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Pregnancy and Plants: Investigating Factors Affecting Herbal Medicine Utilization among Expecting Mothers in North Gonja District

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Abstract

Background: The use of herbal medicine during pregnancy, labour, and postpartum period can affect outcomes of health and care for women of reproductive age. The use of traditional herbal medicines (THM) by pregnant women has increased in most countries in Africa, including Ghana. However, there is limited information on the extent of women's use of either herbal or vitamin supplements during pregnancy, labour and the postpartum period, even though knowledge of the potential benefits or harms of many of these products is sparse, particularly concerning their use in pregnancy. Therefore, the prevalence and factors associated with the use of herbal medicine among pregnant women in the North Gonja District in the Northern Region of Ghana were studied.

Methodology: Well-structured questionnaires were administered to 400 pregnant women in the four sub-districts of the North Gonja District who were selected using two stage sampling. The data was taken electronically, using mobile phones with kobocolect toolbox. Data was analyzed using IBM SPSS statistics version 22 (SPSS). Data was extracted from the kobocollect tool box into Microsoft excel, and imported into IBM SPSS statistics for analysis. The gathered data was analyzed to determine associations among the variables.

Results: The study revealed that about 72% of pregnant women used traditional medicine during pregnancy. Pregnant women who were of higher parity (3-4) were 2.29 times more likely to use herbal medicine than those who were of lower parity (1-2), AOR = 2.29 (CI: 1.03-5.09). no intravenous $MgSO_4$ related side effects were observed. Majority of women (85.3%) needed up to two antihypertensive medications to control their blood pressure, while only 12.4% required more than two antihypertensive medications.

Compared to women who were ever referred by a medical doctor to use herbal medicine during pregnancy, those not referred were 18.0 times more likely to use herbal medicine AOR = 18.12 (CI: 8.06-40.73). Pregnant women who were employed were more 10 times more likely to use herbal medicine, compared to those not employed. Traditional medicine was generally used to treat waist pain, vaginal discharge, lower abdominal pain, hip pain, baby movement, and abnormal fetal lying position.

Keywords

Pregnancy, Plants, Factors, Herbal, Utilization

Introduction

The increasing demand for traditional medicine in the world is a result of its effectiveness over modern medicine in treatment a range of diseases [1]. However, lack of access to modern medicines and drugs to treat and manage diseases in middle and low-income countries, especially in Africa have contributed to the widespread use of traditional medicine. In a recent study in 36 low and middle-income countries by the WHO and Health Action International (HAI),

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it was reported that conventional medicine were far beyond the reach of large sections of the populations [2]. Pregnant women use herbal medicine to treat common complaints [3]. Therefore, the extensive use of traditional medicine in Africa could be attributed to its accessibility. Indeed, most medical doctors available in Africa are concentrated in urban areas and cities at the expense of rural areas [4,5]. Therefore, for millions of people in rural areas, traditional medicine remains the only option for health care. In addition, traditional medicine promotes cultural heritage [2].

It is estimated that between 70% and 80% of people in developing countries use traditional medicine as major source of health care. It is believed that poor education in Africa has led to the widely use of traditional medicine among pregnant women [1,6]. Beside low level of education, age, the stage of pregnancy, and low income levels equally influences the use to traditional medicine in Africa, in which Ghana is no exception [7]. The Northern Region of Ghana is not different from this challenge. Most importantly, the North Gonja District as part of the Northern Region which experiences the same situations of uncontrolled use of traditional medicine by pregnant women. About 70-80% of the world's rural populations rely on herbal medicine as their basic source of medical care, despite the existence of conventional medicine [8]. Also, in developing nations, the use of traditional medicine is very common and widely used. It was confirmed by the WHO report in 2006 that approximately 80% of Africans depends on traditional medicine to treat and avoid diseases [1]. In many countries today, traditional medicine is gaining major attention, with very poor understanding on their possible effects especially among pregnant women [9].

According to the WHO, Traditional Birth Attendants (TBA) assists in childbirths in several Africa countries including Ghana. Most Ghanaians rely on traditional medicine to treat most ill-health problems, this includes pregnant women [1]. The role of traditional medicine in pregnancy, childbirth, and post-partum care is very important. Also, pregnant women in Ghana often use traditional medicines in treating pregnancy related ill-health [10].

During pregnancy, labour, and postpartum period the use of traditional medicine could be very dangerous and may result in several complications. However, most of the traditional medicines used by pregnant women is not often unknown by their physicians [2]. In addition, the inappropriate use and traditional medicine could cause a drug-herb reaction [11,12]. In most severe cases, drug-herb interactions can result in serious complications such as malformation of fetus, stillbirth, premature contraction and rapture of the uterus [13].

