



# Self-Medication and Associated Factors Among Pregnant Women Attending Antenatal Care at Kemisie General Hospital, North East Ethiopia

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Abdu Tuha   
Abebe Getie Faris   
Solomon Ahmed Mohammed   
Mengistie Yirsaw Gobezie

Department of Pharmacy, College of  
Medicine and Health Science, Wollo  
University, Dessie, Ethiopia

**Introduction:** Self-medication is an important part of daily self-care, without the supervision of health professionals. It is commonly practiced by pregnant women all over the world and may result in maternal and fetal risks. Hence, this study assessed self-medication practices and associated factors among pregnant women attending Kemisie General Hospital.

**Methods:** A facility-based cross-sectional study was conducted using a structured questionnaire on pregnant women who were attending antenatal care at Kemisie General Hospital. A simple random sampling technique was employed to select the study participants. Descriptive and inferential statistics were computed using the Statistical Package for Social Sciences version 20.

**Results:** Among 223 pregnant women, 60 (26.9%; 95% CI: 20.9%, 32.9%) and 111 (48.9%; 95% CI: 43%, 58%) practiced self-medication on conventional and herbal medicine, respectively. The predictors of self-medication of conventional medicine among pregnant women were prior experience to the drug (P-value: 0.00, AOR=126.04, 95% CI: 32.55–488.04) and no previous history of abortion (P-value: 0.00, AOR=0.01, 95% CI: 0.002–0.04), while college educational level (P-value: 0.00, AOR=13.45, 95% CI: 3.58–50.5), history prior herbal medicine use (P-value: 0.00, AOR=9, 95% CI: 3.32–24.39), *Ruta chalepensis* (P-value: 0.001, AOR=193.7, 95% CI: 8.64–4342.1) and *Ocimum lamiifolium* type of herb use (P-value: 0.004, AOR=12.72, 95% CI: 2.27–71.38), and 5–10km health facility distance (P-value: 0.022, AOR=0.1, 95% CI: 0.01–0.73) were predictors for self-medication practice of herbal medicines among pregnant women.

**Conclusion:** Nearly one-third and two-third of pregnant women practiced self-medication on conventional and herbal medicine, respectively. Prior experience to the drug and no previous history of abortion associated with self-medication of conventional medicine, while college educational level, history prior herbal medicine use, *Ruta chalepensis* and *Ocimum lamiifolium* type of herb use, and 5–10km distance were predictors for self-medication practice of herbal medicines. Improving health service coverage and awareness creation on rational medication use is recommended to prevent fetal and maternal risks.

**Keywords:** self-medication, conventional medicine, herbal medicine, pregnant women

## Introduction

According to World Health Organization, self-medication is the treatment of self-diagnosed disorders or symptoms by use of medicines or intermittent or continued use of medicines prescribed by physicians for chronic or recurring diseases.<sup>1</sup> It is one of the basic components of self-care and includes taking of drugs, herbs or home remedies<sup>2</sup> by one's own initiative, or by the advice of another person, without consulting a doctor.<sup>3</sup>

Correspondence: Solomon Ahmed  
Mohammed  
Department of Pharmacy, College of  
Medicine and Health Science, Wollo  
University, Dessie 1145, Ethiopia  
Tel +251910504378  
Email solomon.ahmed@wu.edu.et

Self-medication is a common practice all over the world. The World Health Organization reported that about 70–80% of the world's population relies on the use of non-conventional medicines in their primary healthcare.<sup>2</sup> In developing countries, self-medication is widely practiced due to poor medical services and a lack of professional control of pharmaceutical products. This forced people to self-medicate various forms of substances and herbs that are often used for different medical complaints.<sup>4</sup> In addition, in most of the economically deprived countries, including Ethiopia, many drugs are dispensed over the counter, and nearly 60%–80% of health-related problems are treated through self-medication as a lower-cost alternative.<sup>5,6</sup>

Pregnant women's are one of the vulnerable population groups who practice self-medication frequently and repeatedly for the prevention of abortion, treatment of pregnancy-related problems such as dysmenorrhea, menopausal symptoms, menstrual disorders, mood disorders, osteoporosis, pregnancy, and prevention of anemia.<sup>7</sup>

