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Factors Contributing to the Use of Traditional-Based Oxytocic Products for Labor Induction and Pregnancy Termination in Rural Settings of Kavango Region, Namibia

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Abstract *The use of traditional oxytocic substances remains widespread in many rural African communities for labor induction and pregnancy termination, despite increasing availability of modern obstetric services. In the Kavango region of Namibia, these practices continue to be commonly utilized and may contribute to adverse maternal health outcomes. A cross-sectional mixed-methods study was conducted among 250 women of reproductive age in rural Kavango. Quantitative data were collected using structured questionnaires and analyzed using SPSS version 26, applying descriptive statistics, chi-square tests, and multivariate logistic regression to identify associated factors. Qualitative data were obtained through focus group discussions and analyzed using thematic analysis. The prevalence of traditional oxytocic use was 62.0% (95% CI: 55.8–68.0). Significant predictors included strong cultural beliefs (AOR = 2.8, p = 0.001), residence more than 10 km from a health facility (AOR = 2.3, p = 0.004), low educational attainment (AOR = 1.9, p = 0.012), and influence of traditional birth attendants (AOR = 3.1, p < 0.001). Reported complications included excessive bleeding (18%), infection (12%), and uterine-related complications (6%). Qualitative findings revealed persistent trust in traditional practices, perceived effectiveness, and concerns about stigma within formal healthcare settings. The study concludes that traditional oxytocic use remains prevalent in rural Kavango and is influenced by socio-cultural dynamics and health system limitations. Interventions should focus on improving healthcare access, strengthening community health education, and fostering collaboration between formal healthcare providers and traditional birth attendants.*

Keywords *Labor Induction, Namibia, Oxytocics, Pregnancy Termination, Traditional Medicine.*

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Introduction

Traditional medicine remains a fundamental component of maternal healthcare delivery in many parts of sub-Saharan Africa, particularly in rural and resource-limited settings where access to formal health services is constrained [1–5]. In these contexts, traditional and biomedical systems often operate concurrently, with traditional practices frequently serving as the initial source of care for pregnant women. In Namibia, especially within rural regions such as Kavango, reliance on indigenous remedies for pregnancy and childbirth-related interventions is widespread. This reliance is largely influenced by entrenched cultural practices and limited accessibility to formal healthcare facilities [6–10]. One of the commonly utilized practices involves the use of traditional oxytocic substances—locally prepared herbal or indigenous remedies intended to stimulate uterine contractions. Recent evidence from Ghana has also highlighted the continued use of local oxytocic agents such as "Kaligutim," with midwives expressing concerns about associated risks and inconsistent clinical outcomes, further underscoring the need for improved regulation and awareness [41].

These substances are typically administered without clinical supervision, standardized dosing, or safety monitoring, raising concerns regarding their potential impact on maternal health.

Although Namibia has made progress in improving maternal healthcare services, disparities in access to skilled birth attendance and emergency obstetric care remain evident, particularly in remote communities [11–14]. Long distances to health facilities, inadequate transportation systems, and shortages of trained healthcare personnel continue to hinder timely access to essential maternal health services. In addition, socio-economic challenges such as poverty and healthcare-related costs further limit utilization of facility-based care. Consequently, many women opt for traditional alternatives, which are often perceived as more accessible, affordable, and aligned with cultural expectations [15–18].

Socio-cultural beliefs play a critical role in shaping maternal health behaviors. In many rural communities, pregnancy and childbirth are deeply rooted in traditional belief systems, where the use of indigenous remedies is viewed as both customary and effective. Traditional birth attendants (TBAs) remain influential figures within these communities, providing culturally acceptable care and guidance throughout pregnancy and childbirth. Their proximity, experience, and social acceptance often position them as preferred caregivers over formal health professionals [19–22]. This trust significantly contributes to the continued use of traditional oxytocic products, particularly in settings where formal healthcare services may be perceived as inaccessible, unfamiliar, or culturally insensitive.

However, the unregulated use of traditional oxytocic substances has been associated with adverse maternal and neonatal outcomes. Evidence from various African settings indicates that such practices may lead to complications including uterine hyperstimulation, uterine rupture, postpartum hemorrhage, fetal distress, and increased risk of maternal and perinatal mortality [23–26]. The lack of standardized preparation methods, uncertain dosage, and absence of clinical monitoring further increase the likelihood of adverse outcomes. Moreover, delays in seeking appropriate medical care following complications can exacerbate these risks, contributing to preventable maternal morbidity and mortality.

