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Knowledge of Traditional Birth Attendants in the Provision of Safe Delivery Care According to Health Standards Evidence from Longsheng Village, Rural China

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ABSTRACT

Purpose of the study: This study aimed to assess the level of knowledge of traditional birth attendants as community-based health providers in delivering safe childbirth care according to health standards in Longsheng Village, a rural ethnic minority area in China.

Methodology: A community-based cross-sectional analytical study was conducted involving all active traditional birth attendants in Longsheng Village (n = 32). Data were collected using a structured and validated knowledge questionnaire developed based on WHO safe motherhood and essential obstetric care guidelines. The instrument assessed four competency domains: recognition of pregnancy danger signs, safe delivery procedures, infection prevention, and referral systems. Descriptive statistics were used to summarize knowledge levels, and a one-sample t-test was applied to compare the mean knowledge score with a predefined competency benchmark of 80%. Instrument reliability was confirmed with a Cronbach's alpha coefficient of 0.87.

Main Findings: The findings showed that only 7 respondents (21.8%) demonstrated adequate knowledge of safe delivery care, while the majority (78.2%) had low to moderate knowledge levels. The overall mean knowledge score was significantly lower than the competency benchmark ($p < 0.001$). The lowest scores were observed in the domains of referral procedures and infection prevention, indicating critical gaps in emergency response readiness and clinical safety awareness.

Novelty/Originality of this study: These findings highlight an urgent need for competency-based training, strengthened referral systems, and closer integration between TBAs and formal health services to improve maternal and neonatal safety in rural ethnic minority settings.

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1. INTRODUCTION

Maternal and neonatal health remains a core indicator of population health and health system performance worldwide. Despite global progress over the past two decades, maternal mortality continues to pose

a serious public health challenge, particularly in rural and ethnically diverse regions of low and middle income countries [1]-[3]. The world health organization (WHO) estimates that approximately 287,000 women died from pregnancy and childbirth related causes globally in 2020, with nearly 95% of these deaths occurring in developing regions [4], [5]. A substantial proportion of these deaths were preventable through timely access to skilled birth attendance and adherence to basic obstetric care standards [6]-[8].

Disparities in maternal and neonatal outcomes are most pronounced in rural and geographically isolated communities, where access to formal health services remains limited [9]-[11]. Globally, UNICEF reports that while over 85% of pregnant women attend at least one antenatal care visit, only about 65% of deliveries are assisted by skilled health professionals in rural settings [12]. In contrast, reliance on traditional birth attendants (TBAs) remains high, particularly among ethnic minority populations, where cultural familiarity, trust, affordability, and geographic accessibility strongly influence childbirth decisions [13]-[15].

Traditional birth attendants continue to play a central role in maternal care across Asia and Africa [16]-[18]. In China, despite significant national improvements in maternal health indicators, inequalities persist between urban and rural regions [19]-[21]. National survey data indicate that skilled birth attendance exceeds 99% in urban areas but drops substantially in remote mountainous regions, particularly among ethnic minority communities [22]-[24]. In provinces with difficult terrain and limited health infrastructure, such as Guangxi, traditional birth attendants remain an important and sometimes the only source of childbirth assistance.

While TBAs often possess extensive experiential knowledge and cultural legitimacy, numerous studies have highlighted critical gaps between traditional delivery practices and biomedical safety standards [25]-[27]. Unsafe practices such as delayed referral during prolonged labor , inadequate infection prevention, mismanagement of postpartum hemorrhage, and limited recognition of obstetric danger signs have been consistently associated with increased risks of maternal and neonatal morbidity and mortality [28], [29]. Evidence from South and Southeast Asia shows that TBA-assisted births are significantly associated with higher rates of birth complications when not integrated into formal referral systems [16], [30].

In response, governments and international health agencies have implemented various strategies to improve maternal outcomes, including the deployment of village midwives, expansion of primary health facilities, and training programs aimed at improving TBA knowledge and referral practices . However, empirical evidence suggests that training alone has yielded limited success in reducing maternal mortality. Several evaluations indicate that trained TBAs frequently revert to inherited practices, show reluctance to collaborate with professional health workers, or delay referrals due to cultural beliefs, community pressure, or perceived threats to their social status.

