Health facility factors associated with targeted postnatal care implementation in health facilities across Kakamega County, Western Kenya

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ABSTRACT

The postnatal period is a critical window for reducing maternal and neonatal morbidity and mortality; however, the quality and completeness of postnatal care remain suboptimal in many low- and middle-income countries. Targeted postnatal care (TPNC), as recommended by the World Health Organization, emphasizes structured, timely, and comprehensive interventions for both the mother and newborn. Despite increased facility-based deliveries in Kenya, gaps persist in the implementation of recommended postnatal care interventions, particularly at the facility level. This study aimed to assess facility factors influencing the implementation of TPNC in selected health facilities in Kakamega County, Kenya. A descriptive and analytical cross-sectional study was conducted among 160 midwives in selected public health facilities. Data were collected using structured interviewer-administered questionnaires and facility assessment checklists. Quantitative data were analyzed using SPSS version 25. Descriptive statistics summarized facility characteristics and levels of TPNC implementation, while linear regression analysis was used to determine the influence of facility-level factors. Statistical significance was set at $p < 0.05$. The results showed that facility capacity factors significantly influenced TPNC implementation ($F(7,2)=27.36$, $p=0.038$, $R^2=0.99$). Availability of essential equipment, drugs, and supplies ($B=0.58$, $p=0.026$), as well as capacity for laboratory services ($B=0.48$, $p=0.014$), were positively associated with improved implementation. Similarly, management and staffing factors significantly predicted TPNC implementation ($F(9,150)=14.67$, $p<0.0001$, $R^2=0.467$), with the number of midwives providing services ($B=7.14$, $p=0.001$) and supportive supervision with feedback ($B=5.50$, $p=0.003$) emerging as key determinants. It was concluded that high workload and space inadequacy were not statistically significant predictors. This study recommended that strengthening health facility capacity through improved resource allocation, workforce optimization, and enhanced supervision mechanisms is essential to improve adherence to postnatal care guidelines and maternal–newborn outcomes.

Keywords: Health Facility Factors, Targeted Postnatal Care, Kakamega County, Western Kenya

I. INTRODUCTION

The postnatal period is a critical phase in the continuum of maternal and newborn care, during which a substantial proportion of maternal and neonatal morbidity and mortality occurs. Globally, more than half of maternal deaths and the majority of neonatal deaths occur within the first days and weeks after childbirth, largely due to preventable causes such as hemorrhage, sepsis, and birth-related complications (World Health Organization, 2022; UNICEF, 2021). Despite increased facility-based deliveries in many low- and middle-income countries, improvements in postnatal outcomes have lagged behind, highlighting persistent gaps in the quality and completeness of postnatal care services (Sacks et al., 2022). Targeted postnatal care (TPNC), as recommended by the World Health Organization, provides a structured package of interventions delivered at specific time points to ensure early detection and management of complications, promote healthy practices, and support maternal and newborn well-being (World Health Organization, 2022).

In Kenya, national guidelines aligned with World Health Organization recommendations outline a schedule of postnatal visits within 48 hours, 1–2 weeks, 4–6 weeks, and up to 6 months postpartum, each with defined interventions for both the mother and the newborn (Ministry of Health Kenya, 2017). However, evidence from national surveys indicates that while coverage of postnatal visits has improved, the content and quality of care remain suboptimal, with many women and newborns not receiving the full package of recommended interventions (Kenya National Bureau of Statistics et al., 2023). Studies have shown low levels of assessment for danger signs, inadequate counselling, and inconsistent provision of essential services such as breastfeeding support and family planning (Adams et al., 2020; Kawuki et al., 2020). These gaps suggest that increasing access alone is insufficient and that greater attention must be paid to the quality of care delivered within health facilities.

