Interdisciplinary Research in Medical Sciences Specialty
ISSN: 3062-4401
2025, Volume 5, Issue 1, Page No: 121-133

Available online at: www.galaxypub.co/page/journals

Galaxy Publication

Prevalence and Determinants of Self-Medication with Conventional and Herbal Medicines Among Pregnant Women Attending Antenatal Care at Mizan-Tepi University Teaching Hospital, Southwest Ethiopia"

Farah Siddiqui[1], Adeel Qureshi[1], Salman Riaz[1]*

[1]Department of Medical Biotechnology, Faculty of Medicine, Aga Khan University, Karachi, Pakistan.

***E-mail** ✉ salman.riaz.mb@gmail.com

Received: 14 January 2025; **Revised:** 28 March 2025; **Accepted:** 04 April 2025

ABSTRACT

Self-medication with conventional and/or herbal medicines during pregnancy may pose significant risks, potentially leading to health complications or even death for both the mother and the fetus. The present study aimed to assess the prevalence of self-medication and identify the factors influencing the use of conventional and herbal medicines among pregnant women attending antenatal care (ANC) follow-up at Mizan-Tepi University Teaching Hospital (MTUTH) in Southwest Ethiopia. A cross-sectional study was carried out between January 1 and February 30, 2022, involving 264 pregnant women attending antenatal care at Mizan-Tepi University Teaching Hospital (MTUTH). Eligible participants were randomly selected using a lottery technique. Data collection was conducted using a structured questionnaire administered through face-to-face interviews. The collected data were then entered and analyzed with SPSS version 24. To identify factors influencing self-medication with conventional and herbal medicines, bivariate analysis was conducted first, followed by multivariate logistic regression. Statistical significance in the multivariate analysis was determined at a p-value of less than 0.05. The findings indicated that 44.3% of the participants practiced self-medication with conventional drugs, whereas 49.2% reported using herbal remedies. Pregnant women without a previous history of self-medication were significantly less likely to use conventional medicines compared to those with prior experience (AOR: 6.69; 95% CI: 3.847–11.659). Absence of health insurance appeared to increase the likelihood of conventional self-medication by approximately 46% (AOR: 0.687; 95% CI: 0.373–1.264). Higher education, specifically college or university attendance, was associated with a greater tendency toward self-medication than among women without formal schooling (AOR: 0.656; 95% CI: 0.304–1.414). Furthermore, factors such as gravidity, educational attainment, and previous use of herbal medicines were linked to the practice of self-medication with herbal remedies among pregnant women. Based on the current study findings, self-medication among pregnant women is highly prevalent. Therefore, educating and counseling pregnant women and their partners during antenatal care (ANC) visits should be prioritized to reduce the potential risks associated with self-medication.

Keywords: Modern medicine, Self-medication, MTUTH, Herbal medicine, ANC, Pregnant women

How to Cite This Article: Siddiqui F, Qureshi A, Riaz S. Prevalence and Determinants of Self-Medication with Conventional and Herbal Medicines Among Pregnant Women Attending Antenatal Care at Mizan-Tepi University Teaching Hospital, Southwest Ethiopia". Interdiscip Res Med Sci Spec. 2025;5(1):121-33. https://doi.org/10.51847/g6L57uJesp

Introduction

Self-medication refers to the use of pharmaceutical products without professional authorization, whether to address symptoms or illnesses identified by the individual or through the unsupervised continuation or irregular use of previously prescribed treatments for chronic or recurrent conditions [1-3]. The term is also used more broadly to describe the misuse of substances for the relief of various health problems, including psychological and neurological disorders such as anxiety, pain, and insomnia [4].

Although self-medication is a widespread global phenomenon, occurring across diverse demographic groups, pregnant women remain a particularly vulnerable population. Many expectant mothers resort to self-medication

to alleviate discomforts or illnesses associated with pregnancy. However, medication use during pregnancy requires special caution to prevent adverse outcomes for both the mother and the fetus; consequently, unsupervised drug use during this period may heighten the risk of maternal and fetal morbidity and mortality [5].

In low-resource settings such as Ethiopia, where healthcare infrastructure and access to qualified professionals remain limited, the probability of self-medication with either conventional or herbal remedies is assumed to be high. Despite the availability of numerous medications known to be unsafe during pregnancy, awareness among pregnant women regarding these contraindications and their potential consequences is generally low [6]. Evidence supporting the safety and effectiveness of herbal remedies in pregnancy is also inadequate and often inconclusive [7].

Experimental in vivo studies illustrate potential risks; for instance, ginger (Zingiber officinale)—a commonly used medicinal plant—has been shown to induce subfertility and abortion in mice at doses of 1 g/kg or above [8]. A study from Pakistan reports that women seeking to terminate pregnancy may consume up to 2 g of ginger daily for this purpose [9]. For many other herbal preparations, available data remain inconsistent, producing contradictory findings and preventing firm conclusions [10].

A recent systematic review estimated that the prevalence of self-medication practices in Ethiopia ranges from 12.8% to 77.1%, with an average of 36.8%. Painkillers/antipyretics, antibacterials, and medications targeting gastrointestinal and respiratory ailments were the most frequently used drug categories for addressing symptoms such as fever, pain, and various infections [11]. Similarly, reports from sub-Saharan Africa show that the use of herbal remedies during pregnancy varies widely—from 2% in Tigray, Ethiopia, to 100% in Machakos, Kenya [12]. High variability is also seen in high-income countries, where prevalence estimates range from 0.1% in Europe to nearly 100% in the United States [13].

Despite growing attention to the hazards posed by unsupervised medication use during pregnancy, local data in Ethiopia remain scarce, and no study has previously assessed this issue in the present study area. Therefore, this investigation seeks to determine the prevalence of self-medication—both conventional and herbal—and to identify the factors.

