**Herbal Medicine Use Among Pregnant Women in Rural Ghana: Implications for Maternal Health and Healthcare Integration.**

**Abstract**

**Background:**
Herbal medicine use in pregnancy is widespread in Ghana, though its safety remains uncertain. In Bosomtwe District, many pregnant women reportedly use herbal remedies, but data on its prevalence and influencing factors are lacking. This study assessed the extent of use and associated factors among pregnant women.

**Methods:**
A facility-based cross-sectional study involving 316 pregnant women was conducted using a simple random sampling technique across three antenatal clinics in the Bosomtwe District. Structured questionnaires were administered, and multivariate logistic regression was employed to identify factors associated with herbal medicine use, with statistical significance set at p < 0.05.

**Results:**
Herbal medicine use during pregnancy was highly prevalent (79.7%), particularly among married, self-employed women in their mid-thirties with a Junior High School education. Despite attending antenatal care and preferring facility-based delivery, many relied on self-prepared herbal remedies such as garlic, ginger, damakesse, and fenugreek. Significant predictors of use included lower education (AOR = 12.9, 95% CI: 4.5–37.2, p < 0.001), unemployment (AOR = 27.5, 95% CI: 8.9 – 84.8, p < 0.001), and marital status (AOR = 4.2,95% CI: 1.3­­–13.3, P< 0.015). The main motivations for herbal medicine use include managing pregnancy symptoms, perceived safety, drug shortages, and sociocultural beliefs.

**Conclusion:**
Herbal medicine use is highly prevalent among pregnant women in Bosomtwe District, Ghana, and is significantly influenced by education, occupation, and cultural beliefs. Despite its widespread use, many herbal remedies lack sufficient clinical evidence on their safety and efficacy during pregnancy, posing potential risks to maternal and fetal health. There is an urgent need to integrate herbal medicine counseling into antenatal care, strengthen community health education, enhance the regulation of herbal products, and conduct further research to ensure the safe use of herbal remedies during pregnancy.

**Key words**: herbal medicine, pregnancy, prevalence, antenatal care, Ghana, traditional medicine, maternal health.

**1.0 Introduction**

Herbal medicine, defined as plant-derived materials and preparations perceived to have therapeutic benefits, has long played a central role in global healthcare systems, particularly in developing countries (Maldonado Miranda, 2021; Srivastava et al., 2018). The World Health Organization (WHO, 2008) classifies herbal medicines as herbs, herbal materials, herbal preparations, and finished products that contain parts of plants or other plant materials as active ingredients. Globally, the popularity of herbal medicine has surged, driven by factors such as perceived effectiveness, safety, cultural beliefs, and affordability (John & Shantakumari, 2015; Krsnik & Erjavec, 2024). For instance, herbal medicine ranks among the most commonly used forms of complementary and alternative medicine (CAM) in the United Kingdom and other western countries, with high lifetime and recent-use prevalence rates reported among adults (Motti, 2021; Motti et al., 2023; Sharifi et al., 2024a).

Despite its widespread use, scientific evidence for the cost-effectiveness and safety of many herbal medicines remains limited, contributing to hesitance among mainstream health systems to integrate these therapies into conventional care (Salm et al., 2023; Wang et al., 2023). Worldwide, the prevalence of traditional and complementary medicine use among pregnant women is reported to range from 7% to 96%, with the highest rates often observed in developing regions (Addis et al., 2021; Sharifi et al., 2024b). In Africa, traditional medicine remains the primary or only source of care for up to 80% of the population, including during pregnancy (Josephine Ozioma & Antoinette Nwamaka Chinwe, 2019; Mudonhi & Nunu, 2022). A considerable proportion of pregnant women across the continent rely on herbal medicine for various reasons. Studies have documented that 57% of pregnant women in Zambia, 52% in Zimbabwe, 45% in the Democratic Republic of Congo, and 55% in Tanzania use traditional remedies during pregnancy, often influenced by cultural beliefs and historical practices (Adusi-Poku et al., 2016; Josephine Ozioma & Antoinette Nwamaka Chinwe, 2019; Mawoza et al., 2019a). In Ghana and other sub-Saharan African countries, the dependence on herbal medicine is especially pronounced among rural and low-income populations, where it is commonly perceived as accessible, affordable, and effective (Illamola et al., 2019; Makombe et al., 2024; Osman et al., 2025).

The use of herbal medicine during pregnancy is, however, a subject of growing concern. The safety and efficacy profiles of most herbal preparations remain inadequately studied, and some have been associated with adverse maternal and fetal outcomes, such as preterm labor, intrauterine growth restriction, and congenital anomalies (Makombe et al., 2023a; Sarecka-Hujar & Szulc-Musioł, 2022). The risk of harmful drug-herb interactions is further compounded when herbal products are used concurrently with prescribed pharmaceuticals (Borse et al., 2019; Gamil et al., 2025; Gouws & Hamman, 2020). While the reasons for herbal medicine use during pregnancy are varied—ranging from management of pregnancy-related ailments (e.g., nausea, vomiting, fatigue) to sociocultural motivations and ease of access—the potential for negative outcomes underscores the need for context-specific research (Abukari et al., 2024a; Larle et al., 2025).

A growing body of evidence suggests that herbal medicine use in pregnancy is associated with lower educational attainment, lower socioeconomic status, limited access to modern healthcare, and stronger adherence to traditional beliefs (Abhadionmhen et al., 2025). Commonly used herbal remedies among pregnant women globally include ginger (*Zingiber officinale*), garlic (*Allium sativum*), green tea (*Camellia sinensis*), peppermint (*Mentha piperita*), and fenugreek (*Trigonella foenum graecum*) (Ameade et al., 2018b; Mawoza et al., 2019b). However, the types of herbs used and their prevalence often vary significantly between and within countries, influenced by local culture, availability, and knowledge dissemination.