Self-medication is commonly practiced by pregnant women due to better accessibility, affordability, and availability of herbal medicines.<sup>4</sup> Assuming natural treatment has no problem with the fetus and the mother, and better efficacy compared to modern medicine forced pregnant women to practice self-medication.<sup>7,8</sup> Moreover, the severity of illness, emergency use and prior experience of illness pushed pregnant women to self-medicate.<sup>4,9–12</sup>

Self-medication is an essential part of daily self-care and is affected by various factors such as income, local culture, age, gender, education level, knowledge, access to medicines, time, perception of risk of self-medication, previous medication use, gestational age, and occupation.<sup>6–8,13,14</sup>

Use of self-medication by pregnant women with medicine and/or herb can disturb the development of the embryo or fetus and may cause serious structural and functional adverse effects, including low birth weight, premature birth, feeding problems, respiratory problems, malformations, developmental fetal toxicity, and other potential harm to the fetus<sup>4,11,15–17</sup> and mother.<sup>4,14,18</sup> In addition, the increased practice of self-medication will exacerbates the danger of drug interaction and adverse event and results in irrational use of drugs.<sup>5</sup> Thus, it is appropriate to evaluate and know the drugs that are consumed during pregnancy.<sup>17</sup> This study was conducted to determine the pattern of self-medication and contributing factors among pregnant women attending the antenatal care (ANC) clinic of Kemisie General Hospital.

## Methods

### Study Area and Period

The study was conducted at Kemisie General Hospital, Kemisie town, North East Ethiopia, from April 20 to June 15, 2019. Kemisie is located 326 km from Addis Ababa. The hospital provides specialized health services to the town and the surrounding population. There are different wards and clinics within Kemisie General Hospital, from which the ANC clinic is one of the services provided.

### Study Design

A facility-based cross-sectional study was employed to assess self-medication among pregnant women who were attending ANC at Kemisie General Hospital.

### Population

All pregnant women who attended ANC during the study period at Kemisie General Hospital were the source population, while all pregnant women who attended ANC at Kemisie General Hospital during the study period and who fulfilled the inclusion criteria were the study population. All pregnant women who were unable to hear or communicate with and with mental disabilities and mothers who refused to give information about the use of traditional medicine or modern medicine during pregnancy were excluded from the study.

### Sample Size Determination and Sampling Technique

The sample size was estimated by using a single population proportion formula using 26.6% prevalence,<sup>15</sup> 95% confidence level, and 5% tolerable sampling error. Since the source population was less than 10,000 (725), the sample size was adjusted with a total of 223 participants. A simple random sampling technique was employed to select the study participants.

### Study Variables

The dependent variables were the prevalence of self-medication practice of conventional and herbal medicine use and independent variables were socio-demographic characteristics of pregnant women, obstetrics characteristics, and previous history of self-medication of conventional and herbal medicine use.

## Data Collection Procedure and Quality Assurance

The data were pretested in five percent of the sample size at the Dessie referral hospital. After collecting the pilot data, the responses of the respondents were entered in a spreadsheet and the data were cleaned using principal component analysis. The reliability of the questionnaire was also checked using Cronbach's alpha test and a value of 77% was obtained. The data were collected using a structured interviewer-administered questionnaire by two nurses who had no working relation to the hospital after recruiting and training with the supervision of the principal investigators. Data were checked for completeness, accuracy, and consistency immediately after collection and appropriately arranged and kept in a secured place for compilation and analysis.

## Data Processing and Analysis

Data were entered and analyzed using the Statistical Package for Social Sciences version 20. After bivariate logistic regression analyses, variables with a p-value less than 0.25 was entered in the multivariate logistic regression and those with a p-value less than 0.05 were taken as statistically significant.

## Definition of Terms

**Self-medication:** It is taking drugs, herbs or home remedies on one's own initiative or on the advice of another person, without consulting a doctor.<sup>3</sup>

**Conventional medicines:** Is a medicine what you get from medical doctors, nurses, physical therapists, psychologists, and similar health-care professionals.