Materials and Methods

Study area and period

This study was conducted at Mizan-Tepi University Teaching Hospital (MTUTH) in Aman Town, Southwest Ethiopia, located approximately 568 km from Addis Ababa. MTUTH is a major teaching and referral facility providing services to residents of Mizan-Aman and surrounding districts, with an estimated catchment population exceeding 2.75 million. Data collection took place in the hospital's ANC clinic from January 1st to February 30th, 2022.

Study design

A cross-sectional study was undertaken, during which pregnant women attending ANC services at MTUTH were interviewed using a standardized questionnaire.

Study population

The study population comprised all pregnant women who visited the ANC clinic during the study period, were mentally stable, and voluntarily consented to participate. Pregnant women with mental illness or those judged to be mentally unstable were excluded from the study.

Sample size determination and sampling technique

To determine the sample size, the single population proportion formula was applied:

$$n = \frac{Z^2(1-P)P}{d^2} \quad (1)$$

where n represents the required sample size, P is the estimated prevalence of self-medication among pregnant women, d is the acceptable margin of error, and Z corresponds to the 95% confidence level.

A previous study conducted in 2015 among 353 pregnant women attending antenatal care in Hosanna town, Southern Ethiopia, reported a 73.1% prevalence of herbal medicine use [14], which was used as the estimated prevalence for this study. Using this value, the initial sample size was calculated as:
So, n= [(1.96)2 (1 − 0.731)∗0.731]/(0.05)2 = [3.8416∗0.1966]/0.0025 = 302.
Because the total population of pregnant women attending ANC at MTUTH was 1,512, which is less than 10,000, the sample size was adjusted using the finite population correction:

$$nf = \frac{n}{1 + \frac{n}{N}} = nf = \frac{302}{1 + \frac{302}{1512}} = 251.67 \quad (2)$$

After accounting for a 5% non-response rate, the final sample size was set at 264. Participants who met the inclusion criteria were selected through a simple random sampling technique using a lottery method."

Data collection tool and procedure
Data collection was carried out using a structured questionnaire administered through face-to-face interviews. The questionnaire included all relevant variables and was divided into four sections. The first section captured socio-demographic information, while the second, third, and fourth sections addressed obstetric characteristics, previous self-medication practices, and current use of conventional and herbal medicines, respectively. Two final-year pharmacy students collected the data under the daily supervision of the principal investigator."

Data quality control, processing, and analysis
"A pretest was conducted on 5% of the study population to enhance the validity and reliability of the questionnaire, and any identified issues were subsequently addressed. The collected data were reviewed daily for completeness and consistency before being entered and analyzed using SPSS version 24. Descriptive statistics were used to calculate frequencies and percentages of the variables. To identify factors associated with self-medication using conventional and herbal medicines, bivariate analysis was first performed, and variables with a p-value <0.25 were included in the multivariate logistic regression. In the multivariate analysis, predictor variables with a p-value <0.05 were considered significantly associated with the outcome. Graphical representations of the data were created using GraphPad Prism version 8.4.3.

Definitions of terms

Herbs
Any part of a plant—including leaves, fruits, flowers, seeds, stems, bark, rhizomes, roots—or materials derived from soil.

Herbal medicine
A medicinal plant or blend of plants utilized in humans for managing, preventing, or relieving diseases and associated symptoms.

Current pregnancy
Refers to women who were pregnant at the time of data collection.

Ethical consideration
Approval for this study was granted by the Mizan-Tepi University Research and Ethical Review Committee (MTU/CMHS/01357/14). Participants were informed about the purpose of the study before data collection, and written consent was obtained. Confidentiality of the information was maintained, and participants were allowed to ask questions or opt out of the study at any point."

Results and Discussion

Socio-demographic characteristics of the respondents

The study included 264 pregnant women, all of whom provided complete responses. The majority of participants (44.7%) were aged 23–28 years, with a median age of 25.5 years, and nearly all (95.1%) were married. In terms of occupation, 46.2% were homemakers, and 73.1% reported low monthly income according to the WHO income classification. Regarding educational status, 78 participants (29.5%) had completed primary education (grades 1–8). Ethnically, 107 participants (40.5%) were Bench, and 120 (45.5%) identified as Protestant **(Table 1)**.

Table 1. Demographic and social characteristics of expectant mothers receiving antenatal care at MTUTH during the period of January to February 2022 (total participants = 264).

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	17–22	83	31.4
	23–28	118	44.7
	29–34	48	18.2
	≥35	15	5.7
Marital Status	Married	251	95.1
	Widowed	1	0.4
	Single	4	1.5
	Divorced	8	3.0
Monthly Income (ETB)	<1380 (poor)	193	73.1
	1381–6900 (low)	70	26.5
	6901–13800 (mid)	1	0.4
Occupation	Government-employed	47	17.8
	Self-employed	16	6.1
	Housewife	122	46.2
	Farmer	26	9.8
	Student	53	20.1
Educational Level	Illiterate	45	17.0
	Primary School	78	29.5
	Secondary School	69	26.1
	College/University	72	27.3
Ethnicity	Bench	107	40.5
	Amhara	102	38.6
	Kafa	33	12.5
	Others	22	8.3
Religion	Orthodox	76	28.8
	Muslim	68	25.8
	Protestant	120	45.5
Residence	Urban	196	74.2
	Rural	68	25.8
Distance to Facility	<5 km	142	53.8
	5–10 km	73	27.6
	>10 km	49	18.6
Health Insurance	Yes	80	30.3
	No	184	69.7

classification is according to the WHO income level scale for developing countries; ETB, Ethiopian birr.

Obstetric information of the respondents

Of the 264 pregnant women included in the study, over one-third (36.7%) were in their second pregnancy, and nearly a quarter (22.3%) were in their third or higher pregnancy. Looking specifically at women with two or more

pregnancies (n = 196), one-third had only one child, while 18.6% had three or more children. Additionally, 16.3% of these women reported a history of previous abortion **(Table 2)**.