The use of herbal medicine during pregnancy remains a common practice, influenced by a range of factors including socio-cultural, educational, and health system-related variables. Several studies have indicated that pregnant women turn to herbal remedies due to perceptions of safety, cultural beliefs, and dissatisfaction with modern healthcare services. Herbal medicines are often regarded as natural alternatives with fewer side effects compared to pharmaceutical drugs, particularly during pregnancy when concerns about fetal health are paramount [14]. This perception is supported by the long-standing tradition of herbal medicine use across various cultures, where knowledge is typically passed down through generations [15,16].

Educational level plays a critical role in the likelihood of herbal medicine use among pregnant women. Women with lower formal education are more likely to use herbal remedies due to limited knowledge of potential risks and benefits, and the tendency to rely on traditional sources of health advice [17-19]. Similarly, women from rural areas or those with limited access to modern healthcare services may view herbal medicine as a more accessible and cost-effective treatment option [20].

Cultural influences significantly impact the use of herbal medicine during pregnancy. In many settings, cultural norms emphasize natural and holistic approaches to health, with traditional medicine systems deeply rooted in community practices [21,22]. In rural Ethiopia found that the majority of pregnant women who used herbal remedies did so based on recommendations from older female family members or traditional healers [23,24].

Moreover, herbal medicine use during pregnancy is often driven by a mistrust of conventional healthcare systems. Some pregnant women report dissatisfaction with modern healthcare due to perceived inadequate attention from healthcare providers, high costs of pharmaceutical drugs, or fear of drug side effects. These factors lead women to seek out herbal alternatives that are viewed as safer or more congruent with their cultural practices [25,26].

Socio-economic status is another determinant. Pregnant women from lower-income households often turn to herbal medicine as a cost-saving alternative to conventional medical treatments. In this context, herbal remedies are seen as not only accessible but also affordable, particularly in areas where healthcare infrastructure is limited [27]. There is also growing evidence that religious and spiritual beliefs influence the use of herbal medicine during pregnancy. Women who adhere to traditional belief systems, including animism or indigenous spiritual practices, may be more likely to use herbal medicines, seeing them as aligned with their worldview and natural order [14,16]. In contrast, pregnant women who identify with formal religious practices may also resort to herbal remedies, although the influence of religious doctrines on health behaviors varies across contexts.

While herbal medicines are widely perceived as safe, there is increasing concern regarding their potential risks during pregnancy. Studies have shown that some herbal products may cause adverse pregnancy outcomes, including preterm labor and fetal growth retardation, particularly when used without proper medical supervision [28,29]. Therefore, it is important to address the knowledge gaps concerning the safety and efficacy of herbal medicine during pregnancy, particularly in regions where its use is prevalent.

Materials and Methods

Study setting

The study was conducted in the North Gonja District of Northern Ghana Daboya. The Daboya chief is the senior in the traditional home of Gonjas. Despite the prevalence of orthodox medicine, many people in the study area still use traditional medicine. Subsistence agriculture is their main occupation, and traditional ways of relationships still prevails in the study area. Thus, the communities in the study area still adhere to patriarchal life style. The North Gonja District is among the new districts created in 2012 which was previously part of the West Gonja District with Daboya as its capital.

Study design

The research design adapted was cross-sectional and used descriptive quantitative approach for the study. This is useful in gathering data for reporting the actual prevalence of traditional medicine usage by pregnant women in the North Gonja District. In all 400 despondences were sampled using cluster and simple random sampling.

Study population

The study population comprised all pregnant women aged 15-49 years. In order to be part of the study, a pregnant woman should have been in the community for at least 8 years and be pregnant at the time of this study.

The annual district health report recorded about 1900 pregnant women in 2015, which is about 14.5% of women (within the range of 15-49 years) in the district. Hence, the target population in this study was approximately 1900 pregnant women. However, it must be stated here that not all the pregnant women are registered in the stated population as some pregnant women did not attend antenatal.

The sample size was determined using the Yamane formula at a 95% confidence interval approximate for 400 pregnant women using a target population of 1900 pregnant women.

Data collection tools

Questionnaire was used to gather relevant data from 400 respondents' pregnant women, in the four sub-districts in the district**.** The questionnaire was administered in the homes of pregnant women and others in the health facility. The questionnaires were structured in English language but were administered in the local dialects (Gonja, Tampulma, Dagomba, and Mampruli,) to help respondents with no formal education to understand**.** The questions focused on general use of traditional medicine during pregnancy, reasons for traditional medicine use and non-use, conditions for traditional medicines use and the sources of these traditional medicines and the type or varieties of traditional medicine they use. It also included the side effects of traditional medicine use and their choice of treatment in health care while pregnant. The data were collected within three months from January-March 2024.

