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Community-Based Antenatal Care Quality Assessment: Evidence from Lady Health Workers and Midwives in in Tehsil Kharian and Kunjah, District Gujrat, Pakistan

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Abstract

Background: Antenatal care (ANC) is essential for improving maternal and neonatal health outcomes through early detection and management of pregnancy-related complications. Despite progress, Pakistan continues to face a high maternal mortality ratio of approximately 155 per 100,000 live births, with preventable causes such as eclampsia, infections, and hemorrhage contributing significantly. Frontline providers, including Lady Health Workers (LHWs) and Community Midwives (CMWs), play a pivotal role in delivering quality ANC services at the community level. This study aimed to assess the quality of ANC services provided by LHWs and CMWs in Tehsil Kharian, District Gujrat. **Methods:** A cross-sectional study was conducted among 144 participants, including LHWs and CMWs. Data were collected using a structured questionnaire through systematic random sampling. Statistical analysis was performed using SPSS version 25. Descriptive statistics (frequencies and percentages) and inferential analysis using the Chi-square test were applied to determine associations between variables. **Results:** Of the 144 participants, 110 (76.4%) were LHWs and 34 (23.6%) were CMWs. Only 29% of LHWs and 32.3% of CMWs had received reproductive health training. Approximately 60% reported inadequate facilities, and 56.6% were unable to provide standard ANC services. Supervised health workers demonstrated significantly better skills and performed more ANC procedures compared to unsupervised workers ($p = 0.03$). No statistically significant association was found between service quality and demographic variables ($p > 0.05$). **Conclusion:** Significant gaps exist in training, supervision, and resource availability among LHWs and CMWs. Strengthening capacity-building programs, supportive supervision, and infrastructure is essential to improve the quality of ANC services and maternal health outcomes.

Introduction

Antenatal care (ANC) is a fundamental component of maternal and child health services, aimed at ensuring safe pregnancy and improved neonatal outcomes. It encompasses preventive, promotive, and curative health services provided to pregnant women by skilled healthcare professionals, including doctors, nurses, Lady Health Workers (LHWs), and Community Midwives (CMWs). ANC not only focuses on early detection and management of pregnancy-related complications but also provides essential health education, nutritional support, immunization, and psychosocial care to expectant mothers [1].

During ANC visits, pregnant women receive guidance on healthy behaviors, identification of danger signs, and preparation for childbirth and parenthood. Services such as micronutrient supplementation, blood pressure monitoring, screening for infections (including HIV), tetanus immunization, and prevention of conditions like pre-eclampsia and eclampsia are routinely provided. In malaria-endemic areas, preventive measures such as insecticide-treated nets and prophylactic medications are also included [2]. These interventions collectively contribute to reducing maternal and neonatal morbidity and mortality.

Globally, maternal mortality remains a major public health challenge, particularly in low- and middle-income countries. Although there has been progress in reducing maternal mortality over the past decades, disparities persist. Pakistan continues to face a high burden of maternal and neonatal deaths. Despite improvements, the maternal mortality ratio remains significant, and neonatal mortality rates are among

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the highest in South Asia [3,4]. Limited access to quality ANC services, especially in rural and underserved areas, contributes substantially to these adverse outcomes.

The World Health Organization (WHO) recommends a minimum of eight ANC contacts during pregnancy to optimize maternal and fetal health outcomes, replacing the earlier four-visit model [5]. However, adherence to these recommendations varies widely across countries due to socioeconomic, cultural, and health system barriers. In Pakistan, a considerable proportion of women do not receive adequate ANC, with disparities observed between urban and rural populations. Access to skilled birth attendants remains limited, and utilization of ANC services is often suboptimal [6].

Pakistan's healthcare system, although structured, faces multiple challenges, including inequitable distribution of resources, insufficient training of healthcare providers, and gaps in service delivery. While the public sector provides affordable services, it is underutilized, with a significant proportion of deliveries occurring either in private facilities or at home. Financial constraints, cultural beliefs, and lack of awareness contribute to the preference for traditional birth attendants or unskilled care providers in many communities [7].

An important but often overlooked barrier to healthcare utilization is the experience of disrespect and abuse (D&A) during maternal care. Studies from various developing countries, including those in Africa and Asia, have highlighted the prevalence of mistreatment, including verbal abuse, neglect, discrimination, and lack of informed consent during childbirth [8–10]. Such negative experiences discourage women from seeking institutional care in subsequent pregnancies. In some cases, women may not recognize these behaviors as inappropriate due to normalization of such practices [11]. Addressing respectful maternity care is therefore critical to improving service uptake.