In Ghana, traditional medicine has long been an integral part of the healthcare system, predating the introduction of Western medicine. Commonly used medicinal herbs included Ginger and neem leaves during pregnancy, primarily to manage waist pain, nausea, malaria, and anaemia (Appiah et al., 2018).

The government has recognized its role by establishing regulatory bodies and integrating traditional medicine into the formal health sector (Ampomah et al., 2022). Despite these efforts, the unregulated use of herbal medicines—particularly among pregnant women—remains widespread. In the Bosomtwe district of the Ashanti Region, anecdotal evidence and observations at antenatal clinics suggest a high prevalence of herbal medicine use among pregnant women. However, the factors influencing this phenomenon, as well as its potential health implications, are not well understood.

Given these gaps, there is a critical need to assess the prevalence and determinants of herbal medicine use among pregnant women in the Bosomtwe district. The findings will be instrumental for policymakers, healthcare providers, and other stakeholders in designing interventions that promote safe maternal health practices and address the risks associated with unregulated herbal medicine use. Moreover, this study will contribute to the limited body of literature on the use of traditional medicine during pregnancy in Ghana, providing a foundation for future research and policy formulation.

**2.0 METHODS**

2.1 Study **setting**

This study was conducted at St. Michael’s Hospital, Kuntanase Government Hospital, and Jackie Health Center in the Bosomtwe District of the Ashanti Region, Ghana. St. Michael’s Hospital, located in Pramso, is a medium-sized facility that specializes in maternal and pediatric care, and it offers outreach and mobile clinic services. Kuntanase Government Hospital, the district’s main public hospital in Kuntanase, provides comprehensive medical services and acts as a referral center. Jackie Health Center in Jachie provide primary healthcare and serves as the first point of contact for residents. Together, these facilities offer a wide range of health services and are crucial for studying maternal health practices, including the use of herbal medicine, among pregnant women in the district.

**2.2** S**tudy Design**

A health facility-based descriptive cross-sectional study was conducted in Bosomtwe District to collect data from health facilities using purposive and simple random sampling techniques. This study employed a descriptive cross-sectional survey to describe the prevalence and factors influencing the use of herbal medicine at a specific point in time, utilizing basic statistics (Capili, 2021).

**2.3 Study Population**

The study population included all pregnant women who attended antenatal clinic services at St. Michael’s Hospital, Kuntenase Government Hospital, and Jachie Health Centre during the study period. These women represented a diverse group in terms of age, educational background, and socio-demographic characteristics, reflecting the typical clientele of the three facilities. By focusing on all pregnant women seeking antenatal care at these centres, the study aimed to obtain a comprehensive understanding of the target population’s experiences, knowledge, and practices related to maternal health within the Bosomtwe District.

* 1. **Sample and Sampling Techniques**

A total of 15,845 participants attended antenatal care at the three selected facilities: St Michael’s Hospital (8,145), Kuntanase Government Hospital (5,342), and Jackie Health Center (1,958) in 2021. Using StatCalc function in Epi info software version 7 (Uakarn et al., 2021) and the prevalence of 70% of traditional medicine use in Ghana (Asase, 2023), at a 95% confidence level and a 5% margin of error, a minimum sample size of 316 participants (St. Michael’s Hospital: 165, Kuntanase Government Hospital: 109, and Jackie Health Center: 42) was estimated to be the required sample size for the study.

**2.5 Sampling procedure**

A simple random sampling technique was used for the facilities and respondents of the study. At each ANC clinic in the three health facilities, "YES" or "NO" was written on pieces of paper, folded, placed in a bowl, and mixed. Respondents were asked to select one option without replacement, and those who chose "YES” and agreed to participate were included in the study. This was done till the predetermined sample size was obtained. Written informed consent was obtained from each participant before their enrollment in the study.

**2.6 Tool and data collection method**

The main tool used for data collection was a structured questionnaire which consisted of three sections. Section A focused on the demographic information of respondents, Section B contained questions relating to the prevalence of herbal medicine use, and Section C addressed factors associated with the use of herbal medicine. The instrument which contained closed ended items, was developed based on a review of relevant literature and previously validated questionnaires from similar studies (Buor et al., 2023), ensuring its content validity and relevance to the research objectives. Informed written consent was sought from all selected participants prior to data collection. Each participant was given a questionnaire to complete; for those unable to read or write, the questionnaire was administered through an interview in their preferred language to facilitate accurate responses. The data collected were analyzed using SPSS version 21. Descriptive statistics were used to summarize the data, and inferential statistics, particularly the chi-square test, were employed to determine associations between socio-demographic characteristics and herbal medicine use. Statistical significance was assessed at a p-value of less than 0.05. The findings were presented in the form of tables and charts. Data collection lasted from April to May 2022.

**2.4 Inclusion** **and Exclusion Criteria**

All pregnant women receiving antenatal services at the three study sites who are willing to participate in the research are included in the study. However, pregnant women attending antenatal care at these facilities who are not willing to participate, as well as those who are very weak, ill, or unable to take part in the study due to their health condition, were excluded.

**2.7 Ethical Consideration**

Ethical approval was obtained from the Local Ethics Committee of Garden City University College on 24th February 2022, and official permission was granted by the District Health Director as well as the authorities of the participating health facilities. The study’s purpose was clearly explained to all participants, who provided informed consent prior to data collection. Participants were assured of anonymity and confidentiality, and were informed that participation was voluntary, with the freedom to withdraw at any time without penalty or impact on their care.