Data analysis

The data was taken electronically, using mobile phones with kobocolect tool box. Data was analyzed using IBM SPSS statistics version 22 (SPSS). Data was extracted from the kobocollect tool box into Microsoft excel, cleaned and later imported into IBM SPSS statistics for analysis. Descriptive statistical methods were used to analyze the data. A test of association was conducted using Fisher's Exact Test to determine the association between the predictors and the use of herbal medicine during pregnancy. Frequency, percentages and bar charts were used to present the data.

Results

Socio-demographic characteristics of mothers

The majority of respondents (53.2%) were between 18-30 years-old. Those aged 31-40 comprised 42.8% of the group, while a small proportion (4.0%) were between 41-50 years. Most respondents (74.5%) were married, while 25.5% were cohabiting. The dominant religion was Islam, accounting for 71.2% of respondents, followed by Christianity (20.2%) and Traditional African Religion (8.5%). A significant proportion (67.0%) had no formal education. Respondents with Senior Secondary/ Vocational education made up 16.5%, while 12.5% had primary education and only 4.0% had Junior Secondary/ Middle School education. Most respondents (79.2%) were employed, while 20.8% were unemployed. Among the employed, farming was the most common occupation, representing 46.0% of respondents. Trading was the next most common job (15.2%), followed by fishing (13.5%) and weaving (4.5%). The largest group of respondents (57.2%) earned between GH₵ 101-300 per month. 38.2% earned less than GH₵ 100, while only 4.5% earned between GH₵ 301-500 (Table 1).

Socio-demographic characteristics of respondents

Table 2 presents the socio-demographic characteristics of respondents sampled. A total of 400 respondents were interviewed and majority of them

Table 1: Socio-demographic characteristics of mothers.

Characteristic	Responses	
	Frequency (n)	Percent (%)
Age category		
18-30	213	53.2%
31-40	171	42.8%
41-50	16	4.0%
Marital status		
Cohabiting	102	25.5%
Married	298	74.5%
Religion		
Christianity	81	20.2%
Islamic	285	71.2%
Traditional	34	8.5%
Educational level		
No formal education	268	67.0%
Senior Secondary/Vocational education	66	16.5%
Junior Secondary/Middle School	16	4.0%
Primary education	50	12.5%
Employment status		
Employed	317	79.2%
Unemployed	83	20.8%
Type of work, if employed		
Unemployed	83	20.8%
Fishing	54	13.5%
Weaving	18	4.5%
Trading	61	15.2%
Farming	184	46.0%
Income Level (GH¢) (per month)		
301-500	18	4.5%
101-300	229	57.2%
Less than 100	153	38.2%
Total	400	100%

Table 2: Maternal past obstetric, medical history and utilization of health care facilities.

Characteristic	Frequency (n)	Percentage (%)
Have you ever used any herbal medicine prior to your pregnancy		
Yes	291	72.8%
No	109	27.2%
Gestation of respondent		
6-9 months	256	64.0%
3-6 months	113	28.2%
1-3 months	31	7.8%
Gestational age at first ANC visit (months)		
Third trimester	16	4.0%
Second trimester	120	30.0%
First trimester	264	66.0%
Birth parity		
First	83	20.8%
Second	98	24.5%

Third	68	17%
Fourth	84	21%
Above fourth	67	16.8%
Parity you used traditional medicine		
First	34	8.5%
Second	37	9.3%
Third	34	8.5%
Fourth	36	9%
All pregnancies	150	37.5%
How frequently do you visit the hospital for your check-up?		
Once a week	16	4.0%
Once every two weeks	52	13.0%
Once a month	332	83.0%
Type of health facility visited during last pregnancy		
Modern hospitals	364	91.0%
Birth attendants	36	9.0%
Having a valid NHIS card?		
Yes	384	96.0%
No	16	4.0%
Total	400	100%

Table 3: Reasons for using herbal medicines ((Multiple responses possible).

What are your reasons for using herbal medicines?	Frequency (n)	Percentage (%)
Effective than conventional medicine	187	46.8%
Base of the kind of sickness experienced	85	21.3%
When conventional medicines fail	138	34.5%
Because it is Safe for pregnancy	81	20.2%
It is cheaper than conventional medicine	16	4.0%
Because the health care center does not attend to my complaints	36	9%
I use it together with conventional medicines	51	12.7%
It is part of our culture to use it	68	17.0%
Because I don't want to be operated	18	4.5%
Because of the side effects of conventional medicine	19	4.8%
Total	400	100%

(53.2%) were aged between 18-30 years. The dominant religion representing 71.2% of the respondents was Islam and 74.5% were married. Most of the pregnant women that were interviewed had no formal education (67.0%). However, 16.5% of the participants were educated up to senior secondary/vocational school level. About 79.2% of the respondents were employed. Considering the income of the respondents, the majority were low-income earners as only 4.5% earned GH 300-500 and none of them earned above GH 500.