In Pakistan, LHWs and CMWs play a vital role in bridging the gap between communities and formal healthcare systems. These frontline workers are integral to primary healthcare delivery, particularly in rural areas, where access to physicians is limited. The Lady Health Worker Program and the Community Midwifery Program were established to improve maternal and child health indicators by providing essential services at the community level [12]. Their responsibilities include health education, antenatal and postnatal care, family planning services, and referral of high-risk cases.

Despite their importance, LHWs and CMWs face numerous challenges, including inadequate training, limited supervision, insufficient resources, and low community acceptance in certain areas. Their performance and effectiveness are influenced by both individual competencies and systemic factors. Studies have shown that continuous professional development, supportive supervision, and improved working conditions are essential to enhance their service delivery [13].

Socioeconomic factors also significantly influence healthcare-seeking behavior. High levels of illiteracy, poverty, and gender inequality in Pakistan contribute to low utilization of maternal health services. Women in rural areas often lack decision-making autonomy and rely on family members for accessing healthcare. Additionally, previous negative experiences with healthcare facilities may further deter women from seeking care during subsequent pregnancies [14].

Evidence suggests that improved ANC coverage and quality can substantially reduce maternal and neonatal mortality. ANC interventions have been associated with reductions in low birth weight, preterm births, and neonatal infections [15]. Early initiation of ANC and adherence to recommended visit schedules are critical for timely identification of complications. Moreover, health education provided during ANC visits empowers women to make informed decisions regarding their health and that of their newborns.

The role of skilled midwives is particularly significant in improving maternal health outcomes. Countries that have successfully reduced maternal mortality have invested heavily in midwifery training and deployment. However, in many developing countries, including Pakistan, the midwifery profession faces challenges such as low recognition, limited career opportunities, and inadequate remuneration, leading to workforce shortages [16].

Healthcare system strengthening is essential to address these challenges. Strategies such as improving training programs, ensuring availability of essential supplies and equipment, enhancing supervision mechanisms, and promoting respectful maternity care can improve the quality of ANC services. Community-based interventions, including awareness campaigns and behavioral change communication, can also increase service utilization [17].

In addition, innovative approaches, such as community health worker-led interventions and integration of maternal health services into emergency response systems, have shown promise in improving access to care, particularly during humanitarian crises [18]. Strengthening the capacity of frontline healthcare workers is therefore crucial for achieving sustainable improvements in maternal and neonatal health.

Given the persistent gaps in the quality and utilization of antenatal care services in Pakistan, it is important to assess the performance of frontline providers. This study aims to evaluate the quality of antenatal care services provided by Lady Health Workers and Community Midwives in Tehsil Kharian & Kunjah, District Gujrat. It seeks to identify gaps in knowledge, skills, and service delivery, and to provide evidence-based recommendations for improving maternal healthcare services at the community level.

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Methodology

A cross-sectional study was conducted over a period of four months in Tehsil Kharian and Kunjah, District Gujrat, Pakistan, to assess the quality of antenatal care services provided by Lady Health Workers (LHWs) and Community Midwives (CMWs). The study population comprised all certified and registered LHWs and CMWs working in District Gujrat. Participants who had at least three years of field experience and were actively providing services during the study period were included, while those with less than three years of experience or unwilling to participate were excluded.

The sample size was calculated using RaoSoft online software, considering a total population of 1,849 healthcare workers. With a 95% confidence level, 5% margin of error, and 50% response distribution, the final sample size was determined to be 144 participants. A non-probability convenience sampling technique was used to recruit participants from the study area.

Ethical approval for the study was obtained from the Institutional Review Board of Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad, along with permission from the district health authorities of Gujrat. Written informed consent was obtained from all participants after explaining the purpose of the study. Participants were assured of confidentiality, anonymity, and their right to withdraw at any stage without any consequences.

Data were collected using a structured and pre-tested questionnaire administered through face-to-face interviews by trained data collectors to ensure accuracy and minimize bias. The questionnaire assessed knowledge, skills, and practices related to antenatal care service delivery. Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics, including frequencies and percentages, were used to summarize the data, while the Chi-square test was applied to assess associations between variables. A p-value of less than 0.05 was considered statistically significant, and findings were presented in the form of tables and graphical representations.