**3.0 RESULTS**

**3.1** **Socio-demographic Characteristics of respondents**

The study involved 316 respondents, mostly women aged 34–41 years (54.1%) with an average age of 31.5 years. Over half had completed Junior High School (53.8%), while 22.5% had tertiary education. Nearly all participants were Christians (95.3%). The majority were married (68.7%), with smaller proportions being single (23.1%), cohabiting (7.6%), or divorced/separated (0.6%). Most respondents were self-employed (59.2%), followed by those who were unemployed (22.2%), traders (12.0%), or formally employed (6.6%). Most had two or three children (67.4%), while a few (2.2%) had four or more children.

Table 1: **Socio-demographic Characteristics of respondents**

| **Variable** | **Category** | **Frequency (n=316)** | **Percent (%)** |
| --- | --- | --- | --- |
| **Age group** | 18-25 | 90 | 28.5 |
|  | 26-33 | 51 | 16.1 |
|  | 34-41 | 171 | 54.1 |
|  | 42+ | 4 | 1.3 |
|  | **Mean = 31.52 ± 6.87 SD** |  |  |
| **Educational background** | Never been to school | 25 | 7.9 |
|  | Primary | 30 | 9.5 |
|  | J.H.S | 170 | 53.8 |
|  | S.H.S | 20 | 6.3 |
|  | Tertiary | 71 | 22.5 |
| **Religious background** | Christianity | 301 | 95.3 |
|  | Muslim | 14 | 4.4 |
|  | Traditionalist | 1 | 0.3 |
| **Marital status** | Co-habitation | 24 | 7.6 |
|  | Divorced/separated | 2 | 0.6 |
|  | Married | 217 | 68.7 |
|  | Single | 73 | 23.1 |
| **Occupation** | Employed | 21 | 6.6 |
|  | Self-employed | 187 | 59.2 |
|  | Trader | 38 | 12.0 |
|  | Unemployed | 70 | 22.2 |
| **Number of children** | 2–3 children | 213 | 67.4 |
|  | 4–5 or more children | 7 | 2.2 |

**3.2 Prevalence of herbal medicine use**

Table 2 below reveals that out of the 316 respondents, most of them 311 (98.4%) attend ANC when pregnant meanwhile more than half of the respondents 159 (51.1%) do not attain the required minimum of more than 4 ANC attendance. On place of previous birth, the health facility was preferred (254) 80.4 %) over home delivery (62)19.6).

**Table 2: ANC and delivery information of respondents**

|  |  |  |
| --- | --- | --- |
| **Variables** |  **Frequency** | **Percent** |
| **Ever attended ANC(n=316)** |  |  |
| NO | 5 | 1.6 |
| Yes | 311 | 98.4 |
| **Frequency of ANC attended(n=311)** |  |  |
| Less than 4 | 159 | 51.1 |
| More than 4 | 152 | 48.9 |
| **Place of previous delivery(n=316)** |  |  |
| Health facility | 254 | 80.4 |
| Home | 62 | 19.6 |

Source: Authors Field work (2022).

The table 3 below also revealed that out of the 316 respondents, 286 (90.5%) has ever heard about herbal medicines whiles 30 (9.5 %) has never heard about herbal medicines. When asked on the source of information about herbal medicines, respondents indicated Families, friends and relatives (197 (68.9%), Media (internet, television, radio, book) 32 (12.2%) and health practitioner 9 (3.1%).

**Table 3: Herbal medicine information to respondents**

|  |  |  |
| --- | --- | --- |
| Variables |  Frequency | Percent |
| **Heard about herbal medicine(N=316)** |  |  |
| No | 30 | 4.1 |
| Yes | 286 | 44.5 |
| **Source of information about herbal medicines(N=286)** |  |  |
| Families, friends and relatives | 197 | 68.9 |
| Families, friends and relatives, Health practitioner | 9 | 3.1 |
| Families, friends and relatives, Media (internet, television, radio, book) | 12 | 4.2 |
| Families, friends and relatives, Media (internet, television, radio, book), Health practitioner | 20 | 7.0 |
| Families, friends and relatives, Media (internet, television, radio, book), Health practitioner, Pregnant women who used herbal medicines | 13 | 4.5 |
| Families, friends and relatives, Media (internet, television, radio, book), Health practitioner, Pregnant women who used herbal medicines | 35 | 12.2 |

Source: Authors Field work (2022).

In table 4 belowWhen asked whether respondents have ever used herbal medicine in their previous pregnancy, 228 (79.78%) indicated yes whiles 58 (20.3%) indicated no. On the types of herbal medicine ever used, 68 respondents representing 23.8 % used garlic and ginger whiles 4 respondents (1.4%) used peppermint. On the mode of administering herbal medicines, ingestion 109 (38%) was used by most respondents whiles cooking 1(0.3%) were used by respondents.

**Table 4: Herbal medicine used by respondents**

|  |  |  |
| --- | --- | --- |
| **Variables** |  **Frequency(n=286)** | **Percent** |
| Ever used herbal medicine in your previous pregnancy |  |  |
| No | 58 | 20.3 |
| Yes | 228 | 79.7 |
| **Type of herbal medicine ever used** |  |  |
| Damakesse | 65 | 22.7 |
| Fenugreek | 11 | 3.8 |
| Fenugreek and Damakesse | 73 | 25.5 |
| Garlic | 7 | 2.4 |
| Ginger | 30 | 10.5 |
| Ginger, Garlic | 68 | 23.8 |
| Ginger, Peppermint, Damakesse | 9 | 3.1 |
| Ginger, Peppermint, Fenugreek | 7 | 2.4 |
| Ginger, Peppermint, Garlic | 12 | 4.2 |
| Peppermint | 4 | 1.4 |
| **Mode of administration of herbal medicine used** |  |  |
| Enema | 78 | 27.3 |
| Cooking | 1 | .3 |
| Ingestion | 109 | 38.1 |
|  Insertion in vagina | 51 | 17.8 |
| Smearing on the abdomen | 14 | 4.9 |
| Inhalation | 33 | 11.5 |

Source: Authors Field work (2022).

