

Original Research Article

Midwives' adherence to targeted postpartum care guidelines on immediate postpartum assessment at public hospitals in Migori County, Kenya

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ABSTRACT

Background: A maternal death occurs globally every two minutes due to pregnancy or childbirth complications. Risk is highest in Sub-Saharan Africa (1:41) compared to the developed world (1:5300). The postpartum period accounts for 60% of maternal deaths, with half occurring within 24 hours after birth, mainly from postpartum hemorrhage and eclampsia. Many of these deaths are linked to suboptimal immediate postpartum assessment (IPPA). This study assessed midwives' adherence to the targeted postpartum care (TPPC) guideline on IPPA in public hospitals in Migori County, Kenya.

Methods: An analytical cross-sectional study was conducted among midwives in level 4 public hospitals in the period September 2023 to April, 2024. Sample size was calculated using Yamane's formula. Purposive sampling was used for hospital selection, and simple random sampling for participants. Participants with active practicing license and at least three months of experience in a maternity ward or MCH clinic were included. Those on orientation or internship, with expired licenses, or on leave were excluded. Data were collected via structured questionnaires and analyzed using SPSS version 28. Descriptive statistics included means and percentages; inferential analysis used logistic regression and Chi-square with significance at $p < 0.05$ and $p < 0.05$ respectively.

Results: Midwives' adherence to the TPPC guideline was moderate (65.48%). Age ($p = 0.014$), experience ($p = 0.040$), CPD frequency ($p = 0.018$), and awareness of the guideline ($p = 0.034$) were significantly associated with adherence.

Conclusions: Moderate adherence was observed, with CPD, age, experience, and guideline awareness influencing compliance. Full adherence is vital for improving maternal outcomes and reducing preventable deaths. Strengthening IPPA enforcement and targeted CPD on identified gaps is critical for enhanced adherence.

Keywords: Targeted postpartum care guideline, Postpartum assessment, Maternal mortality, Childbirth complications, Midwives' adherence

INTRODUCTION

Globally, a maternal death occurs every two minutes due to pregnancy or childbirth complications, with the highest risk in Sub-Saharan Africa (1:41) compared to 1:5300 in developed countries.¹ The postpartum period accounts for 60% of maternal deaths, half of which occur within the first 24 hours.² Most deaths are caused by postpartum

hemorrhage or eclampsia, with many linked to inadequate IPPA.³ IPPA is a critical component of midwifery care, involving close monitoring within the first 48 hours after birth for early detection of complications and timely intervention.^{1,4} The WHO's TPPC guideline recommends assessment of key maternal parameters such as vital signs, uterine tone, fundal height, vaginal bleeding, and urine output to ensure maternal wellbeing.¹ Timely

routine postpartum checks enable prevention, early diagnosis, and prompt management of complications, which can be life-saving.^{1,5}

Adherence to postpartum care guidelines is essential for quality assessment and a core responsibility in midwifery, with non-compliance linked to poor maternal outcomes role.⁶ However, gaps in adherence are widespread. In the UK, nearly half of postpartum women were not assessed due to limited midwife awareness of NICE guidelines.⁷ Across 33 Sub-Saharan African countries, immediate postpartum checks were inadequate.⁸ In Tanzania and Ethiopia, only 34% and 28% of women, respectively, received postpartum observation or physiological assessments.^{9,10} In Kenya, a study in Kakamega reported moderate adherence (63.7%), significantly influenced by midwives' knowledge ($p=0.018$).¹¹ Another study across three referral hospitals showed lower adherence to prevention-related protocols (0.71; 95% CI 0.69-0.73) than assessment-related protocols (0.81; 95% CI 0.79-0.83).¹² Due to limited data on adherence to the WHO TPPC guideline in Migori County, this study aimed to assess midwives' compliance and examine how sociodemographic factors and awareness levels affect adherence in public hospitals.