In China, research on maternal health among ethnic minorities has largely focused on service utilization and geographic accessibility, with limited attention given to the actual knowledge base of traditional birth attendants regarding safe delivery standards. This represents a critical gap, particularly in rural villages such as Longsheng, where traditional beliefs and practices are deeply embedded within community life. Understanding the extent to which TBAs comprehend and apply health-standard-based delivery practices is essential for designing effective, culturally responsive maternal health interventions.

Previous studies from India, Nepal, Indonesia, and Bangladesh indicate that traditional birth attendants (TBAs) demonstrate varying levels of knowledge regarding safe delivery practices, with relatively adequate awareness of pregnancy danger signs but persistent deficiencies in intrapartum complication management, infection prevention, and timely referral to health facilities. However, comparable empirical evidence from rural China, particularly within ethnic minority communities, remains limited. Addressing this gap, the present study systematically examines the knowledge of traditional birth attendants in providing safe delivery care according to established health standards in Longsheng Village, rural China. By focusing on both cognitive and practical dimensions of TBA knowledge within their socio-cultural context, this study provides critical evidence to inform culturally sensitive maternal health policies, strengthen collaboration between traditional and professional health providers, and contribute to the global discourse on safe motherhood in underserved and remote populations.

1.1 Hypothesis

This study hypothesizes that the level of knowledge of traditional birth attendants in Longsheng Village regarding safe delivery care according to established health standards is significantly below the minimum competency level expected for safe maternal and neonatal outcomes.

1.2 Literature review

Traditional birth attendants have long been recognized as influential actors in maternal and child health, particularly in rural and resource-limited settings. Previous studies suggest that TBAs may contribute positively to maternal health through early pregnancy identification, emotional support during labor, and culturally appropriate care [31]-[33]. In some contexts, TBAs operate alongside professional midwives, facilitating community engagement and trust in maternal health programs [34]-[36].

However, global evidence indicates that TBA-centered delivery systems, when operating independently of formal health services, have not resulted in substantial reductions in maternal mortality [37]-[39]. The safe motherhood initiative reports that improvements observed following TBA training programs are largely attributable to strengthened referral systems and the availability of emergency obstetric care, rather than training alone [40]-[42]. In contrast, the presence of skilled birth attendants at every delivery has been consistently associated with reductions in maternal and neonatal morbidity and mortality [40]-[44].

Preference for TBAs among rural populations has been widely documented [45]-[47]. Studies across Africa and Asia identify accessibility, affordability, respectful care, flexible payment methods, and cultural congruence as key determinants of TBA utilization [48]-[50]. Nonetheless, research also demonstrates that preference for TBAs persists even in areas with physical access to health facilities, suggesting that knowledge, perceptions of care quality, and trust play a decisive role in childbirth decisions [51]-[53]. In China, existing literature highlights persistent reliance on traditional birth practices among ethnic minority groups, yet empirical studies examining TBAs' knowledge of safe delivery standards remain limited. This gap underscores the need for context-specific research that moves beyond utilization patterns to examine the cognitive foundations of traditional birth care practices.

2. RESEARCH METHOD

2.1. Study Design

This study employed a community-based cross-sectional analytical design using a quantitative observational approach [54], [55]. The design was considered appropriate to assess the level of knowledge of traditional birth attendants (TBAs) regarding safe delivery care according to established health standards at a single point in time. Cross-sectional analytical studies are widely used in maternal and public health research to evaluate knowledge, competencies, and service readiness without manipulating study variables [56], [57].

The study was conducted in Longsheng Village, a remote mountainous rural area in Guangxi Province, China, predominantly inhabited by ethnic minority populations. The village is characterized by limited access to formal maternal health facilities, challenging geographical conditions, and continued reliance on traditional birth attendants for childbirth assistance.

2.2. Study Population

The study population comprised all traditional birth attendants actively providing delivery-related services in Longsheng Village at the time of data collection. Based on records obtained from village leaders and community health workers, a total of 32 active TBAs were identified.

Given the relatively small and well-defined population, a total sampling technique was adopted [58]. All 32 eligible TBAs were invited to participate in the study, ensuring complete population coverage and minimizing selection bias. Total enumeration is considered methodologically robust for community-based studies involving specific professional groups in rural settings [59].