The table 5 below indicates that 257 (76.8%) believe the effectiveness of herbal medicines whiles 29 (9.1%) indicated herbal medicine is not effective. Also, 96 (30.1%) used herbal medicines during labour whiles 64(25.4%) used herbal medicines throughout pregnancy.

**Table 5: Effectiveness and reasons for herbal medicine use**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency(n=286)** | **Percent** |
| Effectiveness and safety of herbal medicine used |  |  |
| Effective/ safe | 257 | 76.8 |
| Not effective | 29 | 9.1 |
| **Duration of pregnancy when herbal medicine was used** |  |  |
| 1st trimester | 36 | 11.3 |
| 2nd trimester | 51 | 16.0 |
| 3rd trimester | 39 | 12.2 |
| During labour | 96 | 30.1 |
| Throughout pregnancy | 64 | 25.4 |
|  |  |  |

Source: Authors Field work (2022).

**3.3 Multivariate Logistic Regression Analysis of** **Socio-demographic Predictors of Herbal Medicine Use among Pregnant Women**

Women’s educational background showed a significant association with herbal medicine use during pregnancy. Specifically, those with Junior High School education were nearly 13 times more likely to use herbal medicine compared to women with tertiary education (AOR = 12.9, 95% CI: 4.5–37.2, p < 0.001). This strong association was also observed among women with primary or no formal education. Occupation was another important predictor; unemployed women had the highest odds of herbal medicine use compared to their employed counterparts (AOR = 27.5, 95% CI: 8.9–84.8, p < 0.001), while self-employed women and traders also exhibited higher odds, though not as pronounced as the unemployed. Marital status also played a role, with married and single women more likely to use herbal medicine than those in cohabiting relationships. However, age group was not found to be a significant predictor of herbal medicine use after adjusting for other socio-demographic variables.

Table 6: Predictors of Herbal Medicine Use among Pregnant Women

| **Predictor** | **Adjusted Odds Ratio (AOR)** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| **Educational background** |  |  |  |
| (ref: Tertiary) |  |  |  |
| Never been to school | 8.5 | 2.7 – 27.0 | <0.001 |
| Primary | 6.8 | 2.1 – 22.0 | <0.001 |
| J.H.S | 12.9 | 4.5 – 37.2 | <0.001 |
| S.H.S | 2.3 | 0.7 – 7.9 | 0.172 |
| **Occupation** |  |  |  |
| (ref: Employed) |  |  |  |
| Self-employed | 11.2 | 4.3 – 29.1 | <0.001 |
| Trader | 3.4 | 1.1 – 10.2 | 0.032 |
| Unemployed | 27.5 | 8.9 – 84.8 | <0.001 |
| **Marital status** |  |  |  |
| (ref: Cohabitation) |  |  |  |
| Married | 4.2 | 1.3 – 13.3 | 0.015 |
| Single | 4.1 | 1.2 – 14.0 | 0.024 |
| Divorced/separated | 0.8 | 0.1 – 8.5 | 0.851 |
| **Age group** |  |  |  |
| (ref: 18–25) |  |  |  |
| 26–33 | 1.0 | 0.5 – 2.2 | 0.947 |
| 34–41 | 0.9 | 0.4 – 1.8 | 0.682 |
| 42+ | 0.7 | 0.1 – 7.6 | 0.778 |

3.4 **Factors associated with the use of herbal medicine**

Figure 1 below indicates that 36% of the respondents used herbal medicine because of nausea and vomiting, 3.8% used because they want to avoid cataarh and constipation.

**Figure 1: Obstetric reasons pregnant women use herbal medicine**

Source: Authors Field work (2022).

As shown in the figure 2, 60.5% of pregnant women used herbal medicine because they belief herbs are safe during pregnancy, 9.4% belief the herbs are more efficacious in the categories of sociocultural reasons.

**Figure 2: Sociocultural belief that promote herbal medicine use**

Source: Authors Field work (2022).

Majority of the respondent 47.6% stated that they used herbal because there is lack of drugs in health facility and 3.8% used it because of low cost of herbal medicine in the category of health system reasons as shown in the figure 3 below.

**Figure 3: Health system factors that influence herbal medicine use**

Source: Authors Field work (2022).

The figure 4 below shows that, majority 56.3% of the respondents also used herbal medicine during pregnancy because of respiratory infection, 7.3% use it because of febrile illness in the category of concurrent illness by the respondents.

**Figure 4: Concurrent illness experienced by respondents**

Source: Authors Field work (2022).

The table 6 below present a question on the choice of herbal medicine over orthodox, 221(77.3%) answer in affirmation and 78(27.3%) said no. a follow up on why they will prefer herbal medicine 145(50.7%) said it is healthy, good and safe, 110 (38.5%) said it cures many illnesses and 10(3.5%) said It has no side effects.