Table 2. Obstetric characteristics of pregnant women attending antenatal care at MTUTH, January–February 2022 (n = 264)

Variable	Category	Frequency (n)	Percentage (%)
Number of Pregnancies (Gravidity)	One	68	25.8
	Two	97	36.7
	Three	40	15.2
	More than three	59	22.3
	Total	264	100
Number of Children (Parity)	No child	84	31.8
	One child	87	33.0
	Two children	44	16.6
	More than two	49	18.6
	Total	264	100
History of Abortion	No	221	83.7
	Yes	43	16.3
	Total	264	100
Stage of Pregnancy	First trimester	46	17.4
	Second trimester	120	45.5
	Third trimester	98	37.1
	Total	264	100

As illustrated in **(Figure 1)**, among the 43 pregnant women with a history of prior abortion, 19 (44.2%) were attributed to unknown illnesses, while 9 (20.9%) were associated with the use of unspecified medications, and 8 (18.6%) were related to unwanted pregnancies.

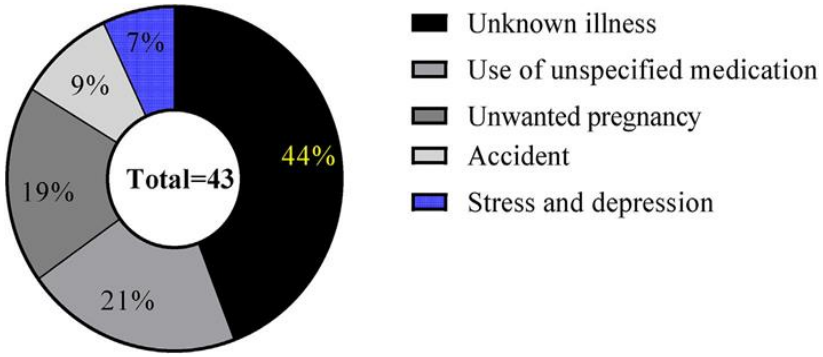

Figure 1. Causes of previous abortion among pregnant women attending ANC at MTUTH, January–February 2022 (n = 43).

Self-medication practice with modern medicines

Among the study participants, 117 (44.3%) reported practicing self-medication with modern medicines during their current pregnancy. Additionally, of the 196 multigravida women, 130 (66.3%) had self-medicated during previous pregnancies. The most commonly cited reasons for using modern medicines without medical supervision were easy availability or accessibility of drugs (44.4%), saving time (19.7%), and prior experience with the medication (14.5%).

Among the 147 participants who did not engage in self-medication during their current pregnancy, 39 (26.5%) and 34 (23.1%) refrained due to concerns that it could harm the fetus or lead to abortion, respectively. Furthermore, 26 women (17.7%) avoided self-medication based on guidance received from health extension workers **(Figure 2)**.

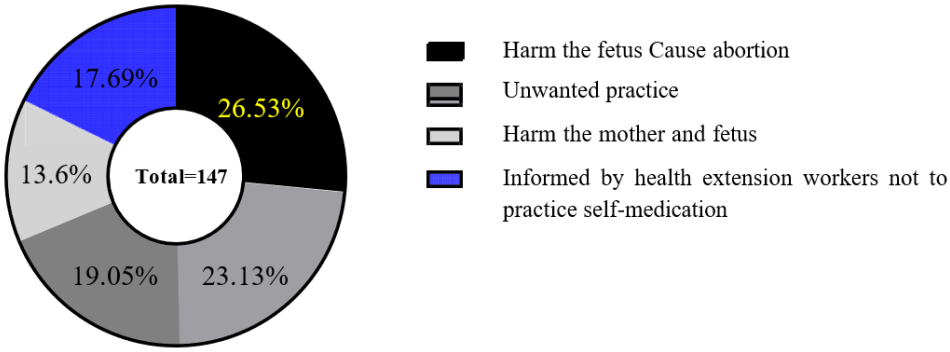

Figure 2. Reasons for not practicing self-medication among pregnant women attending ANC at MTUTH, January–February 2022 (n = 147).

Among the 117 women who self-medicated during their current pregnancy, 52.1% reported using medication to relieve headaches, followed by 14.5% for common colds **(Table 3)**. As shown in **(Figure 3)**, the most frequently used drugs were paracetamol (39.3%), diclofenac (17.1%), and amoxicillin (12.8%). A small portion of participants (7.7%) were unable to recall the specific medications they had used.

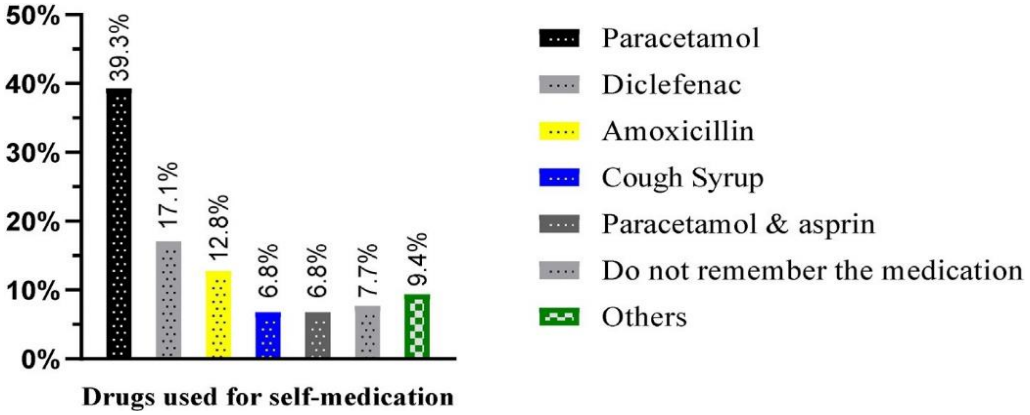

Figure 3. Distribution of modern drugs reportedly self-administered by pregnant women attending ANC at MTUTH, January–February 2022 (n = 117).