**Herbal medicine:** Is the use of medicinal plants for the prevention and treatment of diseases.<sup>19</sup>

## Results

Of 223 pregnant women, 71 (31.8%) were in the aged group of 25–29 years and 142 (63.7%) were married. Moreover, 86 (38.6%) pregnant women were at the college level, and 131 (58.7%) pregnant women were within 5 kilo meters (km) (Table 1).

Nearly half (52%) of pregnant women were in the second trimester. Two hundred fourteen (96%) pregnant women had less than five gravid and had less than three children. Twenty-nine (13%) of them had a history of previous abortion (Table 2).

**Table 1** Socio-Demographic Characteristics of Pregnant Women Attending ANC at Kemisie General Hospital, 2019 (N=223)

Characteristics	Frequency	Percent (%)
Age (year)		
15–19	58	26
20–24	24	10.8
25–29	71	31.8
30–34	37	16.6
35–39	24	10.8
40–49	9	4.0
Marital status		
Single	4	1.8
Married	142	63.7
Divorced	48	21.5
Widowed	29	13
Educational level		
Illiterate	44	19.7
Primary school	38	17.0
Secondary school	18	8.1
College/diploma	86	38.6
University/degree	37	16.6
Residence		
Urban	156	70
Rural	67	30
Distance from health facility		
<5km	131	58.7
5–10km	43	19.3
>10km	49	22
Average monthly income		
1000–1400	41	18.4
1500–1900	5	2.2
2000–2400	51	22.9
2500–2900	91	40.8
3000–3400	35	15.7

## Self-Medication Practice of Conventional Medicine

Sixty (26.9%; 95% CI: 20.9%, 32.9%) pregnant women practiced self-medication on conventional medicine during their current pregnancy. The most common reason for practicing self-medication was having prior experience with the drug 51 (46%), followed by poor knowledge about the disease, treatment and time saving 22 (19.8%) (Figure 1).

The stated reasons for self-medication were using drugs to treat headaches 18 (30%) followed by common cold (28%), while the most widely used drug for self-medication was paracetamol (31.7%). The most common

**Table 2** Obstetric Characteristics of Pregnant Women Attending ANC at Kemisie General Hospital, 2019 (N=223)

Variables		Frequency	Percent (%)
Gestational age	First trimester	59	26.5
	Second trimester	116	52.0
	Third trimester	48	21.5
Number of gravid	1–5	214	96.0
	>5	9	4.0
Number of child	1–3	214	96.0
	4–5	9	4.0
Previous abortion	Yes	29	13.0
	No	194	87.0

source of information for self-medication was pharmacist/druggist 26 (43%), and 30 (50%) got drugs from community drug retail outlets. Twelve (20%) pregnant women knew the dose of the drug, while 17 (28.3%) of them had no information about the drug they used for self-medication during pregnancy (Table 3).

Age, marital status, educational level, distance from health facility, average monthly income, obstetric characteristics and characteristics of conventional drugs had p-value less than 0.25, and were not fitted to multivariate logistics regression analysis. Multivariate logistic regression analysis showed that previous abortion and previous history of self-medication were significantly associated with current self-medication. Women with a previous history of self-medication were 126.04 folds to practice self-medication than those with no previous history of self-medication (AOR: 126.04, 95% CI (32.55–488.03)) and

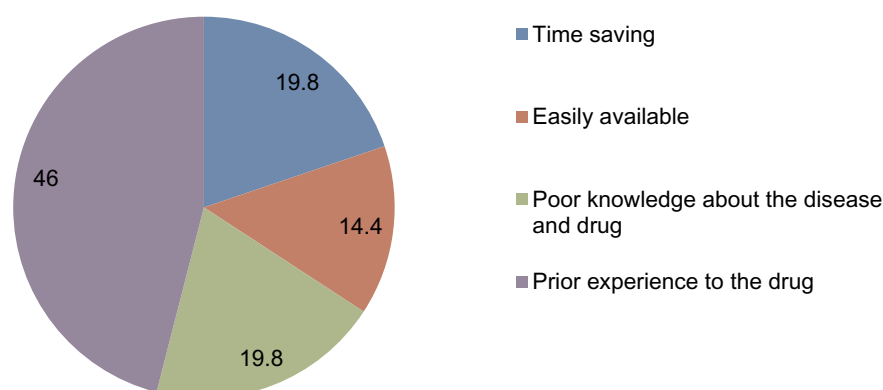
women's with previous history of abortion were 129.68 times to practice self-medication than those women's with no previous history of abortion (Table 4).