Health facility factors play a central role in shaping the implementation of postnatal care. According to the Donabedian Model, the structure and organization of health services including infrastructure, human resources, availability of equipment and supplies, and management systems directly influence care processes and ultimately health outcomes (Donabedian, 1988). In many low-resource settings, facility-level constraints such as inadequate staffing, high workload, insufficient supplies and essential drugs, and poor infrastructure limit the ability of healthcare providers to adhere to recommended care standards (Kebede et al., 2021; Yevoo et al., 2020). Additionally, weak systems for supervision, lack of functional guidelines, and poor organization of maternity and postnatal units further contribute to inconsistent implementation of postnatal care interventions (Namutebi et al., 2023).

Empirical evidence from sub-Saharan Africa supports the significant influence of facility-level determinants on postnatal care quality. Studies have reported that shortages of skilled personnel and unfavorable staff-to-patient ratios often lead to omission of essential assessments and delayed care (Kemei et al., 2021; Kebede et al., 2021). Similarly, lack of essential equipment and supplies has been associated with incomplete clinical examinations and poor monitoring of mothers and newborns (Yevoo et al., 2020). The organization of care within facilities, including separation of maternity units and inadequate continuity between delivery and postnatal services, has also been shown to hinder effective follow-up and timely interventions (Namutebi et al., 2023). Furthermore, the absence of supportive supervision and accountability mechanisms reduces adherence to clinical guidelines and limits opportunities for quality improvement (Kisakye et al., 2017).

In Kakamega County, Kenya, maternal and neonatal mortality remains high despite relatively high facility delivery rates, suggesting persistent gaps in the quality of care provided during the postnatal period (Kenya Health Information System, 2022). Although previous studies have explored individual-level and maternal factors influencing postnatal care utilization, there is limited empirical evidence examining how facility-level factors affect the implementation of targeted postnatal care interventions. Understanding these factors is essential for designing context-specific interventions aimed at improving the quality, consistency, and effectiveness of postnatal services. Therefore, this study sought to assess facility factors influencing the implementation of targeted postnatal care in selected health facilities in Kakamega County, Kenya.

1.1 Statement of the Problem

The postnatal period remains a critical phase in the continuum of maternal and newborn care, with a substantial proportion of maternal and neonatal morbidity and mortality occurring within the first days following childbirth (World Health Organization [WHO], 2022; United Nations Children's Fund [UNICEF], 2021). Although Kenya has made progress in increasing facility-based deliveries and has adopted evidence-based guidelines for targeted postnatal care (TPNC), the quality and completeness of postnatal care services remain suboptimal. Essential components such as maternal danger sign assessment, laboratory investigations, and health education are often inconsistently implemented within health facilities, limiting the potential impact of these interventions on maternal and neonatal outcomes (Kawuki et al., 2020; Sacks et al., 2022). This gap between policy and practice highlights persistent challenges in the effective delivery of postnatal care services.

While previous studies have explored individual and community-level determinants of postnatal care utilization, there is limited empirical evidence on the role of health facility factors in shaping the implementation of TPNC in Kenyan settings. Facility-level elements such as availability of equipment and supplies, staffing capacity, workload, and management support are likely to influence the ability of healthcare providers to deliver comprehensive postnatal care. However, the extent to which these factors affect TPNC implementation in health facilities across Kakamega County remains poorly understood. Addressing this gap is essential for informing health system strengthening interventions aimed at improving the quality, consistency, and effectiveness of postnatal care services and ultimately enhancing maternal and newborn health outcomes.

1.2 Research Objective

1.2.1 Broad Objective

To assess the health facility factors associated with the implementation of targeted postnatal care (TPNC) in health facilities across Kakamega County, Western Kenya.

1.2.2 Specific Objectives

1. To determine the level of implementation of targeted postnatal care (TPNC) in selected health facilities in Kakamega County.
2. To examine the influence of facility capacity factors, staffing and workload (on the implementation of targeted postnatal care.
3. To evaluate the effect of management and support on TPNC implementation.