Table 3. Reasons cited by pregnant women at MTUTH (n = 117) for engaging in self-medication, January–February 2022.

Indication	Frequency (n)	Percentage (%)
Headache	61	52.1
Common cold	17	14.5
Headache and cough	13	11.1
Cough and diarrhea	10	8.6
Other indications*	16	13.7
Total	117	100

@thyphoid, UTI, diarrhea, headache + common cold, NV + common cold, H + N.

Among pregnant women who reported self-medicating during their current pregnancy, 33.3% indicated that they relied on their own judgment as the primary source of information, while 23.9% cited guidance from their husbands **(Figure 4)**. The majority of participants (74.4%) obtained the medications from community drug retail outlets (CDROs), and 12.0% purchased them from local shops **(Figure 5)**. Notably, over half of these women (58.97%) had no knowledge about the medications they were taking, whereas 24.8% were aware of the proper method of administration, and 15.4% knew the correct dosage.

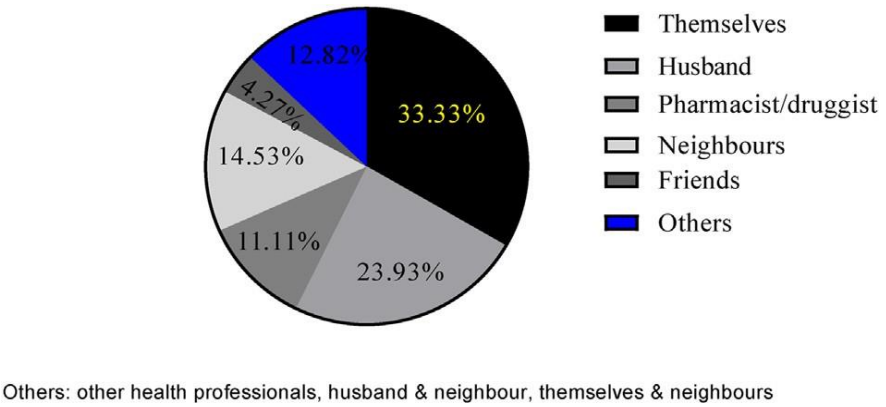

Figure 4. Channels through which pregnant women at MTUTH (n = 117) obtained information leading to self-medication with modern medicines, January–February 2022.

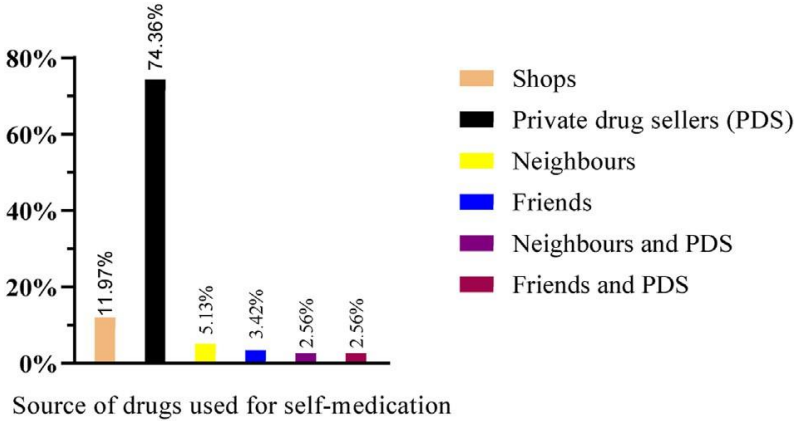

Figure 5. Distribution of sources from which pregnant women obtained modern drugs for self-medication at ANC, MTUTH, January–February 2022 (n = 117).

Factors associated with self-medication practice using modern medicine.

The analysis using multivariate logistic regression showed that current self-medication with modern medicines among pregnant women was significantly associated with their educational attainment, insurance status, and history of prior self-medication. Women who had never self-medicated before were substantially less likely to engage in self-medication during their current pregnancy compared with those who had a previous history (AOR: 6.69; 95% CI: 3.847–11.659). Lack of health insurance was linked to a higher likelihood—approximately 46%—of practicing self-medication (AOR: 0.687; 95% CI: 0.373–1.264). Moreover, women with college or university education were more inclined to self-medicate than those without formal education, in contrast to women who had only completed primary or secondary schooling (AOR: 0.656; 95% CI: 0.304–1.414) **(Table 4)**.

Table 4. Key factors associated with self-medication using modern medicines among pregnant women attending ANC at MTUTH, January–February 2022.

Variable	Category	Self-Medication Yes (n, %)	Self-Medication No (n, %)	COR (95% CI)	AOR (95% CI)
Occupation	Government employed	18 (15.4%)	29 (19.7%)	1.0	1.0
	Self-employed	8 (6.8%)	8 (5.4%)	0.621 (0.198–1.946)	0.375 (0.13–1.08)
	Housewife	58 (49.6%)	64 (43.5%)	0.685 (0.345–1.362)	0.891 (0.24–3.27)
	Farmer	14 (12.0%)	12 (8.2%)	0.532 (0.202–1.403)	0.795 (0.324–1.95)
	Student	19 (16.2%)	34 (23.2%)	1.1 (0.493–2.5)	0.632 (0.16–2.48)
Education	Illiterate	26 (22.2%)	19 (12.9%)	1.0	1.0
	Primary school	39 (33.3%)	39 (26.5%)	1.368 (0.653–2.867)	1.713 (0.737–3.98) *

	Secondary school	22 (18.8%)	47 (32.0%)	2.923 (1.34–6.369)	1.313 (0.636–2.709) ∗
	College/University	30 (25.6%)	42 (28.6%)	1.916 (0.9–4.07)	0.656 (0.304–1.414) ∗
Insurance	Yes	29 (24.8%)	51 (34.7%)	1.0	1.0
	No	88 (75.2%)	96 (65.3%)	0.62 (0.362–1.064)	0.687 (0.373–1.264) ∗
Stage of Pregnancy	First trimester	22 (18.8%)	24 (16.3%)	1.0	1.0
	Second trimester	56 (47.9%)	64 (43.6%)	1.048 (0.53–2.069)	0.892 (0.387–2.055)
	Third trimester	39 (33.3%)	59 (40.1%)	1.387 (0.685–2.809)	0.986 (0.527–1.845)
Prior Self-Medication	Yes	87 (74.4%)	43 (29.3%)	1.0	1.0
	No	30 (25.6%)	104 (70.7%)	7.0 (4.06–12.1)	6.69 (3.847–11.659) ∗

The predicted probability refers to not engaging in self-medication with modern medicines; ∗ denotes statistical significance at $p \leq 0.05$.