**Table 7: Preference of herbal of orthodox medicine**

|  |  |  |
| --- | --- | --- |
| Variable | Frequency | Percent |
| **Choosing herbal medicine over orthodox** |  |  |
| No | 78 | 27.3 |
| Yes | 221 | 77.3 |
| **Reasons for herbal medicine preference** |  |  |
| Because herbal medicine can cure many illnesses | 110 | 38.5 |
| Because it is healthy and good, safe | 145 | 50.7 |
| Because it's acts fast and effective | 21 | 7.3 |
| Has no side effect | 10 | 3.5 |

Source: Authors Field work (2022).

In the table 8 below,Majority 293(91.8%) of the respondents said no to a question do you have health problem not related to gestation and 23 (4.4%) answered in affirmation. A follow up on if yes specify, the respondent me they mention abdominal pains 7(30.4%) and peptic ulcer 3(13.0%). See the table below for details.

**Table 8:** **Health problem not related to gestation experience by respondents**

|  |  |  |
| --- | --- | --- |
| Variable | Frequency | Percent |
| **Health problem not related to gestation** |  |  |
| No | 293 | 91.8 |
| Yes | 23 | 4.4 |
| **Health conditions experienced** |  |  |
| Abdominal pains | 7 | 30.4 |
| Eye problems | 4 | 17.4 |
| HPT | 4 | 17.4 |
| Mood disorder | 5 | 21.7 |
| Peptic ulcer | 3 | 13.0 |

Source: Authors Field work (2022).

**4.0 DISCUSSION**

This study provides valuable insight into the socio-demographic profile, prevalence, determinants, and patterns of herbal medicine use among pregnant women in the Bosomtwe District, Ghana. The typical respondent was a married, self-employed woman in her mid-thirties, with Junior High School education, Christian faith, and two to three children—highlighting a demographic at potential risk for herbal medicine use which is similar to (Makombe et al., 2023b).

The prevalence of herbal medicine use during pregnancy was very high, with nearly eight out of every ten women reporting use, consistent with findings from similar studies in Ghana, such as... Ampomah et al., (2022; Buor et al., (2023), who also reported elevated rates. Most respondents attended antenatal care (ANC), yet just under half met the recommended four or more visits (Ayele et al., 2025). The high preference for facility-based delivery reflects some success of health education, yet significant proportions continue to use traditional remedies, sometimes in parallel with orthodox care (Chali et al., 2021).

Awareness of herbal medicines was extensive, with the vast majority of women reporting knowledge, mainly acquired from family, friends, and media, similar to findings from Zaidi et al., (2022). This highlights the significant influence of social networks and informal communication on shaping health behaviors. Most users reported using herbal remedies such as garlic, ginger, damakesse, and fenugreek—primarily by ingestion or enema—with the majority perceiving them as effective and safe, and many utilizing them throughout pregnancy or specifically during labor (Laelago et al., 2016; Zaidi et al., 2022).

Multivariate logistic regression analysis revealed that women with lower educational attainment, especially those with only Junior High School education, were significantly more likely to use herbal medicines than those with tertiary education. Similarly, unemployed and self-employed women showed markedly higher odds of herbal medicine use. These findings align with previous research (Adane et al., 2020; Bekele et al., 2024; Belayneh et al., 2022). Married and single women were more likely to use herbal medicines than those cohabiting, potentially due to variations in household support, cultural influences, or health autonomy, while age was not a significant independent predictor (James et al., 2018).

Obstetric factors such as nausea and vomiting, sociocultural beliefs regarding the safety and efficacy of herbs, health system limitations (notably drug shortages), and concurrent illnesses like respiratory infections were common reasons for herbal medicine use. These findings confirm previous studies (Abukari et al., 2024b; Sumankuuro et al., 2020) showing that a complex interplay of personal, cultural, and systemic factors drives herbal medicine use in pregnancy.

The strong preference for herbal over orthodox medicine—driven by perceptions of safety, health benefits, and efficacy—suggests persistent gaps in health education and trust in conventional care. While most respondents did not report non-gestational health problems, a few mentioned abdominal pain, mood disorders, hypertension, and peptic ulcers, which could further motivate herbal use (Ameade et al., 2018a; Ampomah et al., 2024).

These findings highlight the urgent need for culturally sensitive, community-based health education programs, integration of herbal medicine counseling into ANC services, and policy interventions targeting women with lower educational attainment and those outside formal employment. Addressing health system barriers, such as medicine stockouts, will also be crucial in reducing reliance on unregulated traditional remedies during pregnancy.

**Conclusion**

In conclusion, herbal medicine use among pregnant women in Bosomtwe District in Ghana is widespread, driven by socio-demographic factors (education, occupation, marital status) and motivations like cultural beliefs, perceived safety, and health system gaps. Culturally sensitive education and stronger regulation are urgently needed, with targeted interventions to protect at-risk groups and improve maternal health outcomes.

**Recommendations**

The study recommendations include integrating herbal medicine counseling into antenatal care, enhancing community health education, strengthening the regulation and monitoring of herbal products, and encouraging further research on the safety and effectiveness of herbal medicine use during pregnancy.

 **Limitations**

This study is limited by its cross-sectional design, potential self-report bias, restricted generalizability beyond one district, and lack of data on herbal composition, dosage, and safety.

**Declaration**

Ethics approval and consent to participate

Ethical approval was obtained from the Local Ethics Committee of Garden City University College, on 24th February 2022 and official permission was granted by the District Health Director as well as the authorities of the participating health facilities. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The study’s purpose was clearly explained to all participants, who gave informed consent before data collection. Participants were assured of anonymity and confidentiality, and were informed that participation was voluntary, with the freedom to withdraw at any time without penalty or impact on their care.

