the State Health Map, 2016, administratively, the state is made up of 14 municipalities, 48 administrative units, and 2354 villages. This study has two distinct components of the population (midwives and women of reproductive age, who were served by those midwives during the study periods). Key inclusion criteria for midwives were all trained midwives who worked in the selected primary healthcare facility for more than 1 year. Regarding the second component of the study population, women who received midwifery care, the inclusion criteria were any woman of reproductive age who attended the selected primary healthcare facility seeking antenatal, intranatal, or postnatal care. By contrast, both midwives who are working in secondary care facilities (hospitals) and women attending private clinics were excluded from the study.

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Sample size and sampling technique

The total number of midwives in the state is 1193, of which 291 midwives, who completed the basic midwifery training and worked in the selected community for more than one year, were selected, using the following formula:

$$n = \frac{p(1-p)}{(SE \div t) + [p(1-p) \div N]}$$

Where:

n = sample size, N = population size, p = percentage picking a choice expressed as a decimal 0.5 used for sample size needed, t = confidence interval=1.96, SE = standard error 0.05.

At the level of municipalities, the midwives' sample size was calculated using the following formula:

K = n/N*L

Where: K = sample size per municipality, n = number of midwives in the selected locality, N = total number of midwives in the state, L = study sample size.

Since the main focus of this study is to give an overview of the quality of midwifery care services, in the entire state of West Kordofan, the study sampling technique followed a multi-stage random sampling technique, which involves 4 stages. Briefly, seven out of fourteen municipalities in the state were randomly selected in the first stage. In the second stage, thirteen out of forty-eight administrative units were randomly selected. In the third stage, the villages without midwives were purposely excluded from the study. In the fourth stage, fortunately, every village had a primary healthcare centre or unit with one midwife; therefore, all midwives were selected in the targeted villages. To measure the women's satisfaction with the provided service, a total of 582 women, of reproductive age, who received routine noncomplicated maternal care, were selected, based on the fact that every midwife serves 2-4 women daily.

The data from both study population groups were collected using a structured checklist and questionnaire. The checklist is adapted from a study [9] Some modifications on the checklist have been made to fit the structural component of the Donabedian framework, which has been applied as an evaluation model. The main checklist's components are medical equipment, supplies, consumables, and medicines. Unlike the checklist, the questionnaire is self-designed. However, to ensure the collected data's validity and reliability, the questionnaire and the checklist were revised carefully by different statisticians and experts, and a pilot study involving 30 midwives and 30 women was conducted. Most importantly, to have effective communication with the targeted study participants, well-trained enumerators were chosen. It was considered helpful to recruit enumerators with experience in data collection, culture, tradition, and customs of the rural people to build trust among the target groups.

The study's variables were categorized according to the evaluation framework into structure, process, and outcome variables. Direct supervision and a checklist were applied to measure the structural variables. To measure the process variable, the role-play technique was applied. A five-point Likert scale - very satisfied, satisfied, neutral, dissatisfied, and very dissatisfied – was applied to measure the satisfaction of women with the midwifery services, which is considered an outcome. Only those who reported being "satisfied" or "very satisfied" were considered as satisfied, and other responses were considered as dissatisfied. So, the following summary was used by the researcher: Satisfied = very satisfied +satisfied, whereas Dissatisfied = very dissatisfied +dissatisfied +neutral. To calculate the mean satisfaction, a scoring system was developed as follows: very satisfied = 5, Satisfied = 4, Neutral =3, Dissatisfied = 2, very dissatisfied = 1. Therefore, for each item, a score ranging from 1-5 was obtained. Most importantly, to determine the classification of mean satisfaction, a cut–off point of 3.4 was applied. This cut-off point is calculated as follows:

The upper limit for dissatisfaction = lower limit (No. of items in Likert scale -1)/total No. of items in the Likert scale* No. of items in the dissatisfaction category. i.e. = 1+ (4/5*3) = 1+ 2.4 = 3.4. The questionnaire on women's satisfaction was adapted from the WHO framework for improving the quality of maternal and newborn care [10]

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The questions on this part of our study covered areas such as communication, respect for dignity and confidentiality, and provision of appropriate care.