II. LITERATURE REVIEW

2.1 Theoretical Literature Review

The implementation of targeted postnatal care (TPNC) can be conceptualized using the Donabedian Quality of Care Model, which categorizes healthcare quality into structure, process, and outcomes (Donabedian, 1988). In this framework, facility-level factors such as infrastructure, availability of supplies, staffing levels, and organizational support represent the structural components of care. These structural elements directly influence care processes, including clinical assessments, counselling, and adherence to postnatal care guidelines. Ultimately, the effectiveness of these processes determines maternal and neonatal health outcomes. In the context of this study, inadequate facility capacity—such as shortages of equipment, drugs, or personnel—can disrupt care processes and lead to incomplete implementation of TPNC interventions.

In addition, the concept of implementation fidelity provides a useful lens for understanding variations in the delivery of postnatal care across health facilities. Implementation fidelity refers to the extent to which an intervention is delivered as intended (Carroll et al., 2007). Within health facilities, fidelity to postnatal care guidelines depends not only on provider competence but also on enabling factors such as supportive supervision, availability of resources, and organizational systems. Facilities with strong management support, clear protocols, and adequate resources are more likely to achieve high fidelity in implementing TPNC. Conversely, constraints such as high workload, limited staffing, and inadequate infrastructure may lead to partial or inconsistent implementation. Together, the Donabedian model and implementation fidelity theory provide a comprehensive framework for understanding how facility-level factors influence the implementation and effectiveness of targeted postnatal care.

2.2 Empirical Literature Review

Empirical evidence indicates that health facility factors are central determinants of the quality and implementation of postnatal care services in low- and middle-income countries. Facility readiness—including the availability of essential equipment, drugs, supplies, and laboratory services—has been consistently associated with improved adherence to postnatal care guidelines. For example, Bune et al. (2023) found that healthcare providers working in facilities with adequate resources were significantly more likely to implement immediate postnatal care protocols. Similarly, Yevoo et al. (2020) reported that shortages of essential supplies and diagnostic capacity in Ghana led to incomplete clinical assessments and reliance on improvisation, thereby compromising the quality of care. These findings suggest that even when providers are trained, the absence of adequate facility resources can limit their ability to deliver comprehensive targeted postnatal care (TPNC).

In addition to infrastructure and supplies, staffing levels and workload have been identified as critical facility-level determinants of postnatal care implementation. Evidence from Kenya and other sub-Saharan African countries indicates that high patient loads and inadequate staffing contribute to missed opportunities for care, particularly for preventive and counselling interventions (Kemei et al., 2021; Phiri & Bhengu, 2023). Furthermore, studies have shown that facilities with a higher number of skilled personnel are better able to provide timely and comprehensive postnatal services. Supportive supervision and management practices also play a key role; Kisakye et al. (2017) demonstrated that structured supervision and feedback mechanisms significantly improved maternal and newborn care practices in Uganda. Similarly, Namutebi et al. (2023) found that midwives working in environments with regular mentorship and clear guidelines were more likely to adhere to recommended postpartum care practices.

Broader empirical literature highlights that health system organization and governance factors further influence the implementation of postnatal care. A systematic review by Yihune Teshale et al. (2025) identified facility-level barriers such as weak supervision systems, inadequate infrastructure, and poor coordination of services as major constraints to maternal healthcare delivery in East Africa. Likewise, Khatri et al. (2021) reported that the quality of maternal health services, including postnatal care, is strongly influenced by service readiness and organizational capacity within health facilities. These findings underscore the importance of strengthening facility-level systems to ensure consistent and effective delivery of targeted postnatal care interventions.

III. METHODOLOGY

3.1 Study Design

A cross-sectional analytic quantitative study was conducted to assess facility-level factors influencing the implementation of targeted postnatal care (TPNC) in selected health facilities in Kakamega County, Kenya. The **design** was considered appropriate for this study as it enabled the assessment of the relationship between health facility factors and the implementation of targeted postnatal care (TPNC) at a single point in time. This design is particularly suitable for examining associations between multiple independent variables such as facility capacity, staffing levels, and

management support and a defined outcome, in this case the level of TPNC implementation, within real-world service delivery settings. Given the study objective was to identify factors associated with variations in implementation rather than to establish causality, the cross-sectional approach provided an efficient and practical means of generating relevant evidence.