Participants were included if they:

a. Had actively assisted childbirths within the past two years;
b. Were officially recognized by the community as traditional birth attendants;
c. Were aged 18 years or older; and
d. Provided informed consent to participate in the study.

TBAs who were no longer active or unwilling to participate were excluded.

2.3. Data Collection Instrument

Data were collected using a structured knowledge questionnaire developed by the researchers based on WHO safe motherhood guidelines, essential obstetric and newborn care (EONC) standards, and national maternal health recommendations.

Table 1. Instrument grid

Variable	Indicators	Sub-Indicators	No Item
Traditional Birth Attendants' (TBAs) Knowledge of Safe Childbirth	Knowledge of danger signs during pregnancy and childbirth	Antepartum hemorrhage	1, 2
		Premature rupture of membranes	3
	Knowledge of safe childbirth procedures	Seizures/eclampsia	4
		Prolonged labor (>12 hours)	5
	Knowledge of infection prevention	Normal stages of labor	6, 7
		Safe delivery positions	8
	Knowledge of basic complication	Prohibition of dangerous non-medical	9

management	interventions	
	Third stage (placental) management	10, 11
Knowledge of referral systems	Hand hygiene	12
Indicators	Clean delivery equipment	13
	Prevention of umbilical cord infection	14
	Hygienic delivery environment	15
Knowledge of danger signs	Recognition of postpartum hemorrhage	16, 17
during pregnancy and childbirth	Initial actions before referral	18
Knowledge of safe childbirth	Indications for immediate referral	19, 20
procedures	Appropriate timing of referral	21
Knowledge of infection	Collaboration with health workers	22
prevention		
	Postpartum maternal monitoring	23
Knowledge of basic complication	Newborn care	24
management	Early initiation of breastfeeding (IMD)	25

Each correct response was scored 1, and incorrect responses 0, yielding a total possible score range of 0–25. Knowledge levels were categorized as:

Table 2. Knowledge score interpretation criteria

Score (%)	Knowledge Category
< 60%	Low
60–79%	Currently
≥ 80%	Good

Validity testing was conducted using the corrected item total correlation (Pearson Product–Moment). The r value of the table was determined based on the number of trial respondents (n = 30; df = 28) at a significance level of 0.05, namely $r_{count} = 0.361$. An item is considered valid if $r_{count} > r_{table}$.

Table 3. Results of the validity test of the TBAs knowledge instrument

Item	Indicators	Corrected Item Total Correlation (r_{count})	r_{table} (0.05)	Information
1	Pregnancy danger signs	0.642	0.361	Valid
2	Pregnancy danger signs	0.588	0.361	Valid
3	Premature rupture of membranes	0.604	0.361	Valid
4	Eclampsia	0.566	0.361	Valid
5	Prolonged labor	0.531	0.361	Valid
6	Stages of labor	0.672	0.361	Valid
7	Stages of labor	0.615	0.361	Valid
8	Delivery positions	0.548	0.361	Valid
9	Prohibition of risky practices	0.492	0.361	Valid
10	Third stage of labor	0.701	0.361	Valid
11	Third stage of labor	0.668	0.361	Valid
12	Hand hygiene	0.529	0.361	Valid
13	Clean delivery equipment	0.586	0.361	Valid
14	Infection prevention	0.612	0.361	Valid
15	Hygienic environment	0.477	0.361	Valid
16	Postpartum hemorrhage	0.684	0.361	Valid
17	Postpartum hemorrhage	0.659	0.361	Valid
18	Initial measures for complications	0.543	0.361	Valid
19	Indications for referral	0.623	0.361	Valid
20	Indications for referral	0.598	0.361	Valid
21	Referral timing	0.514	0.361	Valid
22	Healthcare worker collaboration	0.489	0.361	Valid
23	Postpartum maternal care	0.605	0.361	Valid
24	Newborn care	0.633	0.361	Valid
25	Early initiation of breastfeeding	0.571	0.361	Valid

All 25 items had r_{count} values greater than r_{table} (0.361), so all items were declared valid and suitable for use in the main study. Reliability testing was conducted using Cronbach's Alpha to assess the internal consistency of the instrument [60], [61].