Self-medication practice using herbal medicines

Nearly half of the participants (130, 49.2%) reported using herbal medicines during their current pregnancy. Among the 196 multigravida women, 95 (48.5%) had a history of herbal medicine use in previous pregnancies. Of the 134 women who did not use herbal medicines in their current pregnancy, the largest proportion (41.8%) considered herbal use undesirable, while 17.9% were concerned that it might pose risks to the fetus **(Table 5)**."

Table 5. Reported reasons for abstaining from herbal medicine use among pregnant women at ANC, MTUTH, January–February 2022 (n = 134).

Reason	Frequency (N)	Percentage (%)
Considered an undesirable practice	56	41.79
Concern about potential harm to the fetus	24	17.9
Lack of knowledge about using herbal remedies	19	14.2
Risk of causing abortion	18	13.43
Potential harm to both mother and fetus	8	5.97
Difficulty in determining the correct dosage	7	5.22
May harm fetus due to lack of knowledge	1	0.75
May cause abortion and harm the fetus	1	0.75
Total	134	100

Among pregnant women who used herbal medicines during their current pregnancy, 44 (33.8%) believed that these remedies have fewer side effects, while 23.1% considered them more beneficial than prescription drugs **(Figure 6)**. The most common reasons for using herbal medicines were to alleviate nausea and vomiting (30.0%) and to treat the common cold (26.9%). The herbs most frequently used included dama-kesse (Ocimum lamiifolium) (22.3%), ginger (Zingiber officinale) (17.7%), and garlic (Allium sativum) (16.2%) **(Table 6)**.

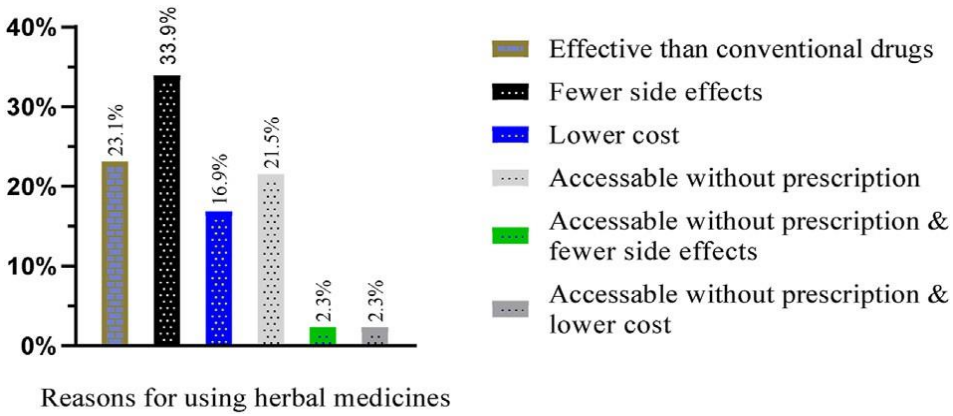

Figure 6. Reported reasons for herbal medicine use among pregnant women at ANC, MTUTH, January–February 2022 (n = 130).

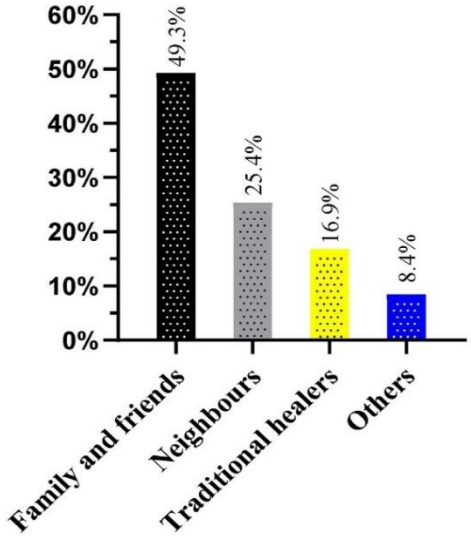

Figure 7. Reported sources of information on herbal medicine use among pregnant women at ANC, MTUTH, January–February 2022 (n = 130).

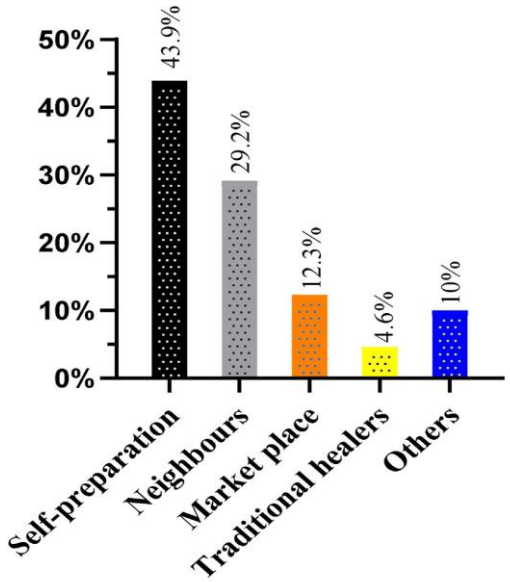

Figure 8. Origins of herbal products used for self-medication among pregnant women at MTUTH ANC (n = 130), January–February 2022.