Past obstetric, medical history of mothers and utilization of health facilities

About 291 (72%) of the respondents confirmed having used traditional medicine. Most of the pregnant women interviewed were in their third trimester and only 264 (66.0%) of them-initiated ANC in the first trimester of pregnancy. The birth parity of the respondents was relatively uniform from first to forth at about 83 (20%). However, 150 people made up of (37.5%), reported to have used traditional medicine in all their pregnancies. A good proportion (96.0%) of respondents had a valid National Health Insurance ID card. Most respondents visited the hospital once per month for a check-up (Table 2, Table 3 and Table 4).

Factors associated with herbal medicine use among pregnant women

The Table 5 presents a detailed analysis of factors associated with the use of herbal medicine among mothers, based on various characteristics such as age, religion, education, employment, income, and healthcare practices. Younger mothers (18-30) were less likely to use herbal medicine (62.4%) compared to mothers aged 31-40 (83%) and 41-50 (100%). There was a statistically significant association between age

Table 4: Reasons for stopping the use of herbal medicines during your pregnancy (multiple responses possible).

Why did you stop using herbal medicines during your pregnancy?	Frequency	Percentage
It has dangerous side effects	50	12.5%
Unsafe for pregnant women	82	20.5%
Advice from Friends/family	16	4%
It is ineffectiveness	61	15.2%
Poorly processed	16	4%
It is because of the spiritual rituals associated with it	16	4%
Under what conditions would you use herbal medicine?		
Doctors' recommendation	93	23.3%
If it is recommended by a TBA	16	4.0%
If I don't have any option	34	8.5%
Total	400	100%

Table 5: Bivariate analysis of predictors of herbal medicine use.

Characteristic	N	Do you currently use herbal medicine		Test statistic
		Yes n (%)	No n (%)	
Age of mother (years)				
18-30	213	133 (62.4%)	80 (37.6%)	Fisher's Exact Test = 27.8, p < 0.001
31-40	171	142 (83.0%)	29 (17.0%)	
41-50	16	16 (100.0%)	0 (0.0%)	
Religion of mother				
Christianity	81	81 (100.0%)	0 (0.0%)	Fisher's Exact Test = 54.9, p < 0.001
Islam	285	189 (66.3%)	96 (33.7%)	
ATR	34	21 (61.8%)	13 (38.2%)	
Mothers' education				
None	268	191 (71.3%)	77 (28.7%)	Fisher's Exact Test = 51.6, p < 0.001
Low (Primary & JHS)	66	66 (100.0%)	0 (0.0%)	
High (At least SHS)	66	34 (51.5%)	32 (48.5%)	
Employment status				
Employed	317	256 (80.8%)	61 (19.2%)	$\chi^2 = 49.4$; p < 0.001
Unemployed	83	35 (42.2%)	48 (57.8%)	
Income per month				
Less than GH 100	153	121 (79.1%)	32 (20.9%)	Fisher's Exact Test = 16.1, p < 0.001
GH 101-300	229	152 (66.4%)	77 (33.6%)	
GH 301-500	18	18 (100.0%)	0 (0.0%)	
Health Sub-district				
Daboya	155	98 (63.2%)	57 (36.8%)	$\chi^2 = 19.8$; p < 0.001
Mankarigu	55	45 (81.8%)	10 (18.2%)	
Bawena	55	35 (63.6%)	20 (36.4%)	
Lingbinsi	135	113 (83.7%)	22 (16.3%)	
Health care provider during pregnancy				
Modern hospitals	364	255 (70.1%)	109 (29.9%)	Fisher's Exact Test = 14.8, p < 0.001
Birth attendants	36	36 (100.0%)	0 (0.0%)	
Medical doctor referred woman to use herbal medicine				
Yes	45	16 (35.6%)	29 (64.4%)	$\chi^2 = 35.4$; p < 0.001
No	355	275 (77.5%)	80 (22.5%)	
Had side effects with the conventional medicines prescribed by a medical doctor?				

Yes	104	104 (100.0%)	0 (0.0%)	Fisher's Exact Test = 52.6, p < 0.001
No	296	187 (63.2%)	109 (36.8%)	
Classification of parity				
1-2	181	104 (57.5%)	77 (42.5%)	χ^2 = 43.2; p < 0.001
3-4	152	136 (89.5%)	16 (10.5%)	
> 4	67	51 (76.1%)	16 (23.9%)	

Table 6: Predictors of herbal medicine use (Regression analysis).