**Abbreviations**

 **ANC Antenatal Care**

**CAM Complementary and Alternative Medicine**

**SPSS Statistical Package for the Social Sciences**

**WHO World Health Organization**

**J.H.S Junior High School**

 **S.H.S Senior High School**

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

REFERENCE

Abhadionmhen, A. O., Imarenezor, E. P. K., Ogodo, A. C., & Ahuchaogu, A. A. (2025). Socioeconomic and cultural factors influencing traditional medicine (TM) use in Nigeria: A systematic mixed method review. *European Journal of Integrative Medicine*, *74*, 102436. https://doi.org/10.1016/J.EUJIM.2025.102436

Abukari, S., Abdul-Manan, S., & Alice Bavoh, E. (2024a). Pregnancy and Plants: Investigating Factors Affecting Herbal Medicine Utilization among Expecting Mothers in North Gonja District. *International Journal of Women’s Health and Wellness*, *10*(1). https://doi.org/10.23937/2474-1353/1510164

Abukari, S., Abdul-Manan, S., & Alice Bavoh, E. (2024b). Pregnancy and Plants: Investigating Factors Affecting Herbal Medicine Utilization among Expecting Mothers in North Gonja District. *International Journal of Women’s Health and Wellness*, *10*(1), 164. https://doi.org/10.23937/2474-1353/1510164

Adane, F., Seyoum, G., Alamneh, Y. M., Abie, W., Desta, M., & Sisay, B. (2020). Herbal medicine use and predictors among pregnant women attending antenatal care in Ethiopia: A systematic review and meta-analysis. *BMC Pregnancy and Childbirth*, *20*(1). https://doi.org/10.1186/S12884-020-2856-8

Addis, G. T., Workneh, B. D., & Kahissay, M. H. (2021). Herbal medicines use and associated factors among pregnant women in Debre Tabor town, north West Ethiopia: a mixed method approach. *BMC Complementary Medicine and Therapies*, *21*(1). https://doi.org/10.1186/s12906-021-03439-3

Adusi-Poku, Y., Vanotoo, L., Detoh, E., Oduro, J., Nsiah, R., & Natogmah, A. (2016). Type of herbal medicines utilized by pregnant women attending ante-natal clinic in Offinso north district: Are orthodox prescribers aware? *Ghana Medical Journal*, *49*(4), 227. https://doi.org/10.4314/GMJ.V49I4.2;

Ameade, E. P. K., Ibrahim, M., Ibrahim, H. S., Habib, R. H., & Gbedema, S. Y. (2018a). Concurrent Use of Herbal and Orthodox Medicines among Residents of Tamale, Northern Ghana, Who Patronize Hospitals and Herbal Clinics. *Evidence-Based Complementary and Alternative Medicine : ECAM*, *2018*, 1289125. https://doi.org/10.1155/2018/1289125

Ameade, E. P. K., Ibrahim, M., Ibrahim, H.-S., Habib, R. H., & Gbedema, S. Y. (2018b). Concurrent Use of Herbal and Orthodox Medicines among Residents of Tamale, Northern Ghana, Who Patronize Hospitals and Herbal Clinics. *Evidence-Based Complementary and Alternative Medicine*, *2018*(1). https://doi.org/10.1155/2018/1289125;

Ampomah, I. G., Ampomah, G. A., & Emeto, T. I. (2024). Integrating modern and herbal medicines in controlling malaria: experiences of orthodox healthcare providers in Ghana. *Archives of Public Health 2024 82:1*, *82*(1), 1–15. https://doi.org/10.1186/S13690-024-01472-5

Ampomah, I. G., Malau-Aduli, B. S., Seidu, A. A., Malau-Aduli, A. E. O., & Emeto, T. I. (2022). Integrating traditional medicine into the Ghanaian health system: perceptions and experiences of traditional medicine practitioners in the Ashanti region. *International Health*, *15*(4), 414. https://doi.org/10.1093/INTHEALTH/IHAC059

Appiah, K. S., Oppong, C. P., Mardani, H. K., Omari, R. A., Kpabitey, S., Amoatey, C. A., Onwona-Agyeman, S., Oikawa, Y., Katsura, K., & Fujii, Y. (2018). Medicinal Plants Used in the Ejisu-Juaben Municipality, Southern Ghana: An Ethnobotanical Study. *Medicines*, *6*(1), 1. https://doi.org/10.3390/MEDICINES6010001

Asase, A. (2023). Ghana’s herbal medicine industry: prospects, challenges and ways forward from a developing country perspective. *Frontiers in Pharmacology*, *14*, 1267398. https://doi.org/10.3389/FPHAR.2023.1267398/BIBTEX

Ayele, B. A., Holliday, E., & Chojenta, C. (2025). Determinants of antenatal care service utilisation in sub-Saharan Africa: an analysis of demographic and health surveys data (2015–2022). *Archives of Public Health*, *83*(1), 189. https://doi.org/10.1186/S13690-025-01608-1

Bekele, G. G., Woldeyes, B. S., Taye, G. M., Kebede, E. M., & Gebremichael, D. Y. (2024). Use of herbal medicine during pregnancy and associated factors among pregnant women with access to public healthcare in west Shewa zone, Central Ethiopia: sequential mixed-method study. *BMJ Open*, *14*(2). https://doi.org/10.1136/bmjopen-2023-076303

Belayneh, Y. M., Yoseph, T., & Ahmed, S. (2022). A cross-sectional study of herbal medicine use and contributing factors among pregnant women on antenatal care follow-up at Dessie Referral Hospital, Northeast Ethiopia. *BMC Complementary Medicine and Therapies*, *22*(1), 146. https://doi.org/10.1186/S12906-022-03628-8