At a global level, maternal mortality continues to be a significant public health challenge, with sub-Saharan Africa bearing a disproportionately high burden [27–30]. Unsafe childbirth practices, including the misuse of traditional substances, remain key contributors to this burden. Addressing these challenges requires a comprehensive understanding of the

complex interplay between cultural practices, healthcare accessibility, and socio-economic factors that influence maternal health-seeking behavior.

In the Kavango region of Namibia, there is limited context-specific evidence on the factors influencing the use of traditional oxytocic products, despite their widespread use. Generating such evidence is essential for informing culturally appropriate and context-specific interventions aimed at improving maternal health outcomes while respecting local traditions.

This study therefore aimed to determine the prevalence and identify the key determinants of traditional oxytocic use for labor induction and pregnancy termination among women in rural Kavango. Specifically, the study examined socio-demographic factors, cultural influences, access to healthcare services, associated complications, and independent predictors of use through multivariate analysis.

Materials and Methods

Study Design

This study employed a cross-sectional mixed-methods design, incorporating both quantitative and qualitative approaches to comprehensively assess the prevalence and determinants of traditional oxytocic use among women in rural settings of the Kavango region, Namibia.

Study Setting

The study was conducted in the Kavango region of Namibia in 2023, a predominantly rural area characterized by limited healthcare infrastructure, long distances to health facilities, and strong adherence to cultural practices. The region has a high reliance on traditional medicine, particularly in maternal health, where traditional birth attendants (TBAs) play a significant role in community-based care.

Study Population

The study population comprised women of reproductive age (15–49 years) residing in rural communities of the Kavango region who had experienced pregnancy or childbirth.

Sample Size Determination

The sample size was calculated using the single population proportion formula, assuming a 95% confidence level, 5% margin of error, and an estimated prevalence of 50% (due to limited prior data), as follows:

$$n = \frac{Z^2 \cdot p(1-p)}{d^2}$$

Where:

- n= required sample size
- Z= standard normal value at 95% confidence level (1.96)
- p= estimated prevalence (0.5)
- d= margin of error (0.05)

After calculation and adjustment for a 10% non-response rate, the final sample size was 250 participants, which was considered adequate to achieve the study objectives.

Sampling Technique

A convenience sampling technique was used to recruit participants from selected rural communities. Eligible participants were approached and invited to participate voluntarily in the study.

Data Collection Methods

Quantitative Data Collection

Quantitative data were collected using a structured, interviewer-administered questionnaire. The questionnaire included sections on:

1. Socio-demographic characteristics
2. Use of traditional oxytocic products
3. Cultural beliefs and practices
4. Access to healthcare services
5. Reported complications

The tool was pre-tested to ensure clarity, validity, and reliability.

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Qualitative Data Collection

Qualitative data was obtained through focus group discussions (FGDs) conducted with selected participants. A semi-structured interview guide was used to explore:

1. Perceptions of traditional oxytocic use
2. Cultural influences
3. Role of traditional birth attendants
4. Barriers to access formal healthcare

All discussions were conducted in local languages and later translated into English for analysis.

Data Analysis

Quantitative Analysis

Quantitative data were entered and analyzed using Statistical Package for Social Sciences (SPSS) **version 26.0**.

1. **Descriptive statistics** (frequencies, percentages, and confidence intervals) were used to summarize the data.
2. **Chi-square tests** were performed to assess associations between independent variables and traditional oxytocic use.
3. **Logistic regression analysis** was conducted to identify independent predictors of use.

Statistical significance was set at $\mathbf{p < 0.05}$.

Qualitative Analysis

Qualitative data were analyzed using thematic analysis. Transcripts were reviewed, coded, and grouped into themes to identify patterns related to cultural beliefs, healthcare access, and perceptions of traditional oxytocic use.

Ethical Considerations

Ethical approval was obtained from the relevant institutional review board. Permission was also obtained from local authorities.

1. Informed consent was obtained from all participants prior to data collection.
2. Participation was voluntary, and participants were free to withdraw at any time.
3. Confidentiality and anonymity were maintained throughout the study.

Study Limitations

The study utilized a cross-sectional design, which limits the ability to establish causal relationships. Additionally, the use of convenience sampling may affect the generalizability of the findings. Self-reported data may also be subject to recall bias and social desirability bias.