METHODS

This quantitative analytical cross-sectional study was conducted during the period of September 2023 to April 2024 at five level 4 public hospitals in Migori County, Kenya, targeting 64 midwives working in maternity wards and MCH/FP clinics. The sample size was determined using Yamane's formula for finite populations, based on a known number of midwives, equal selection probability, familiarity with the TPPC guideline, and a 0.05 margin of error.¹³ Hospitals were selected purposively, while midwives were randomly sampled. Participants were included if they were midwives who had an active practice license and at least three months of experience in a maternity ward or MCH clinic. Those on orientation or internship, with expired licenses, or on leave were excluded. Data were collected through structured, self-administered questionnaires distributed by trained research assistants. The tool included sections on demographic data, awareness of the WHO TPPC guideline (measured on a five-point Likert scale), and adherence to guideline components (measured on a three-point scale).¹⁴ The questionnaire covered themes such as IPPA timing, schedule, parameters, and content.¹ Reliability was tested using the split-half method, with pretesting conducted for consistency.¹⁵ Data were coded and securely stored before analysis using SPSS version 28. Descriptive statistics, including means, standard deviations, and percentages, were used to summarize midwives' characteristics and awareness levels. Inferential statistics included Chi-square tests to assess associations between awareness and adherence, and multivariate logistic regression to explore relationships between adherence and demographic

variables. Statistical significance was set at $p<0.05$ at a 95% confidence interval.

RESULTS

Socio-demographic characteristics included gender, age, cadre, experience as a midwife and CPD frequency. Majority gender was female (82.8%) and most respondents (45.31%) were aged between 31 and 40 years as shown in Figure 1.

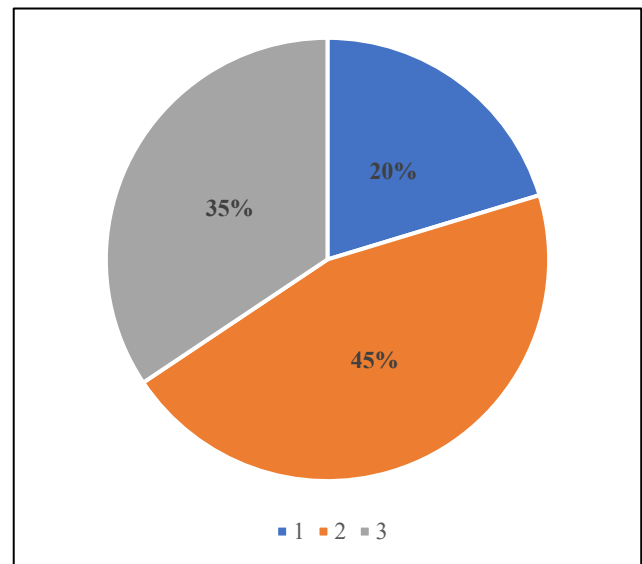


Figure 1: Distribution by age.

Category 1 are aged below 30 years; Category 2- 31-40 years; Category 3- over 40 years.

As shown in Table 1, most respondents (67.2%) were from the diploma KRCHN (midwifery) cadre, with the largest group (45.31%) having 6-10 years of experience. A majority (67.2%) had served at their current station for up to 5 years, and 71.9% were currently working in maternity wards, while only 1.56% had exclusively worked at MCH/FP clinics. Over half (56.3%) had not received CPD updates on the guideline, although 43.7% had undergone BEmONC training. Regarding hospital CPD participation, 37.5% did not engage due to lack of programs; among those with access, 32.8% participated quarterly, 15.6% monthly, and 14.1% weekly.

The study assessed midwives' awareness of the WHO TPPC guideline themes on timing, schedule and content of IPPA. Most midwives (98.4%) were aware of the guideline as the standard for IPPA, with high awareness of the rationale for vigilant assessment (92.2%), use of the mother and child booklet (89.1%), signs of uterine involution (92.2%), normal blood loss during spontaneous vaginal delivery (79.9%), and signs of eclampsia (84.4%). However, knowledge gaps were evident: only 7.8% identified major causes of maternal death, 15.5% knew the postpartum care plan, 25% were aware of the timing of the first postpartum visit and BP monitoring frequency, 39.1% recognized a normal

maternal pulse, and 31.3% identified TPPC as a maternal mortality reduction strategy. The overall average awareness across 16 variables was 59.2% (Figure 2).