Predictor	B	S.E.	Wald	Sig.	Exp(B)	95% C.I. for EXP(β)	
						Lower	Upper
Parity (reference: 1-2)			14.347	0.001			
Parity (3-4)	0.830	0.407	4.148	0.042	2.29	1.03	5.09
Parity (> 4)	-0.827	0.438	3.569	0.059	0.44	0.19	1.03
Employed	2.303	0.399	33.316	< 0.001	10.00	4.58	21.85
Not recommended by a doctor	2.897	0.413	49.101	< 0.001	18.12	8.06	40.73
Constant	-3.213	0.469	46.849	< 0.001	0.040		

and herbal medicine use (Fisher's Exact Test = 27.8, p < 0.001). All Christian mothers (100%) reported using herbal medicine, while the usage was lower among Islamic (66.3%) and ATR (61.8%) mothers. Religion showed a strong association with herbal medicine use (Fisher's Exact Test = 54.9, p < 0.001). Mothers with no education had a high rate of herbal medicine use (71.3%). Interestingly, mothers with low education (Primary & JHS) all reported using herbal medicine (100%), while those with higher education (SHS and above) had the lowest usage rate (51.5%). Education level significantly impacted herbal medicine use (Fisher's Exact Test = 51.6, p < 0.001). Employed mothers were significantly more likely to use herbal medicine (80.8%) compared to unemployed mothers (42.2%), with a strong statistical association (χ^2 = 49.4, p < 0.001). Mothers earning less than GH₵ 100 had high usage of herbal medicine (79.1%), while all mothers in the GH₵ 301-500 income group used herbal medicine (100%). Income level also showed a significant association with herbal medicine use (Fisher's Exact Test = 16.1, p < 0.001). The use of herbal medicine varied significantly across different health sub-districts, ranging from 63.2% in Daboya to 83.7% in Lingbinsi (χ^2 = 19.8, p < 0.001). All mothers who relied on birth attendants used herbal medicine (100%), compared to 70.1% of those who went to modern hospitals. This was a significant factor (Fisher's Exact Test = 14.8, p < 0.001).

Mothers whose doctors referred them to herbal medicine had lower usage rates (35.6%) compared to those not referred by doctors (77.5%). This difference was statistically significant (χ^2 = 35.4, p < 0.001). All mothers who experienced side effects from conventional medicine turned to herbal medicine (100%). This was significantly associated (Fisher's Exact Test = 52.6, p < 0.001). Mothers with more children (3-4) were more likely to use herbal medicine (89.5%) compared to those with 1-2 children (57.5%). This relationship was also significant (χ^2 = 43.2, p < 0.001).

Predictors of herbal medicine use

Logistic regression analysis showed that only employment status, parity, and non-referral by a medical doctor were independently associated with herbal medicine use (Table 6). Pregnant women who were of higher parity (3-4) were 2.29 times more likely to use herbal medicine than those who were of lower parity (1-2), AOR = 2.29 (CI: 1.03-5.09). Compared to women who were ever referred by a medical doctor to use herbal medicine during pregnancy, those not referred were 18.0 times more likely to use herbal medicine AOR = 18.12 (CI: 8.06-40.73). This suggests women who used herbal medicine were less likely to be influenced by medical doctors. Pregnant women who were employed were more 10 times more likely to use herbal medicine, compared to those not employed. The three variables alone accounted for 36.2% (Nagelkerke R Square = 0.362) of the variability in herbal medicine use. It is also an indication that other factors contribute to the dependent variable but were not measured in this study.

Side-effect of herbal medicine usage in pregnancy

Among respondents who had used herbal medicine, 11.8% reported that they had side effects. Of these, 76.7% vomited had, 46.7% had a headache and 76.7% also had diarrhoea after the use of herbal medicine (Table 6). The nurses and midwives from the focus group discussion revealed that the side effect of using traditional medicine were unusual contractions leading to obstructed labour, vomiting with exhaustion causing complications, stillbirths, and sometimes maternal death (Table 7).

Discussions

The findings indicate that traditional medicine use among pregnant women is prevalent, with about 72%

Table 7: Self-reported side-effect of herbal medicine usage in pregnancy.

Variable	Frequency (n = 254)	Percentage (%)
Had any side-effect of using herbal medicine		
Yes	30	11.8%
No	224	88.2%
Type of side effect		
Vomiting		
Yes	23	76.7%
No	7	23.3%
Headache		
Yes	14	46.7%
No	16	53.3%
Diarrhoea		
Yes	23	76.7%
No	7	23.3%

of respondents confirming their use of such remedies. This aligns with other studies conducted in Sub-Saharan Africa, where traditional medicine remains a common practice due to cultural beliefs, accessibility, and perceived safety, especially in rural and resource-limited settings. For instance, Ahmed, et al. [6] found that residents in North Kordofan, Sudan, frequently relied on traditional healing methods, motivated by similar reasons such as cultural alignment and trust in local remedies.

Interestingly, a significant proportion (37.5%) of the women reported using traditional medicine in all their pregnancies. This repeated use of traditional remedies is consistent with research by Peprah, et al. [15], who observed that women in rural Ghana often view herbal remedies as integral to their pregnancy care, considering them a complement or alternative to modern medical treatments. The persistence of traditional medicine use across multiple pregnancies may be tied to both generational knowledge and the accessibility of herbal remedies compared to formal healthcare systems.