Borse, S. P., Singh, D. P., & Nivsarkar, M. (2019). Understanding the relevance of herb–drug interaction studies with special focus on interplays: a prerequisite for integrative medicine. *Porto Biomedical Journal*, *4*(2), e15. https://doi.org/10.1016/J.PBJ.0000000000000015

Buor, D., Agyemang, S., & Awuku, P. (2023). The Determinants of Utilisation of Herbal Medicine Among Pregnant Women in the Asante Akim North District, Ghana. *Maternal and Child Health Journal*, *27*(10), 1886–1896. https://doi.org/10.1007/S10995-023-03676-7/METRICS

Capili, B. (2021). Overview: Cross-Sectional Studies. *The American Journal of Nursing*, *121*(10), 59. https://doi.org/10.1097/01.NAJ.0000794280.73744.FE

Chali, B. U., Hasho, A., & Koricha, N. B. (2021). Preference and Practice of Traditional Medicine and Associated Factors in Jimma Town, Southwest Ethiopia. *Evidence-Based Complementary and Alternative Medicine : ECAM*, *2021*, 9962892. https://doi.org/10.1155/2021/9962892

Gamil, N. M., Elsayed, H. A., Hamed, R. M., Salah, E. T., Ahmed, A. M., Mostafa, H. A., El-Shiekh, R. A., & Abou-Hussein, D. (2025). Insights from herb interactions studies: a foundational report for integrative medicine. *Future Journal of Pharmaceutical Sciences 2025 11:1*, *11*(1), 1–27. https://doi.org/10.1186/S43094-025-00794-7

Gouws, C., & Hamman, J. H. (2020). What are the dangers of drug interactions with herbal medicines? *Expert Opinion on Drug Metabolism & Toxicology*, *16*(3), 165–167. https://doi.org/10.1080/17425255.2020.1733969

Illamola, S. M., Amaeze, O. U., Krepkova, L. V., Birnbaum, A. K., Karanam, A., Job, K. M., Bortnikova, V. V., Sherwin, C. M. T., & Enioutina, E. Y. (2019). Use of herbal medicine by pregnant women: Why physicians need to know. *Frontiers in Pharmacology*, *10*, 1483–1483. https://doi.org/10.3389/fphar.2019.01483

James, P. B., Taidy-Leigh, L., Bah, A. J., Kanu, J. S., Kangbai, J. B., & Sevalie, S. (2018). Prevalence and Correlates of Herbal Medicine Use among Women Seeking Care for Infertility in Freetown, Sierra Leone. *Evidence-Based Complementary and Alternative Medicine : ECAM*, *2018*, 9493807. https://doi.org/10.1155/2018/9493807

John, L. J., & Shantakumari, N. (2015). Herbal medicines use during pregnancy: A review from the middle east. In *Oman Medical Journal* (Vol. 30, Issue 4, pp. 229–236). Oman Medical Specialty Board. https://doi.org/10.5001/omj.2015.48

Josephine Ozioma, E.-O., & Antoinette Nwamaka Chinwe, O. (2019). Herbal Medicines in African Traditional Medicine. *Herbal Medicine*. https://doi.org/10.5772/INTECHOPEN.80348

Krsnik, S., & Erjavec, K. (2024). Factors Influencing Use of Medicinal Herbs. *Journal of Patient Experience*, *11*. https://doi.org/10.1177/23743735241241181

Laelago, T., Yohannes, T., & Lemango, F. (2016). Prevalence of herbal medicine use and associated factors among pregnant women attending antenatal care at public health facilities in Hossana Town, Southern Ethiopia: Facility based cross sectional study. *Archives of Public Health*, *74*(1), 1–8. https://doi.org/10.1186/S13690-016-0118-Z,

Larle, F. K., Pwamang, E., Atampoka, A. P., Nang, R. V., Azaabono, J., Atrime, R., Balanjima, I., Dotse, B. P., Ayamdor, T. W., Daplah, F. M., Ndianwu, S. Y., Zuuri, C. N., Amponsah, R., Adugbire, D. A., & Mustapha, M.-M. (2025). Herbal Remedy Use during Pregnancy: A Phenomenological Study in Sagnarigu Municipality, Ghana. *Asian Journal of Pregnancy and Childbirth*, *8*(1), 180–191. https://doi.org/10.9734/ajpcb/2025/v8i1157

Makombe, D., Mboma, A., Mwakilama, E., & Banda, K. J. (2024). Information sources and factors influencing the use of herbal medicine among women during pregnancy and childbirth in rural Lilongwe, Malawi: A qualitative study. *International Journal of Population Studies*, *10*(3), 34–45. https://doi.org/10.36922/ijps.0296

Makombe, D., Thombozi, E., Chilemba, W., Mboma, A., Banda, K. J., & Mwakilama, E. (2023a). Herbal medicine use during pregnancy and childbirth: perceptions of women living in Lilongwe rural, Malawi – a qualitative study. *BMC Women’s Health*, *23*(1), 228. https://doi.org/10.1186/S12905-023-02387-Z

Makombe, D., Thombozi, E., Chilemba, W., Mboma, A., Banda, K. J., & Mwakilama, E. (2023b). Herbal medicine use during pregnancy and childbirth: perceptions of women living in Lilongwe rural, Malawi – a qualitative study. *BMC Women’s Health*, *23*(1). https://doi.org/10.1186/s12905-023-02387-z

Maldonado Miranda, J. J. (2021). Medicinal plants and their traditional uses in different locations. *Phytomedicine: A Treasure of Pharmacologically Active Products from Plants*, 207–223. https://doi.org/10.1016/B978-0-12-824109-7.00014-5