3.2 Study Setting

The study was carried out in selected public health facilities in Kakamega County, western Kenya. The county has a high burden of maternal and neonatal morbidity and mortality and comprises a network of referral, sub-county, and primary-level facilities providing maternal and newborn services. These facilities vary in terms of infrastructure, staffing, and service capacity, making them suitable for assessing facility-level determinants of care implementation.

3.3 Study Population

The study population were midwives providing care at postnatal clinics in the selected facilities during the study period

3.3.1 Eligibility Criteria

Inclusion Criteria: Midwives actively involved in postnatal care provision in selected facilities. Health facilities offering routine postnatal care services. Participants who provided written informed consent. *Exclusion Criteria:* Midwives not directly involved in postnatal care or absent during data collection. Facilities not providing postnatal care services

3.4 Sample Size and Sampling Procedure

A sample size of 160 midwives calculated from a definite sample of 256 midwives in the selected health facilities in Kakamega County. The sample size was determined using the Probability Proportionate to Population Size (PPS) was used as described by the World Health Organization (Lwanga & Lemeshow, 1991). N=256 was the total number of midwives in the selected health facilities.

$$n = \frac{Z^2 pq}{n}$$

Where;

n= the required minimum sample size

p= estimated proportion of the target population who have the characteristics being measured

q=1-p

d=level of statistical significance sat at +or – 5% or 0.05

z=SD corresponding to 95% or Confidence level=1.96

$$n = \frac{(1.96)^2(0.64)(0.36)}{(0.5)^2}$$

$$n = 354$$

Since the Population (N) is less 10,000, the final sample size (nf) was:

$$nf = \frac{n}{1+n/N}$$

$$nf = \frac{354}{1 + (\frac{354}{256})}$$

nf ***=145***

10% was added for non-response:

145×0.1= 14.5=15

Therefore, the final sample size was:

n=145+15 = **160 midwives**

The study employed multistage sampling. Facilities were clustered according to KEPH levels. Kakamega County Referral Hospital (KCTRH) was purposively selected due to the fact that it is the only level five in the county and the major referral facility, Level 4 facilities were selected due to high workload and referral facilities for levels 2 and 3. Then proportionate allocation of participants across selected facilities was done. Finally, random sampling of midwives within facilities

Table 1

Proportion of sample population from the selected facilities

Facility name	Type of facility	Number of midwifes
1.Kakamega County Referral Hospital	5	43
2.Likuyani hosp	4	13
3.lumakanda hos	4	12
4.Malava hosp	4	20
5.Navakholo hosp	4	10
6.Iguhu hosp	4	11
7.Makunga hosp	4	9
8.Mumias level 4 hosp	4	10
9.Matungu hosp	4	14
10.Butere hosp	4	18
TOTAL		160

3.5 Data Collection Procedures

Data were collected using structured interviewer-administered questionnaires from midwives. Facility assessment checklists to evaluate infrastructure, equipment, supplies, staffing, and availability of guidelines. Research assistants were trained on study procedures, ethical considerations, and tool administration prior to data collection. The tools were pretested in similar facilities and refined accordingly. Data collection was conducted after obtaining permission from relevant authorities and written informed consent from participants.

The dependent variable was the implementation of targeted postnatal care (TPNC), measured based on the proportion of recommended postnatal care interventions delivered at scheduled visits in accordance with national guidelines (Ministry of Health Kenya, 2017). The independent variables included key health facility factors: infrastructure (availability of space and organization of maternity and postnatal units), human resources (staffing levels and staff-to-patient ratios), availability of essential equipment for maternal and newborn care, availability of supplies and drugs, presence and utilization of postnatal care guidelines and protocols, and the frequency and quality of supportive supervision.

3.6 Data Analysis

Quantitative data were analyzed using **SPSS version 25.** Descriptive statistics (frequencies and percentages) summarized facility characteristics and TPNC implementation levels. Linear regression analysis was conducted to identify independent facility-level predictors of TPNC implementation. A p-value of <0.05 was considered statistically significant.