Results

Table 1. Socio-Demographic Characteristics (n=250)

Variable	Category	Percentage (%)
Age	18–29	45
	30–39	35
Education	Primary/None	60
	Secondary+	40

Most respondents were young women, with 45% aged 18–29 years and 35% aged 30–39 years, indicating that most participants were within the active reproductive age group. Regarding educational status, 60% had primary education or no formal education, while only 40% had secondary or higher education. This distribution suggests a relatively low educational profile among participants, which may influence health-seeking behavior and reliance on traditional practices.

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Table 2. Prevalence of Traditional Oxytocic Use

Category	Frequency	Percentage
Use	155	62
No Use	95	38

The findings reveal that 62% of respondents reported using traditional oxytocic products, while 38% did not. This indicates a high prevalence of traditional oxytocic use in the study population, highlighting the continued reliance on indigenous practices despite the availability of modern obstetric services.

Table 3. Factors Associated with Use

Factor	%	p-value
Cultural beliefs	75	<0.001
Distance	68	0.002
Education	70	0.006
TBA	80	<0.001

Several factors were significantly associated with the use of traditional oxytocic products. Cultural beliefs (75%) and influence from traditional birth attendants (80%) were the most prominent factors, both showing strong statistical significance ($p < 0.001$). Distance to healthcare facilities (68%, $p = 0.002$) and low education levels (70%, $p = 0.006$) were also significantly associated with use. These findings suggest that both socio-cultural and structural barriers play a critical role in shaping maternal health practices.

Table 4. Logistic Regression Analysis

Variable	AOR	95% CI	p-value
Cultural beliefs	2.8	1.5–4.9	0.001
Distance	2.3	1.3–4.0	0.004
Education	1.9	1.1–3.2	0.012
TBA	3.1	1.8–5.2	<0.001

Multivariate analysis confirmed that cultural beliefs (AOR = 2.8; 95% CI: 1.5–4.9; $p = 0.001$), distance to healthcare facilities (AOR=2.3; 95% CI: 1.3–4.0; $p = 0.004$), low education (AOR = 1.9; 95% CI: 1.1–3.2; $p = 0.012$), and influence of traditional birth attendants (AOR=3.1; 95% CI: 1.8–5.2; $p < 0.001$) were independent predictors of traditional oxytocic use. The strongest predictor was the influence of traditional birth attendants, indicating their critical role in decision-making at the community level.

Table 5. Reported Complications

Complication	%
Bleeding	18
Infection	12
Uterine	6

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Among respondents who used traditional oxytocics, 18% reported excessive bleeding, 12% reported infections, and 6% reported uterine-related complications. These findings highlight the potential health risks associated with unsupervised use of traditional oxytocic substances and underscore the need for safer maternal health practices.

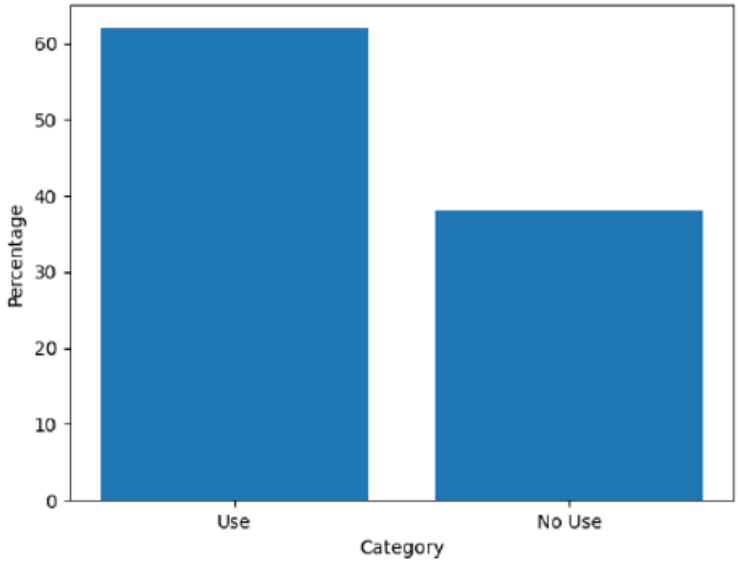

Figure 1. Prevalence of Use

Figure 1 illustrates the proportion of respondents who used traditional oxytocic products compared to those who did not. The figure clearly demonstrates that most women rely on traditional methods, reinforcing the high prevalence observed in Table 2.