On midwives' adherence levels to WHO TPPC guideline standards, results in figure 3 indicate that midwives demonstrated the highest adherence to emergency preparedness (85.9%), eclampsia prevention (84.4%), and delayed discharge after 48 hours (71.9%). Other adherence rates included documentation of assessment findings (70.3%), conducting four pre-discharge checkups (65.6%), final checks one hour before discharge (68.8%), availability of vital signs equipment (56.3%) and guideline materials (54.7%), implementation of PPH prevention measures (50.0%), and correct timing of scheduled assessments, which had the lowest adherence (46.7%). The Overall average adherence level was 65.48%.

The multivariate analysis results in Table 2 present the logistic regression findings on the association between midwives' socio-demographic factors and adherence to the TPPC guideline models. Statistically significant marginal effects (dy/dx) were observed in several areas. Gender was positively associated with the timing of assessment (0.462, model 1), while age was negatively associated with eclampsia prevention (-0.022, model 3). Experience negatively influenced the timing of

assessment (-0.344, model 1), and duration at the current hospital was negatively linked to discharge timing (-0.037, model 5). Participation in CPD was positively associated with conducting postpartum checks one hour before discharge (0.082*, model 9).

The Chi-square (χ^2) test results in Table 3 show significant associations between midwives' awareness of key IPPA parameters and adherence to TPPC guideline recommendations. For instance, familiarity with the mother and child booklet was associated with adherence to PPH prevention ($p=0.043$), while eclampsia prevention was linked to knowledge of its cardinal signs ($p=0.001$) and the timing of the first postpartum assessment ($p=0.047$). Awareness of normal maternal pulse was related to emergency preparedness ($p=0.010$), and adherence to discharge timing was associated with knowledge of IPPA reporting in MPDSR ($p=0.024$), leading causes of maternal death ($p=0.007$), and correct BP monitoring timing ($p=0.025$). Documentation of assessment findings was significantly associated with awareness of the importance of the immediate postpartum period ($p=0.016$) and monitoring for urine voiding ($p=0.003$). Additionally, recognizing postpartum period as high-risk was associated with access to WHO TPPC guideline materials ($p=0.001$). These findings led to the rejection of the null hypothesis, confirming significant associations between awareness and adherence.