Ethical Considerations

Approval from the Sudan Medical Specialization Board and the Ministry of Health in the state of West Kordofan was obtained. Written Informed consent was obtained from all participants.

Statistical analysis

Data were analysed using Statistical Package for Social Science (SPSS) version 24 software (Chicago, IL, USA). Descriptive statistics were conducted, and study findings were reported using frequency tables and percentages. Furthermore, a chi-square test was used for the association between categorical variables; a p-value less than 0.05 was considered significant. As has already been noted above, well-trained data collectors were chosen, and experts on data analysis were consulted to handle any missing data. Experts in the field of maternal care and midwifery were consulted to address potential confounders.

RESULTS

The study covered (291) midwives who provide midwifery services at primary healthcare facilities and (582) women of reproductive age who benefit from those services, both types of the population under this study, with a response rate of 100%. The result of this study was structured according to the guidance of the Donabedian framework (6) , which states Structure, Process, and **O**utcome. **(Table 1)**

Table 1 shows the characteristics of the participants (midwives and their clients) in the state of West Kordofan, Sudan.

Item	Midwives' characteristics n= 291	Women's characteristics n=582
Mean ±SD of the age	34.09 (10.3)	30.2 (7.6)
Primary education	213 (73.2 %)	347 (59.6)
Secondary education	21 (7.2%)	192 (33.1)
University education	57 (19.6%)	43 (7.3)

Table 2 provides results for two important elements of the structure quality of care: hiring midwives into the health system and having in-service training. In terms of employment, the result shows that around half (50.9%) of midwives have been hired into the health system. As far as training is concerned, 79.7% received formal training after graduation, while 20.3% did not receive formal training.

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Table 2 illustrates the employment and training status of midwives in West Kordofan, Sudan, 2017 (n=291)

No.	Item	Status			
1.	Employment status	Yes		No	
		Frequency	148	Frequency	143
		%	50.9	%	49.1
2.	Training After Graduation	Yes		No	
		Frequency	232	Frequency	59
		%	79.7	%	20.3
3.		Yes		No	

Figure 1 demonstrates the percentage of midwives who were regularly supervised by the directorate of primary healthcare at the state and local levels, and those who did not receive any supervision, either from the locality or the state.

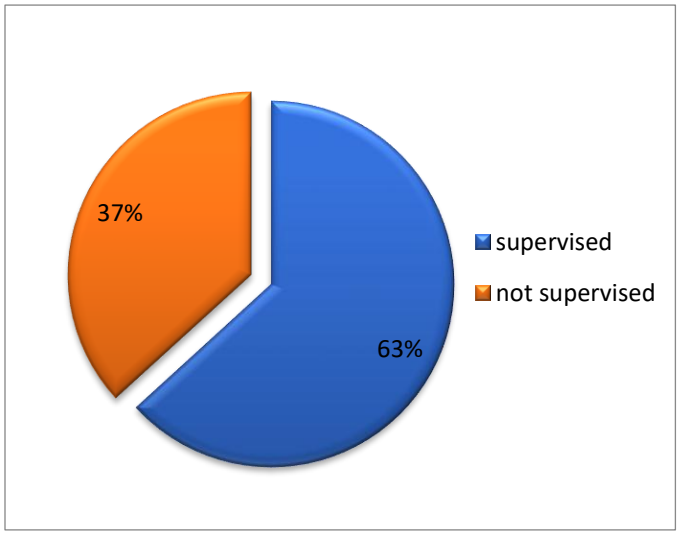

Figure 1 shows the result of the supervision of midwives, West Kordofan State, 2017 (n=291)

All midwives who participated in the study have reported a significant availability of consumables and medical supplies, with a comprehensive score of 79.34%.