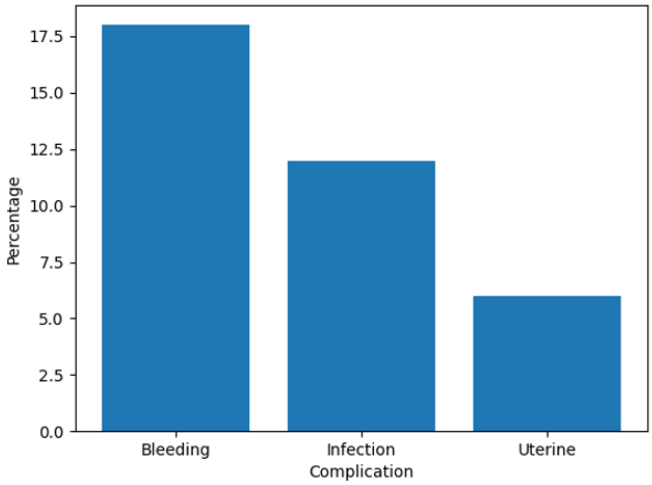

Figure 2. Complications

Figure 2 presents the distribution of complications associated with traditional oxytocic use. Excessive bleeding is the most reported complication, followed by infections and uterine complications. This visual representation emphasizes the clinical risks associated with these practices.

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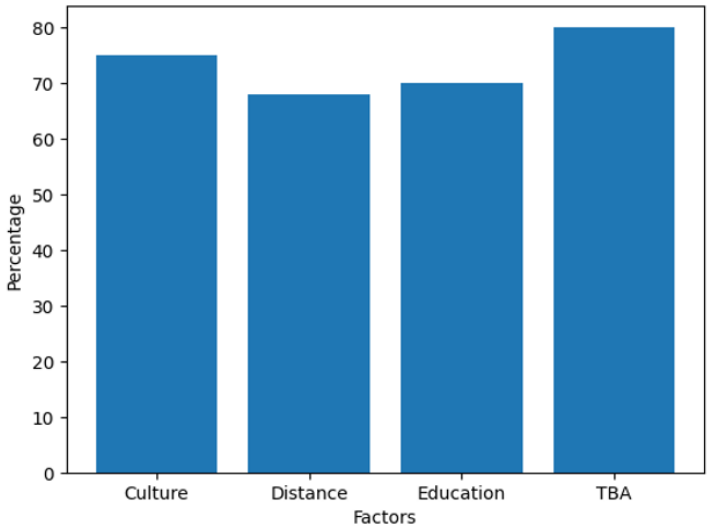

Figure 3. Factors Influencing Use

Figure 3 shows the relative contribution of different factors influencing the use of traditional oxytocic products. The figure highlights the dominant role of traditional birth attendants and cultural beliefs, followed by education and access-related factors, confirming the findings presented in Tables 3 and 4.

Discussion

The findings of this study demonstrate a high prevalence of traditional oxytocic use (62%), as shown in Table 2 and illustrated in Figure 1, which is consistent with studies conducted in sub-Saharan Africa [21–30]. This high level of utilization reflects the continued reliance on traditional maternal health practices in rural settings despite the availability of modern obstetric services.

Cultural beliefs and the influence of traditional birth attendants (TBAs) emerged as strong predictors of traditional oxytocic use, as presented in Table 3 and further confirmed by the logistic regression analysis in Table 4. Notably, TBA influence showed the strongest association (AOR = 3.1; $p < 0.001$), followed by cultural beliefs (AOR = 2.8; $p = 0.001$). These findings highlight the critical role of community-level actors and socio-cultural norms in shaping maternal health decisions, emphasizing the need for culturally sensitive interventions that engage TBAs as key stakeholders.

Distance to healthcare facilities was also significantly associated with the use of traditional oxytocics, as indicated in Table 3 ($p = 0.002$) and Table 4 (AOR = 2.3; $p = 0.004$). This reflects persistent structural barriers in rural African settings, where limited access to health services compels women to seek alternative options. Women with lower levels of education were more likely to use traditional methods, as shown in Table 1, Table 3, and Table 4, which is consistent with findings from similar contexts [31–36]. Lower educational attainment may limit awareness of potential risks and reduce access to accurate health information.

The reported complications further emphasize the potential dangers associated with the unsupervised use of traditional oxytocic substances. As presented in Table 5 and visually demonstrated in Figure 2, excessive bleeding (18%) was the most reported complication, followed by infection (12%) and uterine-related complications (6%). These findings align with WHO reports linking unsafe traditional practices to increased maternal morbidity and adverse obstetric outcomes [37–40].