Table 6. Reported indications and types of herbs used by pregnant women at ANC, MTUTH, January–February 2022 (n = 130).

Reason	Frequency (N)	Percentage (%)
Considered an undesirable practice	56	41.8
Concern about potential harm to the fetus	24	17.9
Lack of knowledge about using herbal remedies	19	14.2
Risk of causing abortion	18	13.4
Other reasons	17	12.7
Total	134	100

©: common cold + prevent abortion, NV + CC, prevent abortion + NV, H + CC,
♀: allergic, diarrhea, typhoid…
☼: garlic and tena-adam, dama-kesse and tosign, ginger and dama-kesse .

Table 7. Reported uses and preparation of herbal medicines by pregnant mothers attending ANC at MTUTH, from January to February 2022, (n = 130).

Herb	Uses Reported by Pregnant Women	Preparation Method
Ginger (*Zingiber officinale*)	Alleviates morning sickness, aids digestion, and treats cold/cough	Fresh ginger, sliced or grated, steeped in hot water (tea)
Garlic (*Allium sativum*)	Treats common cold and flu; may help prevent preeclampsia	Added to food dishes
Dama-kesse (*Ocimum lamiifolium*)	Relieves headache, fever, high blood pressure, and flank pain	Leaves sniffed or squeezed into tea or coffee
Tena Adam (*Ruta chalepensis*)	Treats headache, fever, and common cold	Fresh leaves added to tea or coffee
Tosign (*Thymus schimperi*)	Relieves cough and stomach discomfort; also used for flavoring	Fresh herb boiled in tea

Factors contributing to self-medication practice with herbal medicines

The multivariate logistic regression analysis showed that the use of herbal medicines among pregnant women was significantly influenced by gravidity, prior experience with herbal remedies, and level of education. Women in their second pregnancy were considerably less likely to self-medicate with herbal products compared to first-time mothers (AOR: 23.14; 95% CI: 0.94–568.9). Similarly, those who had never used herbal medicines before were much less likely to engage in such practices (AOR: 26.95; 95% CI: 10.75–67.52). The analysis also indicated that among educated participants, women with college or university-level education were more prone to self-medicate with herbal remedies than those with no formal schooling **(Table 8)**.

Table 8. Factors influencing the use of herbal medicines among pregnant women attending ANC at MTUTH, January–February 2022.

Variable	Herbal Medicine Use	Bivariate Analysis (COR, 95% CI)	Multivariate Analysis (AOR, 95% CI)
Education			
Illiterate	34 (26.2%) Yes / 11 (8.2%) No	1.0	1.0
Primary school	38 (29.2%) / 40 (29.9%)	3.25 (1.45–7.33)	3.99 (1.18–13.44) ∗
Secondary school	28 (21.5%) / 41 (30.6%)	4.97 (1.97–10.4)	1.33 (0.6–2.94) ∗
College/University	30 (23.1%) / 42 (31.3%)	4.33 (1.89–9.88)	0.83 (0.38–1.80) ∗
Place of Residence			
Urban	87 (66.9%) / 109 (81.3%)	1.0	1.0
Rural	43 (33.1%) / 25 (18.7%)	0.46 (0.26–0.82)	0.99 (0.45–2.17)
Number of Gravidities			
One	20.8% / 30.6%	1.0	1.0
Two	33.8% / 39.6%	0.79 (0.42–1.48)	23.15 (0.94–568.9) ∗
Three	18.5% / 11.9%	0.44 (0.98–0.97)	3.47 (0.22–54.78) ∗
More than three	26.9% / 17.9%	0.45 (0.22–0.92)	5.15 (0.57–46.18) ∗
Number of Children			
No child	26.1% / 37.3%	1.0	1.0
One child	31.5% / 34.3%	0.76 (0.42–1.39)	0.34 (0.02–7.49)
Two children	17.7% / 15.7%	0.62 (0.30–1.3)	0.29 (0.02–4.6)
More than two	24.6% / 12.7%	0.36 (0.17–0.75)	0.36 (0.045–2.87)
Prior Herbal Medicine Use			
Yes	73.8% / 23.1%	1.0	1.0
No	26.2% / 76.9%	9.38 (5.36–16.4)	26.95 (10.75–67.52) ∗

The predicted probabilities represent the likelihood of abstaining from herbal medicine self-medication; ∗ denotes statistical significance at $p \leq 0.05$.

During pregnancy, various physiological changes often trigger discomforts or illnesses that prompt many women to self-medicate. The aim of this study was to evaluate the prevalence of self-medication (both conventional drugs and herbal remedies) and its associated factors among expectant mothers attending antenatal care at Mizan-Tepi University Teaching Hospital (MTUTH).

Self-medication with modern drugs was reported by 44.32% of women in the current pregnancy and by 66.32% in previous pregnancies. These rates exceed those documented at Jimma University Specialized Hospital (20.1% current, 63.7% previous) [15], Goba town (15.5%) [16], and Gedeo Zone (40.4%) [17], yet remain below the 85% reported in Jos, Nigeria [6] and 61.3% in Bukavu, DR Congo [5]. A Tanzanian study found a very close figure of 46.24% [18]. Disparities in prevalence may arise from variations in socioeconomic backgrounds, drug regulation policies, cultural beliefs, and healthcare accessibility.

The primary motives for choosing conventional self-medication were convenient drug availability (44.44%) and the desire to save time (19.66%)—reasons also highlighted in studies from Jimma [15], Bahir Dar [19], and Jos, Nigeria [6]. Headache (52.14%), common cold (14.53%), and cough (11.1%) emerged as the leading conditions treated, aligning with patterns observed in Kemisie [20], Jimma [15], Harar [21], DR Congo [5], and Nigeria [6]. Paracetamol (39%), diclofenac (17.01%), and amoxicillin (12.82%) ranked as the most frequently used drugs, consistent with reports from Goba [16], Gedeo Zone [17], Jimma [22], and DR Congo [5]. Private drug retail outlets served as the main supply source for 74.36% of users, a finding echoed in Jimma (72.1%) [15] and Kemisie (50%) [20], underscoring the need for tighter regulation of these outlets.