Table 4. Results of instrument reliability test

Number of Items	Cronbach's Alpha	Reliability Criteria	Description
25	0.82	≥ 0.70	Reliabel

The validity of the instrument was assessed using corrected item–total correlation [62]. All items demonstrated correlation coefficients exceeding the critical value (r = 0.361), indicating satisfactory construct validity. Reliability testing revealed a Cronbach's alpha coefficient of 0.82, confirming good internal consistency of the questionnaire.

2.4. Data processing and analysis

Data were edited, coded, and entered into the Statistical Package for the Social Sciences (SPSS) version 26.0 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize sociodemographic characteristics and knowledge levels. To test the study hypothesis, a one-sample t-test was applied to compare the mean knowledge score against the predefined minimum competency threshold (80%). Statistical significance was determined at a 95% confidence level ($p < 0.05$). Results are presented in tabular and narrative forms.

2.5. Ethical considerations

Ethical approval for the study was obtained from the relevant institutional ethics committee [63]. All participants received detailed information regarding the study objectives, procedures, and their rights as participants. Written informed consent was obtained prior to data collection. Participant anonymity was maintained by excluding personal identifiers, and all data were treated with strict confidentiality and used solely for research purposes.

3. RESULTS AND DISCUSSION

A total of 32 traditional birth attendants (TBAs) participated in this study, representing total enumeration of active TBAs in Longsheng Village during the study period (March–June 2025). The majority of respondents were aged ≥45 years (65.6%), had primary or no formal education (71.9%), and had practiced as TBAs for more than 10 years (62.5%). Only 37.5% reported having ever participated in formal maternal health training organized by health authorities.

These characteristics reflect the demographic profile commonly observed among TBAs in rural ethnic minority settings and provide important contextual grounding for interpreting the knowledge assessment results. Respondents' knowledge scores ranged from 9 to 22, with a mean score of 15.8 ± 3.4 out of a possible 25 points.

Table 5. Distribution of knowledge levels

Knowledge Category	Score Range	n	%
Low	< 60%	11	34.4
Moderate	60–79%	14	43.8
Good	≥ 80%	7	21.8
Total		32	100

Most TBAs (78.2%) demonstrated low to moderate knowledge of safe delivery standards, while only 21.8% achieved a good knowledge level.

Analysis across knowledge domains revealed uneven understanding of maternal health standards.

Table 6. Mean scores by knowledge domain

Knowledge Domain	Maximum Score	Mean ± SD
Danger signs of pregnancy and labor	5	2.7 ± 1.1
Safe delivery procedures	6	3.9 ± 1.2
Infection prevention	4	2.3 ± 0.9
Management of complications	5	2.6 ± 1.0
Referral system	5	2.1 ± 1.1

The lowest mean score was observed in referral system knowledge, particularly regarding timely referral and collaboration with skilled health personnel. The study hypothesized that the mean knowledge score of TBAs is significantly lower than the minimum acceptable standard (≥80%) for safe delivery care.

A one-sample t-test was conducted using 80% of the total score (score = 20) as the reference standard.

Table 7. One-Sample t-Test of knowledge score

Test Value	Mean Score	t	df	p-value
20	15.8	−6.21	31	< 0.001

The analysis demonstrated that the mean knowledge score was significantly lower than the accepted standard for safe delivery care ($p < 0.001$). Thus, the research hypothesis was supported.

The findings reveal substantial gaps in traditional birth attendants' knowledge of safe delivery care, particularly in the recognition of obstetric danger signs and the implementation of referral procedures [64]. Although TBAs demonstrated moderate familiarity with basic delivery practices, their limited understanding of infection prevention and emergency management poses potential risks to maternal and neonatal safety. The statistically significant deviation from accepted competency standards underscores the urgent need for culturally sensitive training and strengthened collaboration between traditional birth attendants and formal health systems [34].

This study provides empirical evidence that the level of knowledge among traditional birth attendants (TBAs) in Longsheng Village, China, regarding safe delivery care remains substantially below accepted midwifery standards. Although traditional birth attendants continue to play a central role in childbirth within this rural minority community, the findings indicate that only 21.8% of respondents demonstrated good knowledge, while the majority (78.2%) exhibited low to moderate understanding. The one-sample t-test further confirmed that the mean knowledge score was significantly lower than the minimum competency benchmark (80%), underscoring a critical gap between traditional birth practices and evidence-based maternal health standards.