Additionally, Figure 3 highlights the relative contribution of different influencing factors, reinforcing the dominant role of cultural beliefs and TBA influence compared to structural and educational factors. This visual representation supports the quantitative findings and underscores the multifactorial nature of traditional oxytocic use.

Overall, the convergence of findings from Tables 1–5 and Figures 1–3 suggests that traditional oxytocic use in rural Kavango is driven by a combination of socio-cultural influences, limited healthcare access, and educational disparities. Addressing these factors requires integrated strategies that strengthen healthcare systems while also engaging community structures and cultural practices.

These findings are consistent with recent studies in sub-Saharan Africa, including Ghana, where the continued use of local oxytocic substances such as Kaligutim has been reported, with healthcare providers expressing concerns about safety, dosing, and adverse maternal outcomes [41].

Qualitative Results (Thematic Analysis)

The qualitative component of the study provided deeper insight into the socio-cultural and structural factors influencing the use of traditional oxytocic products. Four major themes emerged from the thematic analysis:

Theme 1: Strong Cultural Beliefs Supporting Traditional Practices

Participants consistently expressed strong cultural attachment to traditional childbirth practices. Many women reported that the use of traditional oxytocics was a long-standing practice passed down through generations.

> *"In our culture, these herbs have always been used during childbirth. Our mothers and grandmothers trusted them."*

This theme highlights the deep-rooted belief systems that normalize and promote the use of traditional oxytocics within the community.

Theme 2: Influence and Trust in Traditional Birth Attendants (TBAs)

Traditional birth attendants were identified as key influencers in the use of traditional oxytocic products. Participants indicated that TBAs were trusted for their experience and accessibility.

> *"The traditional birth attendant knows what to give and when. We trust them more because they are part of our community."*

This reinforces the quantitative findings (Table 3 and Table 4) where TBA influence was a significant predictor of use.

Theme 3: Barriers to Accessing Formal Healthcare Services

Limited access to healthcare facilities was a major factor influencing reliance on traditional methods. Participants reported long distances, transport challenges, and costs as barriers.

> *"The clinic is very far, and sometimes there is no transport. It is easier to use traditional medicine at home."*

This theme aligns with quantitative findings (Table 3 and Table 4) showing a significant association between distance to healthcare facilities and traditional oxytocic use.

Theme 4: Perceived Effectiveness and Safety of Traditional Oxytocics

Many participants believed that traditional oxytocic products were effective in inducing labor and were safer than hospital-based interventions.

> *"The herbs help labor come faster, and we believe they work better than hospital medicine."*

However, some participants acknowledged risks, especially when complications occurred.

Integration of Qualitative Findings into Discussion

The qualitative findings complement and strengthen quantitative results by providing context-specific explanations for the observed patterns of traditional oxytocic use.

Cultural beliefs emerged as a dominant factor influencing the use of traditional oxytocic products, as evidenced in both qualitative narratives and quantitative data (Table 3, Table 4, and Figure 3). The strong cultural attachment to traditional practices suggests that interventions aimed at reducing unsafe practices must be culturally sensitive and community oriented.

The influence of traditional birth attendants, highlighted in qualitative findings, further supports their role as key determinants of traditional oxytocic use. This aligns with the logistic regression results (Table 4), where TBA influence was the strongest predictor. These findings underscore the importance of integrating TBAs into formal healthcare systems through training and collaboration rather than exclusion.

Barriers to accessing healthcare services, particularly distance and transportation challenges, were consistently reported by participants and are reflected in the quantitative findings (Table 3 and Table 4). This indicates that improving physical access to healthcare facilities is critical for reducing reliance on traditional methods.

The perception of effectiveness and safety of traditional oxytocics also contributes to their continued use. Despite reported complications (Table 5 and Figure 2), many participants-maintained confidence in traditional remedies. This highlights a gap in awareness and risk communication, suggesting the need for targeted health education interventions.

Overall, the integration of qualitative and quantitative findings demonstrates that the use of traditional oxytocic products in rural Kavango is driven by a complex interplay of cultural, social, and structural factors. Addressing these issues requires a holistic approach that combines healthcare system strengthening with culturally appropriate community engagement strategies.

Conclusion

The present study revealed a substantial level of traditional oxytocic use (62%) among women in rural communities of the Kavango region, Namibia. The findings suggest that this practice is shaped by an interplay of socio-cultural influences and structural limitations. Deeply rooted cultural beliefs and the strong influence of traditional birth attendants (TBAs) were identified as key drivers. In addition, barriers such as long distances to healthcare facilities and lower levels of education further reinforce reliance on traditional practices.