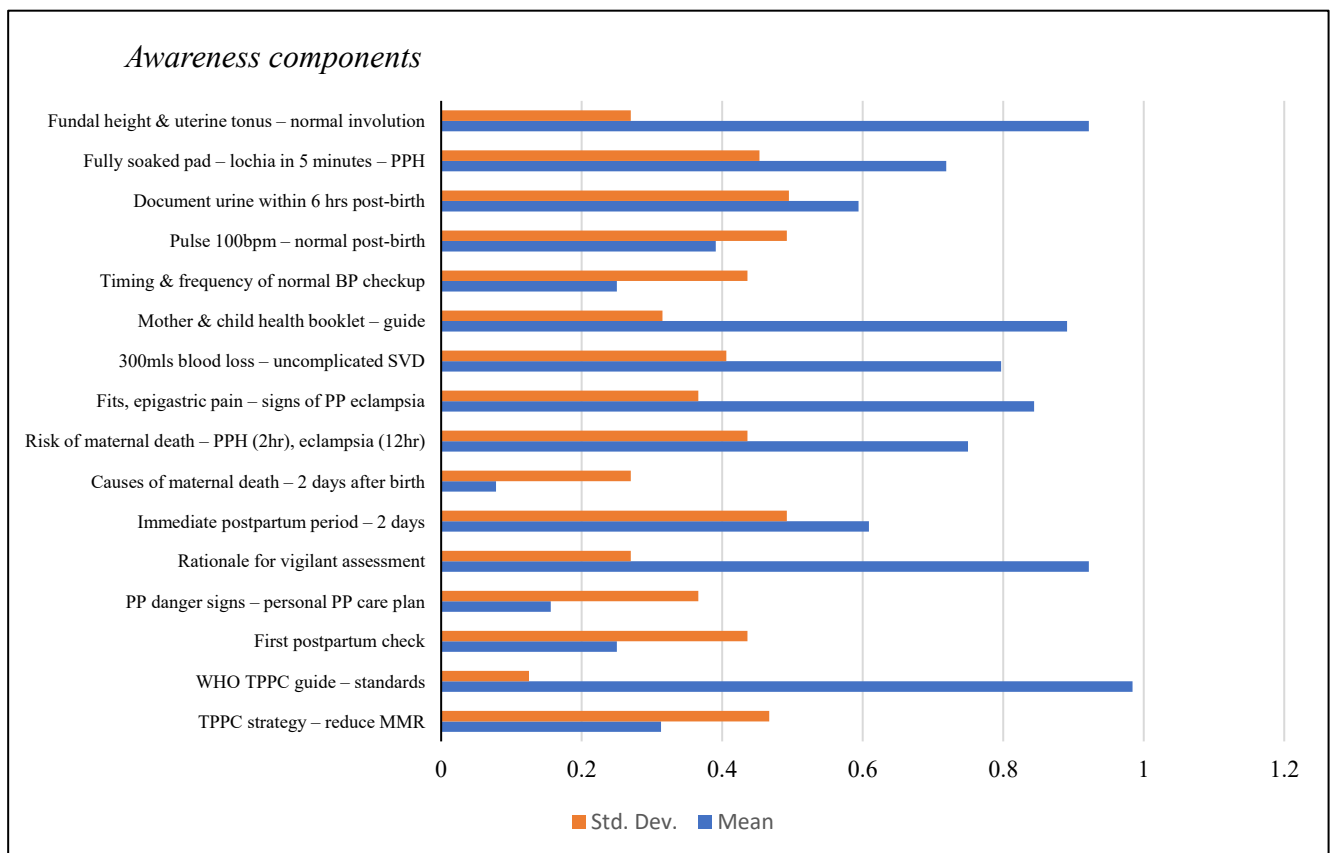


Figure 2: Level of midwives' awareness on WHO TPPC guideline for IPPA.

*Number of observations are 64; Std. Dev. is standard deviation.