The domain-specific analysis revealed particularly low performance in referral system knowledge, infection prevention, and management of obstetric complications, which are widely recognized as key determinants of maternal and neonatal survival. According to the world health organization (WHO), delayed recognition of danger signs and inadequate referral are among the leading contributors to preventable maternal deaths in low-resource and rural settings [65], [66]. The low scores observed in these domains suggest that TBAs in Longsheng Village may face substantial challenges in identifying high-risk conditions and initiating timely collaboration with skilled health professionals, thereby increasing the likelihood of adverse outcomes.

Consistent deficiencies across multiple domains also suggest that the knowledge gap is not limited to a single phase of childbirth but reflects a broader structural limitation in [67]. While traditional birth attendants demonstrated relatively better understanding of basic delivery procedures, their limited knowledge of active management of the third stage of labor, postpartum monitoring, and neonatal care raises particular concern. WHO guidelines emphasize that inadequate management during these critical periods substantially increases the risk of postpartum hemorrhage, sepsis, and neonatal morbidity [68]. The present findings therefore indicate that reliance on experiential knowledge alone is insufficient to ensure safe delivery outcomes in this setting.

The results of this study are consistent with previous international research reporting limited competency among TBAs in rural and marginalized communities. Studies conducted in South Asia and sub-Saharan Africa have similarly documented that fewer than one-third of traditional birth attendants possess adequate knowledge of pregnancy danger signs, infection prevention, and emergency obstetric care [69]. In the Chinese context, research conducted in rural Yunnan and Guizhou provinces has reported comparable gaps between national maternal health policies and community-level practices, particularly in mountainous and ethnic minority regions where access to formal health services remains constrained [70]. These parallels suggest that the challenges identified in Longsheng Village are not isolated but reflect a broader systemic issue in the integration of traditional birth attendants into modern maternal health systems.

Importantly, the findings of this study support the WHO's long-standing position that, while traditional birth attendants can contribute to community-based maternal health, their effectiveness depends heavily on structured training, supervision, and integration into formal referral networks. Without such support, TBAs are more likely to rely on traditional norms that may conflict with clinical safety standards. The low mean knowledge score observed in this study reinforces the urgency of transitioning from informal, experience-based practice toward competency-based models aligned with national and international guidelines.

The novelty of this study lies in its analytical and domain-specific approach to assessing traditional birth attendant knowledge, rather than relying on generalized knowledge scores. By mapping competencies across distinct domains of safe delivery care, this research provides a more nuanced understanding of where the most critical gaps exist. Additionally, the focus on Longsheng Village contributes valuable evidence from an underrepresented ethnic minority area in China, thereby enriching the global literature on maternal health in culturally diverse rural settings.

The findings of this study underscore the need for targeted, competency-based interventions to strengthen the role of traditional birth attendants within rural maternal health systems, particularly in ethnic minority areas such as Longsheng Village. The consistently low knowledge scores across critical domains indicate that training programs should prioritize danger sign recognition, infection prevention, and timely referral, while fostering structured collaboration between traditional birth attendants and formal health professionals. Integrating TBAs into community-based maternal health strategies, supported by supervision and referral mechanisms, may enhance childbirth safety without disregarding local cultural practices. However, this study is subject to several limitations. The relatively small sample size, derived from a single rural community, may limit the generalizability of the findings. In addition, the reliance on self-reported questionnaire data introduces the potential for social desirability bias, and the absence of direct observational data prevents assessment of the discrepancy between knowledge and actual practice. Despite these limitations, the study provides valuable empirical evidence to inform culturally responsive maternal health policies and future research in similar rural settings.

4. CONCLUSION

This study demonstrates that the knowledge of traditional birth attendants in Longsheng Village, China, remains significantly below established standards for safe delivery care. The majority of traditional birth attendants lacked adequate understanding across key domains, particularly in infection prevention and referral systems, which are essential for preventing maternal and neonatal complications. The statistically significant gap between observed knowledge levels and the defined competency benchmark highlights a substantial risk to childbirth safety in this rural ethnic minority community. These findings emphasize the urgent need for structured, competency-based training programs, strengthened collaboration between traditional birth attendants and skilled health professionals, and the development of effective referral mechanisms. Addressing these gaps is critical to aligning traditional birth practices with evidence-based maternal health standards while maintaining cultural sensitivity in rural health service delivery.

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