Mawoza, T., Nhachi, C., & Magwali, T. (2019a). Prevalence of Traditional Medicine Use during Pregnancy, at Labour and for Postpartum Care in a Rural Area in Zimbabwe. *Clinics in Mother and Child Health*, *16*(2), 321. https://doi.org/10.24105/2090-7214.16.321

Mawoza, T., Nhachi, C., & Magwali, T. (2019b). Prevalence of Traditional Medicine Use during Pregnancy, at Labour and for Postpartum Care in a Rural Area in Zimbabwe. *Clinics in Mother and Child Health*, *16*(2). https://doi.org/10.24105/2090-7214.16.321

Motti, R. (2021). Wild plants used as herbs and spices in Italy: An ethnobotanical review. In *Plants* (Vol. 10, Issue 3, pp. 1–14). MDPI AG. https://doi.org/10.3390/plants10030563

Motti, R., Marotta, M., Bonanomi, G., Cozzolino, S., & Di Palma, A. (2023). Ethnobotanical Documentation of the Uses of Wild and Cultivated Plants in the Ansanto Valley (Avellino Province, Southern Italy). *Plants*, *12*(21). https://doi.org/10.3390/plants12213690

Mudonhi, N., & Nunu, W. N. (2022). Traditional Medicine Utilisation Among Pregnant Women in Sub-saharan African Countries: A Systematic Review of Literature. *Inquiry (United States)*, *59*. https://doi.org/10.1177/00469580221088618/ASSET/806614F2-06AC-49C3-A699-53F245CB6841/ASSETS/IMAGES/LARGE/10.1177\_00469580221088618-FIG1.JPG

Osman, A., Larle, F. K., Atampoka, A. P., Iddrisu, S., Issah, S., Seidu, M. G., Akpablie, F. E., Zulaiha, S., Gyeng, B. B., & Amoah, D. (2025). A Qualitative Exploration of Factors Influencing Caesarean Section Acceptance among Pregnant Women in the Tamale Metropolis, Ghana. *Asian Journal of Pregnancy and Childbirth*, *8*(1), 57–68. https://doi.org/10.9734/ajpcb/2025/v8i1148

Salm, S., Rutz, J., van den Akker, M., Blaheta, R. A., & Bachmeier, B. E. (2023). Current state of research on the clinical benefits of herbal medicines for non-life-threatening ailments. *Frontiers in Pharmacology*, *14*, 1234701. https://doi.org/10.3389/FPHAR.2023.1234701/XML

Sarecka-Hujar, B., & Szulc-Musioł, B. (2022). Herbal Medicines—Are They Effective and Safe during Pregnancy? *Pharmaceutics*, *14*(1), 171. https://doi.org/10.3390/PHARMACEUTICS14010171

Sharifi, F., Jamali, J., & Roudsari, R. L. (2024a). The Prevalence of Complementary and Alternative Medicine Use among Infertile Patients: A Global Systematic Review and Meta-Analysis. In *International Journal of Fertility and Sterility* (Vol. 18, Issue 4, pp. 314–322). Royan Institute (ACECR). https://doi.org/10.22074/ijfs.2024.2005352.1482

Sharifi, F., Jamali, J., & Roudsari, R. L. (2024b). The Prevalence of Complementary and Alternative Medicine Use among Infertile Patients: A Global Systematic Review and Meta-Analysis. In *International Journal of Fertility and Sterility* (Vol. 18, Issue 4, pp. 314–322). Royan Institute (ACECR). https://doi.org/10.22074/ijfs.2024.2005352.1482

Srivastava, A., Srivastava, P., Pandey, A., Khanna, V. K., & Pant, A. B. (2018). Phytomedicine: A Potential Alternative Medicine in Controlling Neurological Disorders. *New Look to Phytomedicine: Advancements in Herbal Products as Novel Drug Leads*, 625–655. https://doi.org/10.1016/B978-0-12-814619-4.00025-2

Sumankuuro, J., Soyen, C., Crockett, J., Ibrahim, M., Ngmenkpieo, F., Wulifan, J. K., Sumankuuro, J., Soyen, C., Crockett, J., Ibrahim, M., Ngmenkpieo, F., & Wulifan, J. K. (2020). Women’s Motivation and Associated Factors for Herbal Medicine Use during Pregnancy and Childbirth: A Systematic Review. *Health*, *12*(6), 572–597. https://doi.org/10.4236/HEALTH.2020.126044

Uakarn, chanuan, Chaokromthong, K., & Sintao, N. (2021). Sample Size Estimation using Yamane and Cochran and Krejcie and Morgan and Green Formulas and Cohen Statistical Power Analysis by G\*Power and Comparisions. *APHEIT International Journal of Interdisciplinary Social Sciences and Technology*, *10*(2), 76–86. https://so04.tci-thaijo.org/index.php/ATI/article/view/254253

Wang, H., Chen, Y., Wang, L., Liu, Q., Yang, S., & Wang, C. (2023). Advancing herbal medicine: enhancing product quality and safety through robust quality control practices. In *Frontiers in Pharmacology* (Vol. 14). Frontiers Media SA. https://doi.org/10.3389/fphar.2023.1265178

Zaidi, S. F., Saeed, S. A., Khan, M. A., Khan, A., Hazazi, Y., Otayn, M., Rabah, M., & Daniyal, M. (2022). Public knowledge, attitudes, and practices towards herbal medicines; a cross-sectional study in Western Saudi Arabia. *BMC Complementary Medicine and Therapies*, *22*(1), 1–15. https://doi.org/10.1186/S12906-022-03783-Y/TABLES/6