Although a high percentage (66%) of respondents initiated antenatal care (ANC) in their first trimester, a considerable number continued to rely on traditional medicine, suggesting that the two forms of care, traditional and modern are often used concurrently. This dual approach reflects findings by Buor and Agyemang [10], who showed that pregnant women in the Asante Akim North District of Ghana frequently combine herbal medicine with hospital-based care, especially during later stages of pregnancy. This phenomenon might be explained by the belief that herbal remedies provide additional support for managing pregnancy-related symptoms like nausea and fatigue, as also noted in studies from Ethiopia [14].

Furthermore, the high rate of National Health Insurance Scheme (NHIS) coverage, with 96% of women possessing valid NHIS ID cards, underscores the availability of formal healthcare services. Yet, despite this access, traditional medicine use remains robust. This suggests that traditional medicine is not merely a substitute for modern care but fulfills cultural or complementary roles that modern healthcare may not address adequately. According to Makombe, et al. [16], women in Malawi similarly preferred traditional remedies alongside antenatal care due to the cultural embeddedness of such practices in managing pregnancy.

Finally, the majority of women (96%) attended monthly hospital check-ups, indicating strong engagement with the formal health system. This is crucial for ensuring maternal and fetal health during pregnancy. However, the co-existence of traditional medicine alongside frequent hospital visits could point to a perceived gap in modern healthcare services, where traditional remedies might be seen as filling roles that biomedical treatments do not-whether in terms of symptom management, psychological comfort, or fulfilling cultural practices, as highlighted by Aziato & Antwi [13].

The present study highlights several socio-demographic and healthcare-related factors that significantly influence the use of herbal medicine among pregnant women, confirming patterns observed in previous research across Sub-Saharan Africa and other regions.

Age was found to be a critical factor, with older mothers (aged 31-50) more likely to use herbal medicine compared to younger mothers. This trend mirrors findings from studies conducted in Ethiopia and Ghana, where older women are more inclined to rely on traditional medicine due to their closer ties to cultural practices and generational knowledge [7,18]. Younger mothers, who are more likely to have access to modern healthcare and education, may be less reliant on herbal remedies, as noted by Makombe, et al. [16] in their research on pregnancy and childbirth practices in Malawi.

Religious beliefs also played a significant role in determining herbal medicine use. The finding that all Christian mothers in this study used herbal medicine contrasts with the lower usage rates among Islamic and Traditional African Religion (ATR) followers. This strong association is consistent with the study by Buor and Agyemang [10], who found that religious affiliation can significantly influence health-seeking behavior. In some Christian communities, traditional practices are deeply intertwined with faith, possibly explaining the higher prevalence of herbal medicine use.

Education emerged as a significant predictor of herbal medicine use, with less educated mothers, particularly those with no formal education or only primary schooling, reporting higher usage rates. This association aligns with previous research by Laelago, et al. [9] and Kretchy, et al. [19], which found that women with higher education are more likely to rely on formal healthcare services and modern medicine, possibly due to increased awareness of the benefits of antenatal care and modern treatments. The lower usage of herbal medicine among highly educated mothers in this study reinforces the idea that education influences attitudes toward healthcare choices, potentially encouraging a shift away from traditional remedies.

Employment status and income levels were also closely associated with herbal medicine use. Employed mothers were significantly more likely to use herbal remedies compared to their unemployed counterparts, which is consistent with findings from other studies in Ethiopia and Ghana [14,15]. Despite having financial access to modern healthcare, employed women may turn to traditional remedies either as a complement to formal treatment or due to cultural preferences. Furthermore, the use of herbal medicine across different income levels, including those earning less than GH₵ 100 and those in the GH₵ 301-500 range, highlights that herbal medicine is utilized by women of varying economic backgrounds. This suggests that accessibility and cultural embeddedness, rather than affordability alone, drive the use of traditional medicine [25].

Geographical differences in herbal medicine use were evident, with usage rates varying significantly across different health sub-districts. This aligns with research by Buor and Agyemang [10], who found that traditional medicine use is often influenced by local customs and access to healthcare facilities. Women in regions with limited access to modern healthcare may be more reliant on traditional remedies, while those in more urbanized or better-served areas may have greater access to formal healthcare systems.

The role of healthcare providers was also highlighted in this study, where all mothers who relied on traditional birth attendants reported using herbal medicine. This finding is consistent with the literature, which shows that traditional birth attendants often encourage the use of herbal remedies as part of their care practices [3,29]. By contrast, mothers who attended modern hospitals were less likely to use herbal remedies, reflecting the different approaches to healthcare between traditional and biomedical providers.