## Self-Medication Practice of Herbal Medicine

One hundred eleven (49.8%; 95% CI: 43%, 58%) of pregnant women practiced self-medication on herbal medicine during their current pregnancy. The stated reason for herbal medicine self-medication was easy accessibility 50 (45.1%) followed by lower cost 34 (30.6%) (Figure 2).

Seventy (63%) pregnant women used the herbs to treat the common cold and the most widely used herb was Damakesie (*Ocimum lamiifolium*) (49.5%) and Tenadam (*Ruta chalepensis*) (43%). Fifty-eight (52.3%) pregnant women got information from their family and friends and forty-three (38.7%) pregnant women attained herbal medicines through self-preparation (Table 5).

In the univariate logistic regression analysis, age, marital status, residence, distance from health facility, average monthly income, obstetric characteristics and characteristics of herbal medicines were not fitted to multiple logistics regression analysis (p-value <0.25). Multivariate logistic regression analysis revealed that pregnant women who were at college educational level were 13.45 times (AOR: 13.45, 95% CI (3.58–50.50)) to use herbal medicine as compared to pregnant women at the university level. Pregnant women with history prior herbal medicine use were 9 (AOR: 9, 95% CI (3.32–24.39)) times more likely to use herbal medicine as compared to pregnant women with no history to prior herbal medicine use. The odds of pregnant women who lived <5km and 5–10km were 62% (AOR: 0.38, 95% CI (0.07–1.99)) and 90%

**Figure 1** Conventional drugs self-medication reasons among pregnant women at Kemisie General Hospital, 2019 (N=60).

**Table 3** Characteristics of Conventional Drugs Self-Medication Among Pregnant Women at Kemisie General Hospital, 2019 (N=60)

Variables		Frequency	Percent (%)
Indication	Headache	18	30
	Nausea/Vomiting	9	15
	Urinary tract infection	4	7
	Common cold	17	28
	Cough	12	20
Common drugs used for self-medication	Paracetamol	19	31.7
	Aspirin	4	6.7
	Amoxicillin*	12	20
	Cough syrup	17	28.3
	Hyoscine	8	13.3
Sources of information	Yourself	14	23
	Husband	4	7
	Neighbor	8	13
	Internet	8	13
	Pharmacist/Druggist	26	43
Attainment of drugs used for self-medication	Neighbor	7	11.7
	Friend	4	6.7
	Shop	18	30
	Community drug retail outlets	30	50
	Other**	1	1.7
Knowledge about the drugs used for self-medication	Dose	12	20
	Side effect	13	21.7
	Administration	18	30
	No information	17	28.3

**Notes:** Amoxicillin\*, prescription medicine; Other\*\*, working area, family.

(AOR: 0.1, 95% CI (0.01–0.73)) less likely to had self-medication than pregnant women who lived greater than 10km (Table 6).

## Discussion

The prevalence of self-medication of conventional medicine was 60 (26.9%; 95% CI: 20.9%-32.9%). This was in line with the study done at the public hospital of Harar town (28.8%)<sup>2</sup> and Ondo state (35.2%),<sup>20</sup> but higher than studies done in Egypt (16.6%)<sup>21</sup> and Addis Ababa (18.2%)<sup>15</sup> and lower than Nigeria (62.9%)<sup>18</sup> and Yemen (54.1%).<sup>22</sup> A systematic review and meta-analysis also reported a high prevalence of self-medication.<sup>23,24</sup> This was due to poor awareness of pregnant women regarding medicines,<sup>17,25</sup> selling of prescription medications without prescription and loose regulatory system.<sup>26</sup>

The prevalence of herbal medicine use was 111 (49.8%; 95% CI: 43%-58%). This result was consistent with the study done at the University of Gondar referral and teaching hospital (48.6%).<sup>8</sup> The result was higher than that in Nigeria (38.6%),<sup>27</sup> Nigeria (6.6%),<sup>18</sup> Northern Uganda (20.4%),<sup>28</sup> Addis Ababa (10.9%),<sup>15</sup> Harar town (40.6%)<sup>2</sup> and Hossana (13.1%),<sup>29</sup> but lower than that done in Bangladesh (70%).<sup>30</sup> This was due to women's can easily access herbal medicines and self-prepare remedies at home.