3.7 Ethical Considerations

Ethical approval was obtained from relevant institutional review bodies (MMUST/IERC/183/2023) and regulatory authorities (NACOSTI/P/23/29537). Permission to conduct the study was granted by Kakamega County health authorities and participating facilities. All participants provided written informed consent prior to participation. Confidentiality was maintained by anonymizing data and restricting access to authorized personnel. Participation was voluntary, and participants were free to withdraw at any stage without penalty.

IV. FINDINGS & DISCUSSION

4.1 Finding

4.1.1 Implementation of Postnatal care for the mother at 2-4 weeks postpartum

The mean percentage level of implementation of TPNC interventions during this period was 47.38% with a standard deviation of ±16.58. Majority midwives 80.63% did vital signs with only 46.88% and 6.88% doing a complete physical exam to the mothers and mental assessment respectively, the descriptive analysis findings is as shown in Figure 1.

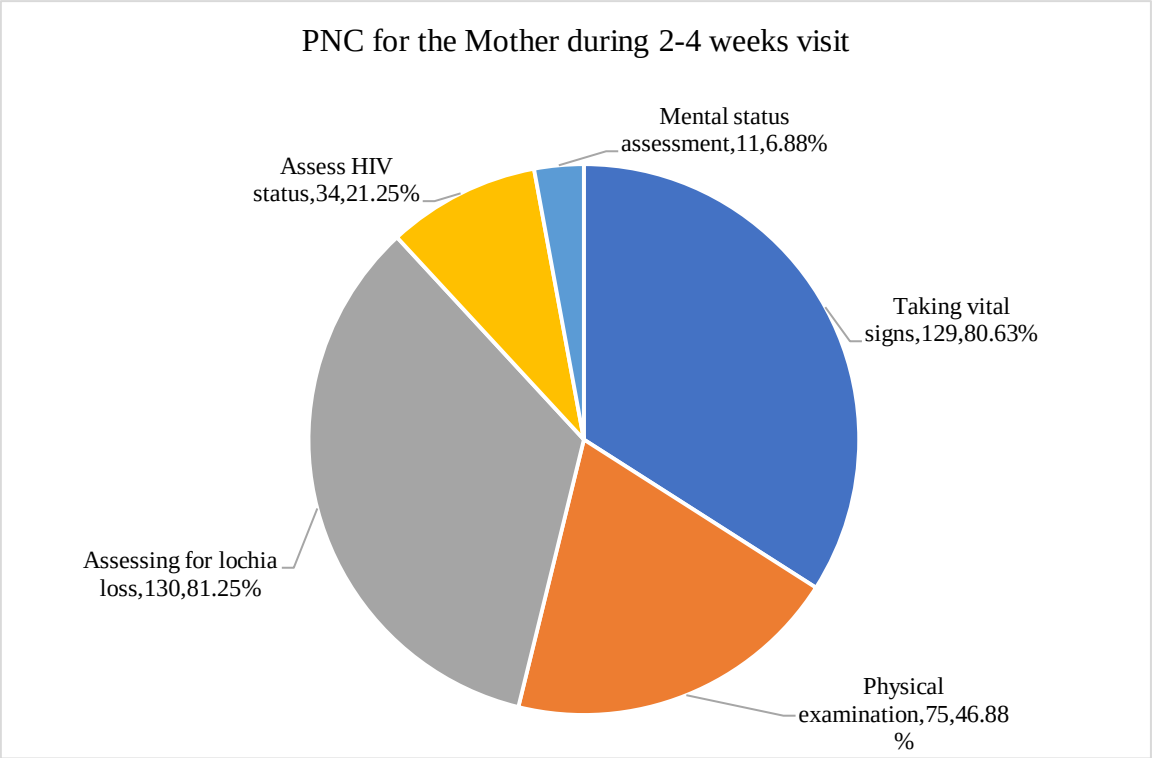

Figure 1
PNC for the Mother during 2-4 Weeks Visit

4.1.2 Facility Factors Associated with TPNC Implementation

The linear regression analysis of facility capacity factors associated with the midwives TPNC implementation revealed some significant associations. The model statistics indicated a significance of the model, ($F(7,2) = 27.36$, $p = 0.038$) with an R2 value of 0.99, suggesting that the model can effectively predict 99% of the variations on midwives TPNC implementation based on facility capacity factors. These findings should be interpreted with caution, as the model may overestimate the strength of association since results were based on 3 facilities included in the study. Percentage capacity for TPNC equipment's, drugs and supplies showed a significant positive association (B: 0.58, 95% CI: 0.17 - 1.00, $t = 6.03$, $p = 0.026$), implying that higher capacity for TPNC equipment, drugs and supplies within the facility is linked to increased midwives TPNC implementation. Likewise, capacity for essential laboratory tests showed a significant positive association (B: 0.48, 95% CI: 0.23 - 0.74, $t = 8.28$, $p = 0.014$). This implies that greater capacity for essential laboratory tests correlates with higher levels of midwives TPNC implementation. This is further detailed in Table 1

Table 1
Facility based factors associated with TPNC implementation.

Facility based factors	B	95% CI	t	P Value
Workload	0.11	-0.01 - 0.23	3.95	0.058
Percentage capacity for PNC equipment, drugs, supplies	0.58	0.17 - 1.00	6.03	**0.026**
Capacity for essential laboratory tests	0.48	0.23 - 0.74	8.28	**0.014**
Level of emergency referrals	0.15	-0.05 - 0.35	3.25	0.083

Linear regression analysis of facility-based factors associated with midwives TPNC implementation of PNC Model statistics F(7,2)=27.36, P=0.038, R^2=0.99, P<0.05, PNC=Postnatal Care

4.1.3 Facility management support and staffing