Doctor recommendations significantly influenced herbal medicine use, with lower usage rates observed among mothers whose doctors referred them to herbal treatments. This suggests that formal healthcare professionals may be cautious about endorsing traditional remedies, possibly due to concerns over safety and efficacy. Previous studies, such as those by Kretchy, et al. [19] and Bekele, et al. [14], similarly found that doctor referrals can decrease reliance on traditional medicine, as medical professionals may prioritize evidence-based treatments.

A notable finding was that all mothers who experienced side effects from conventional medicine switched to herbal remedies, highlighting dissatisfaction with modern treatments as a key driver of traditional medicine use. This is consistent with findings from studies in Ethiopia and Uganda, where side effects from prescribed medicines often prompt women to seek out alternative therapies [25,26]. This shift toward herbal medicine could be driven by the perception that traditional remedies are safer and have fewer adverse effects compared to pharmaceutical drugs [9].

Lastly, parity was found to influence herbal medicine use, with mothers who had more children being more likely to use herbal remedies. This finding aligns with previous research suggesting that experienced mothers, particularly those with larger families, may rely more on traditional practices due to familiarity and positive past experiences with herbal medicine [10,15].

The logistic regression analysis revealed that employment status, parity, and non-referral by a medical doctor were independently associated with herbal medicine use among pregnant women. These findings align with or contrast previous research, shedding light on the complex socio-demographic and healthcare factors influencing the use of traditional remedies during pregnancy.

Higher parity (3-4 children) was found to be significantly associated with the use of herbal medicine, with women of higher parity being 2.29 times more likely to use herbal medicine compared to those with fewer children (1-2 children). This finding is consistent with prior studies, such as those by Buor and Agyemang [10] and Girmaw, et al. [25], which showed that women with more children are more inclined to rely on herbal remedies. The similarity in findings may be explained by the fact that multiparous women have more experience with pregnancy, often developing trust in traditional remedies that they perceive as having worked in previous pregnancies. Additionally, these women may face increased pregnancy-related discomforts as

they age, prompting them to turn to herbal solutions they believe can effectively manage these symptoms. This pattern is common in many African communities, where herbal medicine is deeply rooted in cultural and maternal care practices.

The strong association between non-referral by a medical doctor and herbal medicine use, where women not referred by doctors were 18 times more likely to use herbal remedies, aligns with previous research but also offers a nuanced perspective. Studies such as those by Ahmed, et al. [3] and El Hajj and Holst [29] similarly found that when formal healthcare providers do not recommend or actively discourage herbal medicine use, women are more likely to self-administer traditional remedies. The findings from this study are in line with this research, reflecting the limited influence of medical professionals over women's choices when cultural norms and personal experiences strongly favor traditional practices. The contrast in attitudes between healthcare providers and patients may arise from differing perceptions of herbal medicine safety and efficacy. While medical professionals may avoid recommending herbal remedies due to concerns over potential risks Kretchy, et al. [19], women from traditional communities may view these remedies as safe, natural, and trusted alternatives to pharmaceutical drugs.

The finding that employed women were 10 times more likely to use herbal medicine compared to unemployed women is also in line with previous research but introduces a noteworthy dimension. Studies by Bekele, et al. [14] and Aziato and Antwi [13] found similar patterns, where women with higher economic standing or employment still opted for herbal remedies despite their financial ability to access modern healthcare services. The similarity in findings suggests that employment status is not simply a reflection of financial access to healthcare but may indicate a combination of accessibility, convenience, and cultural preferences. Employed women, especially in rural or resource-limited settings, may face time constraints that make it difficult to visit modern healthcare facilities regularly. Instead, they may rely on traditional remedies as a more accessible or convenient option. Moreover, the persistent use of herbal remedies despite employment suggests that economic status alone does not determine health choices; rather, the deep cultural integration of traditional medicine continues to play a dominant role, even among women who can afford biomedical care [13].

However, some aspects of the findings are somewhat contrary to previous expectations, particularly regarding the influence of healthcare providers. Studies like that of Nyeko, et al. [26] emphasized the role of doctors in steering women away from traditional remedies and toward modern care, especially when there is easy access to healthcare facilities. In contrast, the current study's findings that non-referral by doctors had such a strong influence on herbal medicine use suggests that in this context, the recommendations of healthcare providers have limited impact when cultural practices are strongly entrenched. This divergence may highlight a gap in communication or trust between medical professionals and patients, where women might turn to herbal remedies if they perceive a lack of empathy or cultural understanding from healthcare providers [15].