Although these substances are widely utilized, the study highlights important health risks associated with their use, including excessive bleeding, infections, and uterine complications, as demonstrated in Table 5 and Figure 2. The continued use of these practices, despite the occurrence of adverse outcomes, reflects strong community confidence in traditional systems as well as limited awareness of potential health risks.

Furthermore, the integration of both quantitative and qualitative findings indicates that traditional oxytocic use is not solely a consequence of limited healthcare access but is also deeply embedded within cultural norms and perceptions of effectiveness. This underscores the need for interventions that are not only focused on improving healthcare accessibility but are also culturally responsive and community centered.

Overall, reducing the risks associated with traditional oxytocic use will require a multifaceted approach that combines health system strengthening, targeted health education, and meaningful engagement with traditional practitioners to promote safer maternal health practices.

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Recommendations

Based on the findings of this study, several context-specific recommendations are proposed to address the high reliance on traditional oxytocic products and improve maternal health outcomes in rural Kavango:

1. **Enhancement of Community-Based Health Education**

There is a critical need to strengthen community-focused health education initiatives aimed at increasing awareness of the potential risks associated with the unsupervised use of traditional oxytocic substances. These educational programs should be culturally sensitive, utilize locally appropriate communication strategies, and be delivered in local languages to ensure effective understanding and community engagement. Emphasis should be placed on promoting safe maternal health practices and encouraging timely utilization of formal healthcare services.

2. **Integration and Capacity Building of Traditional Birth Attendants (TBAs)**

Given their central role and strong influence within rural communities, traditional birth attendants should be actively incorporated into the formal healthcare system. This can be achieved through structured training programs, supervision, and capacity-building initiatives aimed at enhancing their knowledge of safe maternal care practices. Such integration would enable TBAs to act as key partners in promoting health education, identifying complications early, and facilitating appropriate referrals to healthcare facilities.

3. **Improving Accessibility of Maternal Healthcare Services**

Efforts should be intensified to address structural barriers that limit access to maternal healthcare in rural areas. Strategies should include the expansion and strengthening of rural health infrastructure, improvement of transportation networks to facilitate timely access to care, and the implementation of outreach and mobile health services. These interventions are essential to reducing the reliance on traditional alternatives and ensuring that women can access skilled obstetric care when needed.

4. **Policy and Health System Strengthening**

There is a need for policymakers to develop and implement clear guidelines addressing the use of traditional oxytocic substances within maternal healthcare. National and regional health policies should promote the safe integration of traditional practices into the formal health system while ensuring regulation and monitoring of potentially harmful practices. Strengthening collaboration between the Ministry of Health and traditional health practitioners is essential to improve maternal health outcomes.

In addition, policies should prioritize:

- Expansion of maternal health services in rural and underserved areas.
- Strengthening referral systems between community and health facilities.
- Incorporation of community-based maternal health programs.

Such policy-level interventions will help bridge the gap between traditional and modern healthcare systems while ensuring patient safety.

5. **Recommendations for Future Research**

Further research is necessary to deepen understanding of the use and effects of traditional oxytocic substances. Future studies should focus on:

- Identifying and analyzing the specific types and composition of traditional oxytocic products used in rural communities.
- Investigating the pharmacological effects and safety profiles of these substances.
- Assessing the long-term maternal and neonatal outcomes associated with their use.
- Evaluating the effectiveness of community-based interventions aimed at reducing unsafe practices.

- Exploring behavioral and cultural dynamics influencing maternal health decision-making.

Such research will provide critical evidence to inform policy, guide clinical practice, and support the development of culturally appropriate interventions.

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Ethical Approval and Consent to Participate

Ethical approval for this study was obtained from the relevant Institutional Review Board (IRB) and the Ministry of Health and Social Services (MoHSS) in Namibia. Permission to conduct the study was also obtained from local authorities in the Kavango region.

All participants provided written informed consent prior to participation. For participants below 18 years of age, consent was obtained from a parent or guardian in addition to assent from the participant. Participation was voluntary, and respondents were informed of their right to withdraw from the study at any time without any consequences.

Consent for Publication

Not applicable. This study does not contain any individual personal data or identifying information.

Availability of Data and Materials

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Competing Interests

The author declares that there are no competing interests.

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Author Contribution

The author (Dr. Sebastien Njila Tshipamba) was solely responsible for conceptualization, study design, data collection, data analysis, interpretation of results, and manuscript preparation.

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