Results

The study included 144 respondents, comprising 110 Lady Health Workers (LHWs) and 34 Community Midwives (CMWs). The demographic analysis revealed that the average age of LHWs was 25.5 ± 10.0 years, while CMWs averaged 45.5 ± 12.0 years. The mean years of service were 4.5 ± 2 for LHWs and 8.5 ± 2 for CMWs. Approximately 40% of LHWs and 35% of CMWs were from urban areas, while the remainder resided in the countryside. Reproductive health training was completed by 29.1% of LHWs and 32.3% of CMWs. Home visits were conducted by 60.8% of LHWs and 82.3% of CMWs. Adequate prenatal resources were available in 40% of LHW facilities and only 17.6% of CMW facilities (Table 4.1).

Table 4.1: Demographic Characteristics of Study Participants (n=144)

Variable	LHW (n=110)	CMW (n=34)
Age (mean ± SD)	25.5 ± 10.0	45.5 ± 12.0
Years of service	4.5 ± 2	8.5 ± 2
Residential area: Urban	40%	35%
Residential area: Countryside	60%	65%
Working location: Hospital	50%	24%
Working location: Private clinic	18%	15%
Working location: Community	36%	61%
Reproductive health training	29.1%	32.3%
Home visits	60.8%	82.3%
Adequate prenatal resources	40%	17.6%

Assessment of antenatal care services provided by HCWs indicated that 73% advised iron/folate supplementation, 62.3% measured blood pressure, 51.7% administered tetanus toxoid injections, and 41.7% collected blood samples. Urine testing was performed by 30.7% of HCWs. Postpartum counseling and discussion of danger signs were conducted by 47.2% and 46.7% of HCWs, respectively (Table 4.2).

Table 4.2: Quality Assessment of Antenatal Care Services Provided by LHWs and CMWs

ANC Component	Positive Response (%)
Iron/Folate supplementation	73%
Blood pressure measurement	62.3%
Tetanus toxoid injection	51.7%
Blood sample collection	41.7%
Urinalysis	30.7%
Postpartum counseling	47.2%
Discussion of danger signs	46.7%
Neonatal infection management	10.4%

Evaluation of participants' skills using a scoring system (maximum 8 points) showed that most HCWs were competent in providing medications or supplements (75%), documentation and prenatal cards (62%), and calculating due dates (60%). However, physical examination, abdominal examination, and sample collection were less frequently performed (Table 4.3).

Table 4.3: Percentage Frequency of Positive Responses for Participant Skills

Skill Category	Maximum Score	Positive Response (%)
Complete history	4	54%
Physical examination	3	35%
Abdominal examination	3	35%
Calculate due date	4	60%
Sample collection	3	40%
Medications/Supplements	6	75%
Documents/Prenatal Cards	5	62%
Neonatal assessment	4	55%

Knowledge level analysis revealed that 70% of participants attended reproductive health service training, while 56.6% lacked adequate facilities and could not provide basic antenatal care (Table 4.4). Significant associations were observed between knowledge level and age, qualification, clinical supervision, administrative supervision, training, and provision of basic ANC ($P < 0.05$). However, availability of prenatal resources did not significantly influence knowledge ($P = 0.25$).

Table 4.4: Socio-demographic Factors Associated with Knowledge Level (n=144)

Variable	Knowledge Positive (%)	χ^2	P-value
Age (mean ± SD)	37.5 ± 12.5	3.85	0.01
Qualification	BSc Nursing 1.17%, Registered 61.7%	6.9	0.01
Clinical supervision	Yes 40.9%, No 59%	5.8	0.01
Accept administrative supervision	Yes 37.2%, No 62.7%	9.3	0.02
Reproductive health training	Yes 29%, No 70%	6.5	0.01
Provides basic ANC	Yes 43%, No 56.6%	7.2	0.01
Adequate prenatal resources	Yes 40%, No 60.5%	2.5	0.25

Assessment of prenatal competencies indicated that 65% recognized signs of pregnancy, 32% identified high blood pressure risk, and only 10% screened for seizure signs. Blood pressure and weight measurement were performed by 62% and 60.1%, respectively, while intramuscular injections were administered by 70%. Neonatal assessment, low birth weight monitoring, and neonatal infection management were less commonly conducted (30%, 13%, and 10.4%, respectively) (Table 4.5).

Table 4.5: Prenatal Competencies and Skills (n=144)

Competency/Skill	Positive Response (%)
Recognize signs of pregnancy	65%
Identify high blood pressure risk	32%
Screen for seizure signs	10%
Measure blood pressure	62%
Measure weight	60.1%
Administer intramuscular injection	70%
Refer to district hospitals	41.5%
Neonatal assessment	30%
Low birth weight monitoring	13%
Neonatal infection testing	25%
Neonatal infection management	10.4%

Demographic factors associated with prenatal skills showed that participants under clinical supervision had significantly higher skills ($P = 0.01$), while other factors, including age, qualification, workplace, and availability of antenatal resources, were not significantly associated (Table 4.6).