The finding that 11.8% of respondents who used herbal medicine experienced side effects, with vomiting (76.7%), diarrhea (76.7%), and headaches (46.7%) being the most commonly reported symptoms, reflects concerns frequently raised in the literature about the safety of traditional remedies during pregnancy. Studies by Adane, et al. [18] and El Hajj and Holst [29] have highlighted similar adverse effects, including gastrointestinal issues such as vomiting and diarrhea, which may result from the use of certain herbs. These symptoms could indicate either improper dosage or the toxic properties of some herbal components, which may not have been adequately tested for safety in pregnancy.

The side effects reported in this study are consistent with findings from other regions, where the use of herbal medicine by pregnant women has been linked to negative outcomes. In Ethiopia, for instance, Girmaw, et al. [25] noted that vomiting, nausea, and diarrhea were common side effects among women using herbal remedies during pregnancy. These adverse effects can contribute to maternal exhaustion and dehydration, further complicating pregnancy, particularly when compounded by other conditions such as malnutrition or limited access to healthcare.

The focus group discussions with nurses and midwives provided additional insights, revealing more severe complications associated with traditional medicine use, such as unusual contractions leading to obstructed labor**,** vomiting-induced exhaustion, stillbirths, and, in extreme cases, maternal death. These findings align with prior studies in Sub-Saharan Africa, which have linked herbal medicine use to adverse pregnancy outcomes. For example, Nyeko, et al. [26] reported similar risks, including prolonged labor and fetal distress, as common complications when traditional remedies are used without medical supervision. These risks are often due to the lack of standardized dosing in herbal preparations, which can lead to overdosing or interactions with other medications [13].

Moreover, the complications discussed by the healthcare professionals, such as obstructed labor and stillbirths, are particularly concerning. Ahmed, et al. [3] similarly reported that in Sudan, traditional medicine use during pregnancy contributed to maternal and neonatal complications, especially when traditional

birth attendants or family members encouraged the use of unsafe remedies. In many cases, herbs used to induce labor or ease pregnancy discomforts, such as those meant to stimulate uterine contractions, may lead to abnormal labor patterns, increasing the risk of obstructed labor and, consequently, maternal and neonatal morbidity [16].

The relationship between maternal deaths and herbal medicine use, as highlighted by the nurses and midwives, underscores the potential severity of complications that can arise from unsupervised use of traditional remedies. While maternal death due to herbal medicine use is rare, studies have documented its occurrence, particularly in rural settings where access to emergency obstetric care is limited [9]. This is often exacerbated by delays in seeking medical attention when complications arise, as women may initially rely on herbal remedies instead of visiting a healthcare facility.

These findings emphasize the critical need for awareness and education regarding the potential risks of herbal medicine during pregnancy. Although herbal remedies are deeply embedded in cultural practices, their unregulated use can lead to serious health complications, as indicated by both the reported side effects and the concerns raised by healthcare professionals. Previous research, such as that by Bekele, et al. [14], has called for integrating traditional medicine education into antenatal care programs, encouraging open dialogue between healthcare providers and pregnant women about the potential dangers of herbal remedies.

Conclusion

The findings of this study showed that traditional medicine use during pregnancy is a common practice and experience among pregnant women in the North Gonja District in Ghana. About 70% of pregnant women in the study area used traditional medicine during the pregnancy. Birth parity, age of women, educational level, income level, and occupational status were the major factors affecting the use of herbal medicine in the district.

This study highlights the widespread use of traditional medicine among pregnant women, even those with access to modern healthcare, driven by cultural importance, perceived efficacy, and accessibility. The findings emphasize the complex interplay between socio-demographic factors, healthcare access, and cultural beliefs in shaping health-seeking behaviors. Employment status, parity, and non-referral by medical doctors were key factors associated with herbal medicine use, underscoring the need for culturally sensitive healthcare strategies that integrate traditional practices with modern antenatal care. Additionally, the reported side effects and complications from herbal remedies stress the importance of bridging the gap between traditional medicine and modern healthcare to ensure maternal safety while respecting cultural preferences.

Recommendations

1. The district health directorate should implement home visits to engage pregnant women in discussions about the risks of using traditional medicine without medical supervision.
2. Antenatal care providers should prioritize addressing the health concerns of pregnant women with equal seriousness and provide thorough counselling during antenatal sessions.
3. The Ghana Health Service (GHS) should actively discourage the use of traditional medicine among pregnant women influenced by family, cultural, or religious beliefs, with particular attention to older women with high birth parity.

Author Contributions

Conceptualization, development, writing, review and editing: S.A. and S.A.M.; Data collection: S.A.M.; Formal analysis: S.A. and S.A.M.; Writing original. All authors have read and agreed to the manuscript.

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Institutional Review Board Statement

This study was conducted in accordance with the Declaration of University for Development Studies Ethical review with approval UDS/RB/189/23.

Informed Consent Statement

Written informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data supporting the findings of this study are available on request from the corresponding author, S.A.M.

Conflict of Interest

The authors declared no conflicts of interest in respect to the research, authorship, and/or publication of this article.

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