The linear regression analysis of management support and staffing factors associated with the midwives TPNC implementation revealed some significant associations. The model statistics indicated a significance of the model ($F(9,150) = 14.67$, $p < 0.0001$) with an R^2 value of 0.467, suggesting that the model can effectively predict 46.7% of the variations on midwives TPNC implementation based on management support and staffing. Percentage total number of midwives offering service showed a significant association (B: 7.14, 95% CI: 3.08 - 11.19, t=3.48, P= 0.001) thus

indicating that having a higher number of midwives offering TPNC is associated with a significant increase in TPNC implementation. Support supervision and feedback to midwives significantly enhanced TPNC implementation (B:5.50, 95% CI: 1.89 - 9.11, t=3.01, P= 0.003). High workload (B:-3.42, 95% CI: -7.31 - 0.47, t=-1.74, P= 0.084) and space inadequacy (B: 2.07, 95% CI: -1.42 - 5.57, t=1.17, P= 0.243) equally had no significant association with midwives TPNC implementations as it is further detailed in Table 2.

Table 2

Facility management support and staffing factors associated with midwives TPNC implementation

Management support and staffing	B	95% CI	t	P Value
Number of midwives implement TPNC	7.14	3.08 - 11.19	3.48	**0.001**
Support supervision and feedback to midwives	5.50	1.89 - 9.11	3.01	**0.003**
High workload	-3.42	-7.31 - 0.47	-1.74	0.084
Space inadequacy	2.07	-1.42 - 5.57	1.17	0.243

Linear regression analysis of facility management support and staffing factors associated with midwives TPNC implementation Model statistics F (9,150) =14.67, P<0.0001, R^2=0.467, P<0.05, Dependent variable is Overall PNC, TPNC is targeted postnatal care

4.2 Discussion

This study reports a suboptimal mean implementation of postnatal interventions. The study demonstrates that facility-level factors play a significant role in associated with the implementation of targeted postnatal care (TPNC), with both facility capacity and management-related variables showing strong associations with midwives' performance. The regression model for facility-based factors explained a substantial proportion of variation in TPNC implementation (R^2 = 0.99), highlighting the centrality of structural health system inputs. In particular, the availability of essential equipment, drugs, and supplies, as well as laboratory capacity, were significant predictors of improved TPNC implementation. However, the very small residual degrees of freedom indicate a limited effective sample size relative to the number of predictors (some facilities may have not been considered in the final model), which may raise concerns about model overfitting and the stability of the estimates. Nevertheless, these findings are consistent with existing evidence indicating that the availability of essential resources is a prerequisite for the delivery of quality maternal and newborn care (Kebede et al., 2021; World Health Organization, 2022). According to the Donabedian Model, such structural components directly influence care processes, and the observed associations in this study reinforce the importance of strengthening facility readiness to improve postnatal outcomes.