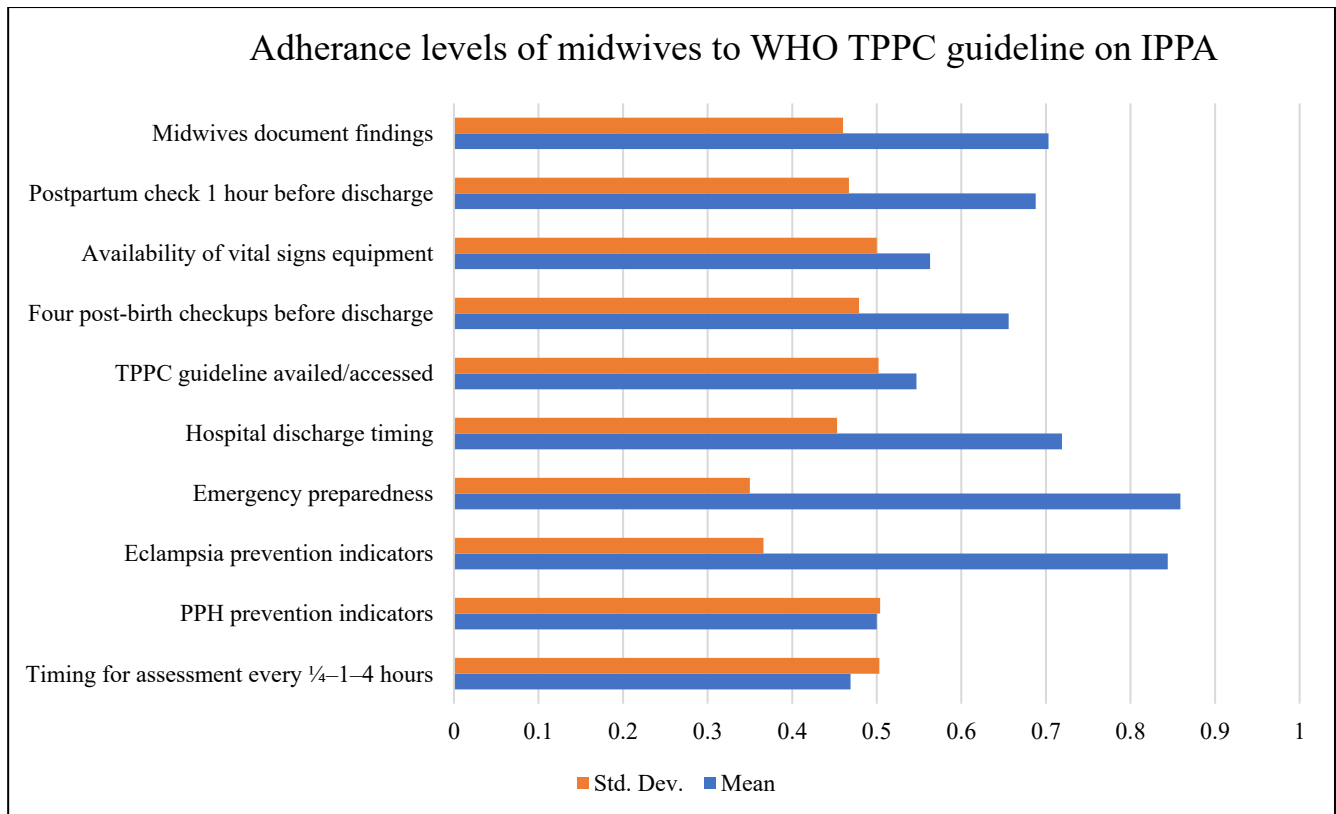


Figure 3: WHO TPPC guideline IPPA standards and adherence-respondents, (n=64).

Table 1: Participants' cadre, midwifery experience, and CPD status, (n=64).

Variables	Category	Percentages (%)
Professional midwifery cadre	KENM	4.7
	KECHN	7.8
	KRNM (Basic)	4.7
	KRN/KRM (Post-basic)	6.3
	KRCHN	65.6
	BScN	10.9
Experience (years) at current hospital	Less than 5 years	67.2
	6-10 years	18.8
	11-20 years	10.9
	Over 20 years	3.1
When last deployed to maternity	Current station	71.9
	Sometime back	26.6
	Never	1.6
Experience as a midwife	5 years or less	1.6
	6-10 years	45.3
	11-20 years	26.6
	21-30 years	21.9
	Over 30 years	4.7
Ever participated in CPD for TPPC	Yes	43.7
	No	56.3
Frequency of participation in hospital-offered CPD	Non-existent	37.5
	Quarterly	32.8
	Monthly	15.6
	Weekly	14.1

*KENM=Enrolled nurse/midwife; KECHN=Enrolled community health nurse; KRNM=Registered nurse midwife (Basic); KRN/KRM=Registered nurse/midwife (Post-basic); KRCHN=Registered community health nurse; BScN=Bachelor of science in nursing; CPD=Continuing professional development; TPPC=Targeted postpartum care guideline.

Table 2: Association between midwives' socio-demographic factors and adherence to the TPPC guideline models.

Variables	Adherence models									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Gender	0.462** (0.233)	-0.052 (0.201)	-0.016 (0.095)	0.019 (0.114)	0.249 (0.178)	0.032 (0.191)	-0.230 (0.182)	0.184 (0.197)	0.011 (0.170)	-0.050 (0.159)
Age (in years)	0.004 (0.019)	-0.020 (0.015)	-0.022** (0.010)	-0.004 (0.008)	-0.001 (0.011)	0.008 (0.015)	0.028* (0.016)	0.035* (0.018)	-0.000 (0.012)	-0.009 (0.012)
Experience	-0.344** (0.159)	0.031 (0.114)	0.105 (0.086)	-0.048 (0.062)	-0.081 (0.086)	-0.140 (0.114)	-0.231* (0.120)	0.274* (0.153)	-0.077 (0.093)	-0.042 (0.092)
Period in hospital	0.004 (0.017)	0.017 (0.015)	0.011 (0.008)	0.005 (0.009)	0.037** (0.017)	-0.003 (0.014)	-0.006 (0.014)	0.023 (0.016)	0.004 (0.013)	0.021 (0.014)
CPD	-0.033 (0.046)	-0.045 (0.049)	-0.056 (0.039)	0.014 (0.019)	-0.056 (0.039)	0.040 (0.049)	0.037 (0.041)	0.065 (0.044)	0.082* (0.044)	-0.008 (0.038)
CPD postpartum	0.030 (0.069)	0.162** (0.079)	-0.038 (0.052)	0.057* (0.030)	-0.038 (0.052)	0.034 (0.034)	-0.072 (0.064)	-0.075 (0.068)	-0.100 (0.064)	-0.148** (0.064)