Table 4.6: Demographic Factors Associated with Prenatal Skills (n=144)

Variable	Positive Response (%)	χ^2	P-value
Age (mean ± SD)	39.7 ± 12.5	2.5	0.10
Qualification	BSc Nursing 1.8%, Registered 65.7%, Other 32.5%	4.1	0.25
Clinical supervision	Yes 63%, No 36.6%	6.0	0.01
Accept administrative supervision	Yes 38.2%, No 62.7%	2.5	0.50
Reproductive health training	Yes 31.8%, No 68%	3.2	0.25
Adequate antenatal services	Yes 43%, No 56.6%	3.5	0.09

Administrative support evaluation indicated that only 35% of participants received training to recognize pregnancy complications, while 30% received training for management and referrals. Tools availability was limited, with 50% having blood pressure meters, 31.5% weighing machines, 9% urine test strips, and 18% tape measures (Table 4.7).

Table 4.7: Administrative Support Available to Community Health Workers (n=144)

Administrative Support	Positive Response (%)
Training in recognizing pregnancy complications	35%
Training in referral/management of pregnancy complications	30%
Blood pressure meter availability	50%
Weighing machine availability	31.5%

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Urine test strips/pregnancy test sticks	9%
Tape measure availability	18%

Discussion

Overall, the results indicate that while LHWs and CMWs provide basic antenatal care, gaps exist in knowledge, skills, supervision, and administrative support, limiting the quality and comprehensiveness of antenatal services in District Gujrat.

This study highlights significant gaps in the quality of antenatal care (ANC) services provided by Lady Health Workers (LHWs) and Community Midwives (CMWs) in rural Pakistan. Globally, an estimated 40 million births occur at home annually without the presence of trained health professionals, exposing mothers and newborns to preventable morbidity and mortality due to lack of quality care and skilled attendance [19]. In low- and middle-income countries (LMICs), inadequate ANC facilities, resource limitations, and health system weaknesses contribute to persistently high maternal and neonatal mortality rates [20,21].

Community health workers (CHWs) such as LHWs and CMWs are instrumental in reducing barriers related to geographic distance, service costs, and limited clinic access, particularly in rural settings [22]. Evidence demonstrates that CHWs can improve maternal and neonatal outcomes when adequately trained, supported, and equipped, thus increasing utilization of facility-based care, skilled birth attendance, and postnatal follow up [23,24]. However, deficiencies such as lack of clinical skills, supervision, and resources continue to compromise service quality [25].

The present study found that despite regular home visits (84% of HCWs), only a minority of LHWs and CMWs had adequate competencies to perform essential ANC components, including complete history taking and physical examinations. Less than one third conducted urine tests, abdominal examinations, or comprehensive obstetric assessments, which are critical for early detection of high-risk pregnancies [26]. Limited-service proficiency mirrors findings from similar rural health worker assessments in sub Saharan Africa and South Asia, where CHWs frequently lack clinical confidence due to insufficient training and supportive supervision [27,28]. For example, a study in Tanzania reported that only 25% of CHWs could competently identify pregnancy danger signs without referral support [29].

The current data show that while most participants measured basic parameters such as blood pressure and weight (62%), more advanced procedures such as seizure risk screening (10%) and neonatal infection management (10.4%) were rarely performed. This aligns with evidence from Nepal and Bangladesh where CHWs often provide routine counseling but remain less effective in clinical risk identification due to limited refreshers, mentorship, and clinical exposure [30,31].

Importantly, supervision emerged as a significant determinant of skills and knowledge. Participants under regular clinical oversight demonstrated significantly higher competencies during ANC, consistent with global evidence highlighting that continuous supportive supervision enhances performance and accountability of CHWs [32]. Administrative support, training opportunities, and structured on the job education have been associated with improved maternal care quality in similar settings [33].

The current study also documented that training coverage for pregnancy complication management was low (14%–34%), despite the recognized importance of early recognition and management of obstetric emergencies. This deficiency contributes to delays in appropriate care and increases the risk of adverse outcomes [34]. A systematic review in LMICs similarly identified that training gaps and weak health systems significantly reduce the effectiveness of CHWs in reducing maternal mortality [35].