The most common reasons for practicing self-medication of conventional medicine were having prior experience with the drug and time saving. This was comparable to the studies done in Egypt<sup>21</sup> and Harar town.<sup>2</sup> Easily accessibility and lower cost of herbal medicine were the common reasons for herbal medicine use. Similar results were reported by Addis Ababa,<sup>15</sup> Bangladesh,<sup>30</sup> Gonder,<sup>8</sup> and Hossana.<sup>29</sup>

In this study, 30% and 28% of pregnant women used drugs to treat headaches and common cold, respectively. The most widely used drug for self-medication was paracetamol (31.7%) and cough syrup (28.3%). This was comparable to the study done at Addis Ababa<sup>15</sup> and Harar town.<sup>2</sup> This was attributed to the availability of medications and perceiving the disease conditions as mild illness and assuming the disease did not require health-care visit. Damakesie (*Ocimum lamiifolium*) and Tenadam (*Ruta chalepensis*) were used as a self-medication among pregnant women in this study. Similar findings were also reported at Harar<sup>2</sup> and Hossana.<sup>29</sup> The availability of the stated herbs in every households were responsible for patterns of resort.<sup>4</sup>

In the present study, the most common source of information for self-medication of conventional medicine was pharmacist/druggist and themselves. Similar source of information was reported in Harar town.<sup>2</sup> Pharmacists are one of the most accessible health-care professionals in the community to offer ongoing education on medicines management, monitoring and advice to the population.<sup>31</sup> The most common source to obtain conventional medicine was community drug retail outlet. This was similar to the studies done at Bahirdar,<sup>32</sup> Hossana,<sup>29</sup> Uganda<sup>28</sup> and Harar town.<sup>2</sup> Private health facilities were often concerned on client attraction to promote and improve their market value, and continuity of care.<sup>33</sup>

Concerning the source of information for herbal medicine use, pregnant women families and friends were the common sources. It was similar to the study done at



**Table 4** Factors Associated with Conventional Drugs Self-Medication Among Pregnant Women at Kemisie General Hospital, 2019 (N=60)

Variables	Self-Medication		(COR,95% CI)	(AOR,95% CI)
	Yes(N)	No(N)		
Place of residence				
Urban	52(86.7)	104(63.8)	3.69(1.64–8.29)	1.4(0.26–7.41)
Rural	8(13.3)	59(36.2)	1.00	1.00
Number of gravid				
1–5	55(91.7)	159(97.5)	0.28(0.07–1.07)	0.27(0.02–3.32)
>5	5(8.3)	4(2.5)	1.00	1.00
Previous history of abortion*				
Yes	25(41.7)	4(2.5)	28.39(9.29–86.76)	129.68(28.70–585.86)
No	35(58.3)	159(97.5)	1.00	1.00
Prior self-medication*				
Yes	43(71.7)	8(4.9)	49.00(19.81–121.23)	126.04(32.55–488.04)
No	17(28.3)	155(95.1)	1.00	1.00