N=64. Statistical analysis used: logistic regression. Confidence level of significance: $p < 0.05$ (), $p < 0.01$ (**). Values shown are conditional marginal effects (dy/dx) estimated at means. Standard errors (Std. Err) are in parentheses. Delta method applied. Key: Adherence model definitions: Model 1: Timing of postpartum (PP) check, model 2: Postpartum hemorrhage (PPH) prevention, model 3: Postpartum eclampsia prevention, model 4: Emergency preparedness, model 5: Hospital discharge timing, model 6: Aailed/accessed TPPC guideline, model 7: Four PP checks before discharge, model 8: Vital signs and equipment, model 9: Discharge assessment 1 hour before release and model 10: Midwives documentation.

Table 3: Midwives' awareness and association with adherence to the guideline-(χ^2) test.

IPPA indicator	Model definitions									
	1	2	3	4	5	6	7	8	9	10
A. Within 2 days	0.439 (0.511)	1.164 (0.281)	0.009 (0.926)	0.397 (0.528)	0.141 (0.708)	10.347 (0.001)**	1.456 (0.228)	1.496 (0.221)	2.560 (0.110)	5.750 (0.016) *
B. 1st assesses	0.753 (0.386)	0.333 (0.564)	3.951 (0.047)*	0.388 (0.533)	0.103 (0.748)	3.552 (0.059) *	0.831 (0.362)	0.339 (0.561)	0.388 (0.533)	1.223 (0.269)
C. PP care plan	0.225 (.635)	0.474 (.491)	1.858 (0.173)	1.939 (0.164)	0.021 (0.886)	0.105 (0.746)	3.122 (0.077)	3.319 (0.069)	0.009 (0.926)	0.533 (0.465)
D. Assess	1.573 (0.210)	0.217 (.641)	2.444 (0.118)	0.888 (0.346)	2.726 (0.099)	0.062 (0.804)	2.841 (0.092)	0.031 (0.860)	2.465 (0.116)	2.290 (0.130)
E. MPDSR	0.433 (0.511)	1.641 (.200)	0.596 (0.440)	1.197 (0.274)	5.115 (0.024)*	2.934 (0.087) *	0.739 (0.390)	0.301 (0.583)	0.011 (0.917)	0.636 (0.425)
F. Causes MD	0.103 (0.748)	1.953 (0.162)	1.004 (0.316)	0.888 (0.346)	7.220 (0.007)**	0.472 (0.492)	0.076 (0.783)	0.031 (0.860)	0.320 (0.572)	2.388 (0.122)
G. Eclampsia	0.225 (0.635)	0.474 (0.491)	10.623 (0.001)**	0.346 (0.557)	2.806 (0.094)	1.121 (0.290)	3.122 (0.077)	0.188 (0.664)	0.009 (0.926)	0.001 (0.981)
H. Blood loss ≥ 300 mL	0.003 (0.095)	2.413 (0.120)	0.007 (0.979)	0.023 (0.878)	1.310 (0.252)	0.479 (0.489)	0.121 (0.728)	1.117 (0.291)	1.687 (0.194)	0.001 (0.924)
I. Health booklet	3.352 (0.067)	4.010 (0.043)*	0.999 (0.317)	0.000 (0.989)	3.274 (0.070)	0.019 (0.890)	0.117 (0.732)	0.573 (0.449)	0.026 (0.871)	0.653 (0.419)
J. Blood pressure check	2.092 (0.148)	1.333 (0.248)	1.422 (0.233)	0.388 (0.533)	5.050 (0.025)*	0.526 (0.469)	2.309 (0.129)	3.048 (0.081)	0.000 (1.000)	1.223 (0.269)
K. Pulse rate	0.433 (0.511)	3.216 (0.073)	1.809 (0.179)	6.713 (0.010)**	0.000 (0.986)	1.891 (0.169)	0.048 (0.827)	1.001 (0.317)	0.011 (0.917)	2.090 (0.148)
L. Urine void	0.009 (0.924)	1.036 (0.309)	0.555 (0.456)	0.231 (0.631)	0.552 (0.457)	1.287 (0.257)	0.001 (0.973)	0.498 (0.481)	2.492 (0.114)	8.656 (0.003) **
M. Soaked pads	0.098 (0.754)	0.309 (0.578)	1.926 (0.165)	1.380 (0.240)	0.336 (0.562)	1.450 (0.228)	0.483 (0.487)	1.104 (0.293)	0.680 (0.410)	2.613 (0.106)
N. PP fundal height	0.375 (0.540)	1.953 (0.162)	1.004 (0.316)	3.019 (0.082)*	0.177 (0.674)	0.472 (0.492)	0.500 (0.481)	2.896 (0.089)	0.320 (0.572)	0.244 (0.621)