Women without prior self-medication experience were roughly 6.7 times less likely to self-medicate with conventional medicines (AOR 6.69; 95% CI 3.85–11.66). Lack of health insurance raised the odds by about 46% (AOR 0.687; 95% CI 0.37–1.26), and, surprisingly, higher education (college/university level) was linked to greater likelihood of self-medication compared to no formal education (AOR 0.656; 95% CI 0.30–1.41).

Herbal remedy use stood at 49.2% during the current pregnancy and 48.5% during past pregnancies—lower than Harar (58.2% and 63.2%) [21] but comparable to Kemisie (49.8%) [20], Nekemte (50.4%) [23], and Malaysia (51.4%) [24]. Rates were higher than Kenya (12%) [25] and Saudi Arabia (33%) [26] yet lower than Hosanna, Ethiopia (73.1%) [14] and Ibadan, Nigeria (63.8%) [27].

Among non-users, the chief reasons for avoidance were considering it undesirable (41.79%), concern about fetal harm (17.9%), and insufficient knowledge (14.2%). Users mainly cited fewer perceived side effects (33.85%), better effectiveness (23.08%), and easy access without prescription (21.54%). Nausea/vomiting, common cold, and headache were the top indications, mirroring results from Nekemte [23] and Hosanna [14].

The most popular herbs were dama-kesse (Ocimum lamiifolium) (22.31%), ginger (Zingiber officinale) (17.69%), and garlic (Allium sativum) (16.31%). Ginger tea was taken for morning sickness, cough, and digestion; dama-kesse for headache, fever, and hypertension; and garlic for colds and preeclampsia prevention—practices backed by traditional use and some scientific studies [10, 12, 28-30].

The likelihood of herbal self-medication dropped significantly among women with no previous herbal use, those with higher parity, and those with more years of education—patterns also noted in Bangladesh [31], Gondar [32], Bahir Dar [19], Turkey [33], and Australia [34].

Limitation of the study

The use of a cross-sectional study design restricts the ability to draw causal inferences between the identified predictors and the outcomes. In addition, because the information was obtained through participant interviews, the results may be influenced by recall bias. These limitations should be taken into account when interpreting the findings of this study.

Conclusion

Self-medication during pregnancy was common, with 44.3% of women using conventional medicines and 49.2% using herbal remedies. The primary reasons for self-medicating with modern drugs were ease of access and saving time, while herbal remedies were primarily used due to perceptions of lower side effects and greater effectiveness. The most frequently used conventional medications were diclofenac, paracetamol and amoxicillin, whereas ginger garlic (Allium sativum), (Zingiber officinale), dama-kesse (Ocimum lamiifolium) and were the predominant herbal products. Use of modern medicines was significantly associated with education level, health insurance status, and prior experience with self-medication ($P < 0.05$). Similarly, gravidity, education level, and previous

use of herbal remedies were significant factors influencing herbal self-medication ($P < 0.05$). Overall, these findings highlight the importance of educating and counseling pregnant women during antenatal care visits about the potential risks of self-medicating with both conventional and herbal medicines.

Acknowledgments: None

Conflict of Interest: None

Financial Support: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethics Statement: None

References

1. World Health Organization, Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication, WHO, 2000. https://apps.who.int/iris/bitstream/handle/10665/66154/WHO_EDM_QSM_00.1_eng.pdf
2. M. Sisay, G. Mengistu, D. Edessa, Epidemiology of self-medication in Ethiopia: a systematic review and meta-analysis of observational studies, BMC Pharmacol. Toxicol 19 (1) (2018 Sep 10).
3. F.D. Sema, D.G. Addis, E.A. Melese, D.D. Nassa, Z.D. Kifle, Prevalence and associated factors of self-medication among pregnant women on antenatal care follow-up at university of gondar comprehensive specialized hospital in Gondar, Northwest Ethiopia: a cross-sectional study, Int. J. Reprod. Med (2020 Sep 30) 1–12, 2020.
4. K.A. Bashrahil, A.S. Baruzaig, Self-medication: concept , prevalence {&} risks in Mukalla city (Yemen) 2004-2005, Andalus. Stud. Res 2 (2008) 1–14.
5. P.M. Mbarambara, P.B. Songa, L.M. Wansubi, P.M. Mututa, B.B.K. Minga, Self- medication practice among pregnant women attending antenatal care at health centers in Bukavu , Eastern DR Congo Self-medication practice among pregnant women attending antenatal care at health centers in Bukavu , Eastern DR Congo, Int. J. Innovat. Appl. Stud. 16 (1) (2016) 38–45.
6. A. Emmanuel, G. Achema, B.B. Afoi, R. Maroof, Self medicaltion practice among pregnant women attending antenatal clinic in selected hospitals in Jos, Nigeria, Int J Nurs Heal Sci 1 (6) (2014) 55–59. Available from: https://dspace.unijos.edu.ng/ jspui/handle/123456789/1648.
7. N. Bernstein, M. Akram, Z. Yaniv-Bachrach, M. Daniyal, Is it safe to consume traditional medicinal plants during pregnancy? Phyther Res. 35 (4) (2021) 1908–1924.
8. R.H. Elmazoudy, A.A. Attia, Ginger causes subfertility and abortifacient in mice by targeting both estrous cycle and blastocyst implantation without teratogenesis, Phytomedicine (2018). Available from.
9. G.M. Shah, M.A. Khan, M. Ahmad, M. Zafar, A. Khan, Observations on antifertility and abortifacient herbal drugs, Afr. J. Biotechnol. 8 (9) (2009) 1959–1964.
10. B. Sarecka-hujar, B. Szulc-Musiol, Herbal medicines — are they effective and safe during pregnancy ? Pharmaceutics (2022) 1–27.
11. M.B. Ayalew, Self-medication Practice in Ethiopia : a Systematic Review, 2017, pp. 401–413.
12. M. El Hajj, L. Holst, Herbal medicine use during pregnancy: a review of the literature with a special focus on sub-Saharan Africa, Front. Pharmacol. 11 (2020 Jun 9) 866.
13. D. Limaye, V. Limaye, G. Krause, G. Fortwengel, A systematic review of the literature to assess self-medication practices, Ann. Med. Health Sci. Res. 7 (2017) 1–15.
14. T. Laelago, T. Yohannes, F. Lemango, 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, Arch. Public Heal. 74 (1) (2016) 1–8.
15. A. Befekadu, N.H. Dekama, M. Adem, Self-medication and contributing factors among pregnant women attending antenatal care in Ethiopia, The Case of Jimma Univ. Special. Hosp. 3 (1) (2014) 969–981.