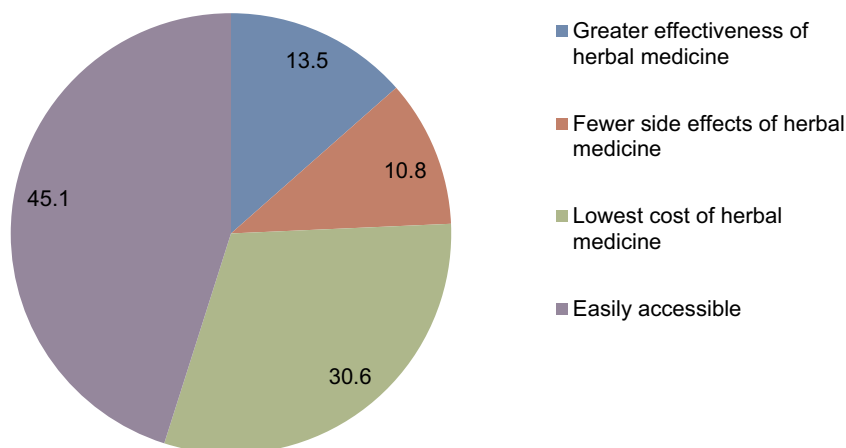
Note: \*P value <0.05.

Gonder,<sup>8</sup> Harar town<sup>2</sup> and Hossana town.<sup>29</sup> Pregnant women got herbal medicine commonly from neighbors and self-preparation. The result was similar with the studies done at Hossana,<sup>29</sup> Bahirdar,<sup>32</sup> and Addis Ababa,<sup>15</sup> but differs from the study done at Uganda.<sup>28</sup> This might be attributed to the high influence of peers and close relatives due to low cost, easily accessibility and prior experience of traditional medicines.<sup>4</sup>

The prior experience of self-medication on conventional medicine showed a significant association with self-medication practice of conventional medicine among pregnant women. Those pregnant women who had prior experience of self-medication were 126 times more likely (P-value: 0.00, AOR = 126.04, CI: 32.55–488.04) to practice self-medication

compared to those pregnant women with no prior experience. The finding was in line with studies done at Hossana,<sup>29</sup> Harar<sup>2</sup> and.<sup>34</sup> Prior herbal medicine use was also significantly (P-value: 0.00, AOR=9, 95% CI: 3.32–24.39) associated with the herbal medicine use among pregnant women and similar findings were reported in Bangladesh,<sup>30</sup> Bahirdar,<sup>32</sup> and Gonder<sup>8</sup> (9, 15). (11) This might be due to the fact that pregnant women attitude and practice to their earlier exposure to various conventional medicines might boost self-medication.

The previous history of abortion and self-medication are directly related. Pregnant women's with previous history of abortion were 129.69 times to practice self-medication than those women's with no previous history of

**Figure 2** Reasons for herbal medicine use among pregnant women at Kemisie General Hospital, 2019 (N=111).

**Table 5** Characteristics of Herbal Medicine Self-Medication Among Pregnant Women at Kemisie General Hospital, 2019 (N=111)

Variables		Frequency	Percent (%)
Type of herbs used	Ginger ( <i>Zingiber officinale</i> )	4	3.6
	Tenadam ( <i>Ruta chalepensis</i> )	48	43
	Damakesie ( <i>Ocimum lamiifolium</i> )	55	49.5
	Tosign (Ethiopian Thymus)	4	3.6
Indication of using herbal medicine	Headache	37	33
	UTI	4	3.6
	Common cold	70	63
Source of information about herbal medicine	Traditional healer	49	44
	Health profession	4	3.6
	Family & friends	58	52.3
Sources of the herbal medicine	Self-preparation	43	38.7
	Herbalist	16	14.4
	Traditional birth attendant	15	13.5
	Market place	4	3.6
	Neighbors	33	29.7

abortion (P-value: 0.00, AOR = 129.68, CI: 28.70–585.86). For termination of fetus and inducing abortion, pregnant women might practice self-medication of drugs, herbs or home remedies by their own initiative, or on the advice of another person, without consulting and visiting health facilities.<sup>2,29</sup>

The results of this study showed that the odds of those pregnant women whose distance from the health facility was 5–10km were 90% less likely to practice self-medication compared to those pregnant women who came from greater than 10km. Distance from the health facility was also a predictor for self-medication done in Bangladesh,<sup>30</sup>

**Table 6** Factors Associated with Herbal Medicine Self-Medication Among Pregnant Women at Kemisie General Hospital, 2019 (N=111)