*Pearson chi-square test (χ^2); CI:95%; level of significance 5% and 1%; $p < 0.05$ and .01. Key: Model definitions as in Table 2 key. Model 1, model 2, model 3, model 4, model 5, model 6, model 7, model 8, model 9, model 10. Immediate postpartum assessment (IPPA) indicators. A-Immediate postpartum period, B-First assessment, C-Care plan, D-Vigilant assess, E-MPDSR, F-Maternal death causes, G-Fits and epigastric pain-eclampsia, H-Blood loss of 300mls at birth-PPH, I-Mother and child health booklet-reference, J-Blood pressure check-timing, K-Normal pulse-beats per minute immediately after birth, L-Urine void monitoring, M-Pad soaked in 5 minutes-PPH, N-Normal fundal height-postpartum.

DISCUSSION

This study found a moderate adherence level (65.48%) to the TPPC guideline for IPPA among midwives, aligning with findings from other Sub-Saharan African countries such as Uganda (24%), Ethiopia (42.4%) and Malawi (30.4%).¹⁶⁻¹⁸ In contrast, developed countries like Canada (100%), Australia (80%), and Jordan (94%) reported higher adherence, likely due to stronger healthcare systems and better infrastructure.¹⁹⁻²¹ Interestingly, some high-income regions like the Netherlands (46%) and California, USA (62%) also showed lower adherence, highlighting a global gap in postpartum care prioritization.^{22,23} Midwives' awareness of the guideline was moderate (59.2%), with significant associations found between awareness of key parameters and adherence, as also reflected in Ghana (28.1%) and other African contexts, where poor knowledge hindered early detection of birth complications.²⁴

Furthermore, awareness and training were strong predictors of adherence, with 58.8% of midwives who had BEmONC training significantly more likely to adhere ($p=0.034$) a trend consistent with studies from sub-Saharan Africa and Thailand emphasizing the role of CPD and guideline familiarity in improving compliance.^{25,26} Gender and age also played roles: female midwives were 46.2% more likely to adhere to assessment timings, consistent with U.S. trends, while the 31-40 age group showed higher adherence, matching Kenya's median age of 37.0.^{27,28} However, younger midwives may need support due to limited experience, despite their adaptability.²⁹ Experience varied in impact, midwives with ≤ 5 years' experience showed better adherence in this study and in Ethiopia, while in the Netherlands, more experienced midwives were less guideline-compliant, relying more on intuition.^{30,31} Overall, socio-demographic factors, CPD participation, and guideline awareness were significantly associated with adherence to TPPC standards.

Limitations

This study's generalizability and reliability were limited by its focus on public hospitals, excluding private, faith-based, and primary healthcare facilities. Additionally, passive participants and busy wards with high workload paused a challenge and patience was deployed to collect the data. The cross-sectional design, which captured data at a single time point, also limited the ability to assess changes over time. A longitudinal study across counties and different levels of the health system tiers could address these gaps.

CONCLUSION

In conclusion, midwives in Migori County showed moderate adherence to the TPPC guideline on IPPA, influenced by age, experience, CPD participation, and awareness on the guideline. Strengthening CPD and

guideline dissemination is key to improving adherence and maternal outcomes.

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