As demonstrated above, all midwives have reported considerable availability of medical equipment needed in their delivery boxes, with a percentage ranging between 71.8 - 90.7. The exception was for "availability of torch," which scored 57.0%.

In terms of skills and knowledge required to provide midwifery care, our results showed that all midwives demonstrated adequate skills and competencies, with a percentage ranging between 75.3 to 94.2, as illustrated in Table 3.

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Table 3 shows the result of midwives' performance during ANC, West Kordofan, Sudan, 2017 (n=291)

Steps of examination of a pregnant woman		Frequency	Percentage
	History taking	227	78.0
	General examination	263	90.4
	Obstetric examination	267	91.8
	Appropriate investigations	247	84.9
	Health promotion	250	85.9
Steps of obstetric examination			
	Gestational age	265	91.1
	foetal presentation	260	89.3
	Foetal engagement	267	89.3
	foetal heart sound	264	90.7
	Lower limb oedema	219	75.3
High-risk pregnancy			
	Primigravida less than 16years	274	94.2
	Primigravida more than 35 years	260	89.3
	Short stature	231	79.4
	PIH	248	85.2
	Multiple pregnancies	248	85.2
	Prepartum haemorrhage	248	85.2
	History of cesarean section	237	81.4
	Abnormal presentation	257	88.3

This finding indicates that the majority of midwives have adequate knowledge to deliver quality midwifery care; however, some of them are weak in the interpretation of some clinical signs, such as lower limb oedema. Out of the 582 women who participated in the study, two-thirds (77.5%) were housewives, 21.8% were public employees, and only 0.7 worked in the private sector. More than 50% of participants have primary education, while the rest are distributed between Intermediate 10%, Secondary 23% and university 7.3%.

Table 4 demonstrates the level of women's satisfaction with midwifery care in West Kordofan, Sudan, 2017 (n=582)

No.	Item	Satisfied	Diss-satisfied	Mean	SD
1.	Women are timely assessed and given appropriate care	544(93.4%)	38(6.5)	4.52	0.77
2.	Women's confidentiality is respected	534(91.7)	48(8.2)	4.54	1.97
3.	The needed information is exchanged between midwives and women and their families	442(75.9)	140(24.0)	4.04	1.15
4.	The environment in which maternal care is provided is clean	500(85.9)	82(14.0)	4.28	0.88
5.	Women have access to skilled midwives to provide the services	428(73.5)	154(26.4)	4.04	1.15
6.	Equipment and other medical supplies for routine care are available	509(87.4)	73(12.5)	4.41	1.83

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7.	Women or their newborns who require further care are referred without delay	425(73.0)	157(26.9)	4.13	2.32
8.	All women and their newborns are treated equally	447(76.8)	135(23.1)	4.06	1.10
Average		82.23%	17.77%	4.25	

DISCUSSION

Despite the considerable efforts that have been made to improve maternal healthcare, the maternal mortality ratio (MMR) remains unacceptably high. However, quality midwifery is a key to reducing high MMR (5). The findings of this study suggest that the provided midwifery care is of an acceptable level of quality, and it is appropriately in line with the Sudanese definition of quality, which is "providing the best possible patient-centred care using available resources and evidence-based practices." (11). The study's findings that support this suggestion are categorized into three themes – structure, process, and outcomes – to emphasize the strengths and areas for improvement in the field of midwifery, in our area.