Variables	Herbal Medicine Use		(COR,95% CI)	(AOR,95% CI)
	Yes N (%)	No N (%)		
Educational level				
Illiterate	36(32.4)	8(7.1)	23.25(7.27–74.34)	2.614(0.35–19.75)
Primary school	4(3.6)	34(30.4)	0.61(0.15–2.36)	0.06(0.0–1.65)
College*	61(55)	25(22.3)	12.61(4.68–33.94)	13.45(3.58–50.50)
University	6(5.4)	31(27.7)	1.00	1.00
Distance from health facility				
<5km*	63(56.8)	68(60.7)	0.11(0.39–0.28)	0.38(0.07–1.99)
5–10km*	4(3.6)	39(34.8)	0.01(0.00–0.04)	0.10(0.01–0.73)
>10km	44(39.6)	5(4.5)	1.00	1.00
Type of herbs used				
<i>Ruta chalepensis</i> *	48(43.2)	35(31.3)	4.8(1.45–15.83)	193.71(8.64–4342.13)
<i>Ocimum lamiifolium</i> *	55(49.6)	47(42)	4.1(1.26–13.29)	12.717(2.26–71.38)
Ethiopian Thymus	4(3.6)	14(12.5)	1.00	1.00
Prior herbal medicine use				
Yes*	91(82)	19(17)	22.27(11.16–44.46)	9.00(3.32–24.39)
No	20(18)	93(83)	1.00	1.00

Note: \*p<0.05.

Bahirdar,<sup>32</sup> and Gonder.<sup>8</sup> An increase in the residence of pregnant women from the health facility will cause demand for the herbal medicine to rise, and hence, pregnant women more likely to use herbs as self-medication to reduce direct and indirect medical cost of health services. Thus, affordability by patient determines the choice of therapy.<sup>35</sup>

Even though there was no statistically significant association between income level and knowledge of pregnant women to self-medication, a significant number of pregnant women practiced self-medication of herbal and conventional medicine. But in developed countries including Ethiopia, these variables were supposed to be the determinant for self-medication since lower level of knowledge and income of pregnant women increased the practice of self-medication.<sup>2,15</sup>

Understanding the prevalence of self-medication and associated factors will help health-care providers in educating and counseling pregnant women about the consequence of self-medication and herbal medicine use. The findings are also crucial to a ministry of health to design and implement strategies to control conventional and herbal medicines marketing, distribution, and use. This will enhance rational drug use and promote drug therapy. Furthermore, the cross-sectional type of study design did not allow for the causal-effect relationship to be inferred or concluded from the results of the study. Recall bias and social desirability bias among pregnant women might affect the study findings as they were requested to respond based on their life experience.

## Conclusion

Nearly one-third and two-third of pregnant women practiced self-medication on conventional and herbal medicine, respectively. The predictors of self-medication of conventional medicine among pregnant women were prior experience to the drug and no previous history of abortion, while college educational level, history prior herbal medicine use, *Ruta chalepensis* type of herb use, *Ocimum lamiifolium* type of herb use and 5–10km health facility distance were predictors for self-medication practice of herbal medicines among pregnant women. It is recommended that healthcare providers should address pregnant women about the effects and unsafe use of conventional and herbal medicines. Improving health service coverage and awareness creation on rational medication use was recommended to prevent fetal and maternal risks.

## Abbreviations

AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio; KM, kilometer.

## Data Sharing Statement

The datasets are available from the corresponding author upon reasonable request.

## Ethical Consideration

Before commencing data collection, ethical approval was obtained from Ethics Review Committee of the Department of Pharmacy, College of Medicine and Health Sciences, Wollo University (WU Phar/076/11). Then, the study was conducted in the selected facilities after granting permission from each facility administrator and Kemisie town health office. Verbal informed consent was approved by the Ethics Review Committee of the Department of Pharmacy, Wollo University and this study was conducted in accordance with the Declaration of Helsinki. Moreover, participant under the age of 18 years was approved by the Ethics Review Committee of the Department of Pharmacy, Wollo University to provide informed consent on their own behalf. Verbal informed consent was obtained from study participants after providing information regarding the purpose of the study, why and how they are selected to be involved in the study, and what will be expected of them. Confidentiality of patient-specific data was maintained throughout the study.

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## Authors' Contribution

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare that they have no potential competing interest.

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