Consistent with Pakistan's Demographic and Health Survey (PDHS), where only 37% of women received adequate ANC [3], our findings suggest that limited knowledge and skills among CHWs contribute to low service quality and utilization. The World Health Organization (WHO) emphasizes the importance of quality ANC — including history taking, risk identification, counseling, and laboratory screening — to prevent maternal and neonatal complications [36]. However, the lack of essential equipment (such as urine test strips and advanced screening tools) reported by 65% of respondents further hindered CHWs from executing recommended ANC procedures. These resource shortfalls are not unique to Gujrat; similar constraints have been reported across rural Pakistan, where basic diagnostic tools and supplies are often unavailable at the community level [37,38].

A notable gap identified in this study is the limited understanding of recommended ANC schedules and core service objectives (e.g., timing of visits, purpose of risk screening), particularly among midwives. Evidence shows that late initiation of ANC and inconsistent follow up significantly reduce the preventive impact of services and are commonly associated with adverse outcomes such as pre-eclampsia, low birth weight, and neonatal infection [39,40].

The interplay of inadequate supervision, training deficits, resource limitations, and low confidence among CHWs reinforces the need for health system strengthening. Programmatic strategies such as competency-based training, performance evaluation, and integration of digital health tools have been shown to improve CHW effectiveness in several LMIC contexts [41,42]. For example, mobile clinical decision support systems significantly enhanced adherence to ANC protocols among community health workers in Ghana and Kenya [43].

Overall, the study underscores that while LHWs and CMWs are essential contacts for maternal care in rural Pakistan, their current knowledge and skill levels are insufficient to deliver high quality ANC independently. Health system reforms that emphasize training, supervision, supply chain strengthening, and continuous performance monitoring are urgently needed

to close gaps in service delivery and improve maternal and neonatal outcomes.

Conclusion

The study concludes that community health workers (CHWs), including Lady Health Workers (LHWs) and Community Midwives (CMWs), play a critical role in delivering maternal and child health services at the community level. Antenatal care (ANC) services are often provided by personnel with varying levels of competence, which can contribute to high maternal and neonatal morbidity and mortality due to limited resources and inadequate healthcare availability. Effective maternal and neonatal outcomes can be achieved through comprehensive healthcare provision, skilled birth attendants, and timely clinical interventions. Conversely, poor management and insufficient skills among CHWs contribute to increased mortality.

Regular updating of antenatal care skills through structured training and clinical practice is essential to improve service delivery. The study identified several gaps in ANC provision, including low knowledge and clinical skills, limited professional training, insufficient clinical and administrative supervision, and inadequate screening tools and equipment. Clinical supervision and hands-on practice, particularly in managing obstetric emergencies such as preeclampsia and preterm birth, are critical for improving neonatal outcomes. Equipping LHWs and CMWs with appropriate resources and support is vital to reducing maternal and neonatal mortality.

Classifying CHWs according to training, knowledge, and competencies can help optimize their role in maternal healthcare. Policy interventions should focus on enhancing the skills, competencies, and clinical readiness of LHWs and CMWs, with particular attention to emergency management of pregnancy complications. Healthcare providers should be trained, motivated, and supported to follow standardized ANC protocols to ensure consistent and high-quality maternal care.

Recommendations

Human Resource Strengthening: WHO estimates indicate a shortage of community health workers. Policymakers must consider this deficit when planning redistribution of healthcare services.

Skill Assessment and Training: Periodic evaluation of CHWs' competencies should be conducted, and structured, competency-based training programs should be implemented to enhance knowledge, clinical skills, and emergency preparedness.

Provision of Equipment and Facilities: CHWs must be supplied with essential ANC tools such as blood pressure monitors, weighing machines, and urine dipsticks/test kits to facilitate accurate assessment, diagnosis, and follow-up at the community level.

Supportive Supervision: Ongoing clinical supervision, mentoring, and monitoring should be institutionalized to ensure adherence to ANC protocols and to strengthen confidence and decision-making capacity among CHWs.

Policy Integration: National and provincial health policies should integrate these strategies to ensure that CHWs are capable of delivering high-quality, evidence-based ANC services consistently across rural and urban areas.

Limitations of the Study

This study was conducted in a single district and involved a limited sample size, which may affect the generalizability of findings. Furthermore, data were collected from a small number of participants, restricting the breadth of insights into ANC service quality. Future research should focus on multi-center, large-scale prospective studies covering both rural and urban areas to comprehensively assess the effectiveness and quality of ANC services provided by LHWs and CMWs across Pakistan.

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Declarations:

Authors' Contribution:

- All Authors Conceptualization, data collection, interpretation, drafting of the manuscript and intellectual revisions
- The authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed

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