In terms of structural elements – equipment, training, and hiring of midwives - our results showed that midwives had almost all the commodities and equipment necessary for providing quality midwifery, with a percentage ranging between 71.8% and 90.7%. The availability of equipment is attributed to several factors, which include: a high level of commitment from the national reproductive health program towards improving midwifery care, and strong collaboration with health partners - UNICEF, WHO, and UNFPA - who are consistently offering technical support and in-kind supplies to the midwifery. The availability of necessary supplies is key in providing quality midwifery care (2). In contrast, in South Sudan, a country with the highest MMR in the world, a study found that insufficient commodities and medical equipment negatively impacted the provision of quality midwifery care (2). Regarding training, about 79.7% of midwives received refresher training after graduation. As a result, the performance of midwives is improved. Interestingly, this finding is in agreement with Cochrane's (12) research findings that advocate the importance of training and qualification in providing high-quality midwifery care. In contrast, a recent study evaluated the impact of training in the SSA study revealed that inadequate midwifery competence contributes significantly to increasing MMR (13). Concerning the recruitment of midwives into the health system, it has been reported that only 148 (50.9%) midwives have been hired. Because it is well known that midwives as healthcare practitioners are less valued than other healthcare professionals (5), being deployed into the health system, on the other hand, makes them more respected and valued. As a result, this will influence their accountability to provide quality maternal care. For this reason and others, the deployment of midwives is becoming an important strategy for reducing high MMR, as recommended by the Lancet series on midwifery (1).

Regarding the process elements of care, first, the result reflects that most midwives have adequate knowledge and skills to provide quality midwifery services. These skills were demonstrated when the midwives asked for a history taken, an obstetric examination, and the ability to identify high-risk pregnancies. This finding could be justified by several reasons: first, a High percentage (79.7%) of those who received refresher training, which makes them more competent in performing their jobs. Second, the financial incentives provided by the national government make the midwives financially secure. Thus, they became more focused and accountable. Interestingly, in many countries with a high MMR remuneration midwives have been recommended to improve maternal care (14). Third, a considerable number (148) of midwives have been employed by the state recently. Fourth, the availability of essential medical equipment. All these factors and more are needed to ensure high-quality maternal healthcare and eventually to achieve the United Nations Sustainable Development Goal 3. This aimed to reduce global maternal deaths to less than 70/100000 LB, with no country having more

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than 140 maternal deaths per 100000 LB (15). In terms of supervision, only 37% of midwives have been supervised, even though supervision is central to any organization striving to successfully implement and evaluate a quality improvement project. The possible explanations for the low percentage of supervision include limited resources and poor accessibility to healthcare facilities, especially in the rainy season.

In terms of the outcome element of this study, our findings reported that the satisfaction of women with midwifery care is reasonably high (69.34%). This high rate could be explained by the rapid progression of midwifery coverage - 13% in 2015 to 60% or more in 2017 -, educated midwives (20% have a university education), and the commitment of the government towards improving midwifery care services. By contrast, the study reported that 255 out of 582 women were very dissatisfied with family planning methods. This could be due to culturally related concerns. The family planning methods are culturally not accepted by a large number of communities, even if it is accepted, it is the husband's decision (17). That is certainly the case in the study's area. However, a study in India found that family planning plays a critical role in improving maternal care outcomes (18).

LIMITATIONS

This study has some limitations. First, it uses the role-play technique to assess midwifery performance instead of direct supervision, which is difficult, if not impossible. The disadvantages of this technique include that it needs skilled facilitators and may result in some participant anxiety, which might affect their engagement with the assessment process. Second, for assessing the level of women's satisfaction, the two categories (satisfied & dissatisfied) were used. Those who reported neutral were considered dissatisfied, leading to an increased bias toward dissatisfaction compared to satisfaction responses. Third, the descriptive analysis that we used did not give the association between variables, for example, training and performance.

CONCLUSION

The present study concludes that the quality of midwifery care services is relatively of an acceptable level of quality. Given the fact that the women who received midwifery care services were relatively satisfied. However, some weaknesses in the areas, such as supervision, employment, laboratory, and family planning, were reported. High-quality research focused on reducing maternal death as a primary outcome is needed to generate actionable recommendations and evidence-based strategies to ensure quality midwifery care for all women.

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