16. T. Zewdie, T. Azale, A. Shimeka, A.M. Lakew, Self-medication during pregnancy and associated factors among pregnant women in Goba town, southeast Ethiopia: a community based cross sectional study, BMC Res Notes 11 (1) (2018) 1–6.
17. S.F. Ake, G.N. Yimam, N.A. Bekele, Self-medication and its predictors among pregnant women in Gedeo zone, south Ethiopia, J. Basic Clin. Pharm. 12 (6) (2021) 60–66.
18. K.J. Marwa, A. Njalika, D. Ruganuza, D. Katabalo, E. Kamugisha, Self-medication among pregnant women attending antenatal clinic at Makongoro health centre in Mwanza, Tanzania: a challenge to health systems, BMC Preg. Childbir. 18 (16) (2018) 1–8.
19. Gedefaw Abeje, Chanie Admasie, B. Wasie, Factors associated with self medication practice among pregnant mothers attending antenatal care at governmental health centers in Bahir Dar city administration, Northwest Ethiopia, a cross sectional study, PanAfrican Med J 20 (276) (2015).
20. A. Tuha, A.G. Faris, Mohammed, Solomon Ahmed, M.Y. Gobezie, Self-medication and associated factors among pregnant women attending antenatal care at Kemisie general hospital, North East Ethiopia, Patient Prefer. Adherence 14 (2020) 1969–1978.
21. A. Jambo, G. Mengistu, M. Sisay, F. Amare, M.J. Rieder, M.L. Christensen, Self- medication and contributing factors among pregnant women attending antenatal care at public hospitals of harar town , Ethiopia, Front. Pharmacol. 9 (2018) 1–10.
22. S.M. Ahmed, J. Sundby, Y.A. Aragaw, Self-medication and safety profile of medicines used among pregnant women in a tertiary teaching hospital in Jimma , Ethiopia : a cross-sectional study, Int. J. Environ. Res. Publ. Health 17 (3993) (2020).
23. B. Bayisa, R. Tatiparthi, E. Mulisa, Use of herbal medicine among pregnant women on Antenatal care at Nekemte Hospital, Western Ethiopia, Jundishapur J. Nat. Pharm. Prod. 9 (4) (2014) 4–8.
24. A.A. Rahman, S.A. Sulaiman, Z. Ahmad, W.N.W. Daud, A.M. Hamid, Prevalance and pattern of use of herbal medicines during pregnancy in Tumpat District, Kelantan, Malays. J. Med. Sci. 15 (3) (2008) 40–48.
25. M. Mothupi, Use of herbal medicine during pregnancy among women with access to public healthcare in Nairobi, Kenya: a cross-sectional survey, BMC Compl. Alternative Med. 14 (432) (2014) 1–8. http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L601312998%0A
26. A. Mohamad, A. Suhaib, Prevalence and factors influencing use of herbal medicines during pregnancy in Hail, Saudi Arabia: a cross-sectional study, Sultan Qaboos Univ Med J 20 (1) (2020) 71–76.
27. K.B.Y.L. Omarusehe, Determinants of self medication practices among pregnant women in Ibadan , Nigeria, Int. J. Clin. Pharm. 33 (2011) 868–875.
28. I. Lete, J. Allu´e, The effectiveness of ginger in the prevention of nausea and vomiting during pregnancy and chemotherapy, Integr. Med. Insights 11 (2016) 11–1.
29. M. El Hajj, L. Holst, Herbal medicine use during pregnancy: A review of the literature with a special focus on sub-Saharan Africa, Front Pharmacol. 11(June) (2020) 1–13.
30. W. Mequanint, E. Makonnen, K. Urga, In vivo anti-inflammatory activities of leaf extracts of Ocimum lamiifolium in mice model, J Ethnopharmacol 134 (2011) 32–36.
31. M. Ahmed, J.H. Hwang, M.A.Hasan, D. Han, Herbal medicine use by pregnant women in Bangladesh: a cross-sectional study, BMC Compl. Alternative Med. 18 (1) (2018 Dec 13).
32. A. Mekuria, D. Erku, B.G. Medicine, Prevalence and associated factors of herbal medicine use among pregnant women on antenatal care follow-up at University of Gondar referral and teaching, BMC Compl. Alternative Med. 17 (86) (2017). Available from: https://link.springer.com/article/10.1186/s12906-017-1608-4.
33. A. Kıssal, Ü. Güner, D. Erturk, Use of herbal product among pregnant women in Turkey, Compl. Ther. Med. 30 (2017) 54–60.
34. J. Frawley, J. Adams, A. Steel, A.C.G. Broom, Women's use and self-prescription of herbal medicine during pregnancy: an examination of 1,835 pregnant women, Women's Heal Issues 25 (4) (2015) 396–402. Available from: https://www.scienc edirect.com/science/article/pii/S1049386715000262.