The significant positive association between availability of equipment, supplies, and laboratory services and TPNC implementation underscores the importance of resource adequacy in ensuring adherence to clinical guidelines. Facilities with better-equipped service delivery environments enable midwives to perform essential assessments, diagnostics, and interventions required during the postnatal period. Similar findings have been reported in Ghana and Ethiopia, where inadequate supplies and diagnostic capacity were linked to incomplete postnatal assessments and missed opportunities for early detection of complications (Yevoo et al., 2020; Kebede et al., 2021). Laboratory capacity, in particular, plays a critical role in supporting clinical decision-making and timely management of maternal and newborn conditions, suggesting that investments in diagnostic infrastructure are essential for improving the quality of postnatal care services.

The findings further indicate that human resource capacity and management support are critical determinants of TPNC implementation. The number of midwives providing services and the presence of supportive supervision and feedback mechanisms were significantly associated with improved implementation. This aligns with previous studies demonstrating that adequate staffing levels and supportive supervision enhance provider performance and adherence to clinical standards (Kisakye et al., 2017; Namutebi et al., 2023). Support supervision not only reinforces adherence to guidelines but also provides opportunities for mentorship, performance feedback, and continuous quality improvement. The strong association of these factors suggests that beyond infrastructure, the organization and management of health services are key drivers of effective postnatal care delivery.

Interestingly, although workload and space inadequacy were not statistically significant predictors, their negative and inconsistent associations suggest that they may still exert indirect effects on care delivery. High workload has been widely documented as a barrier to quality maternal and newborn care, often leading to task prioritization and omission of less urgent but essential interventions such as counselling and health education (Kemei et al., 2021). The lack of statistical significance in this study may reflect contextual variations or interactions with other facility-level factors, such as staffing levels and supervision, which may mitigate the effects of workload. Overall, these findings highlight that improving TPNC implementation requires a comprehensive health systems approach, addressing not only resource availability but also workforce capacity, supervision, and organizational processes within health facilities.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study demonstrates that facility-level factors are key determinants of targeted postnatal care (TPNC) implementation in selected health facilities in Kakamega County. The findings show that the availability of essential equipment, drugs, supplies, and laboratory services significantly enhances midwives' ability to deliver recommended postnatal care interventions. In addition, human resource capacity and supportive management practices—particularly adequate staffing and effective supervision with feedback—were strongly associated with improved implementation. In contrast, individual facility constraints such as workload and space inadequacy were not statistically significant predictors, although they may still influence care delivery indirectly. Overall, the results highlight that structural and organizational health system factors play a more critical role than individual provider characteristics in shaping the quality and consistency of postnatal care.

5.2 Recommendations

To improve the implementation of targeted postnatal care, there is a need for strengthened health system investments at facility level. County and national health authorities should prioritize the consistent provision of essential equipment, drugs, supplies, and laboratory services required for comprehensive postnatal care. Additionally, efforts should be made to increase and optimize the distribution of midwives, particularly across shifts, to reduce service delivery gaps. Strengthening supportive supervision and feedback mechanisms is also critical, including routine mentorship, clinical audits, and the use of standardized guidelines to enhance adherence to recommended practices. Furthermore, health facility managers should focus on improving service organization and workflow efficiency to support continuity of care for the mother–newborn dyad. Finally, future research should explore interventions targeting health system strengthening and implementation strategies, including longitudinal and interventional studies, to better understand causal pathways and identify scalable solutions for improving postnatal care outcomes.

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