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Self-medication practices of pregnant women attending antenatal clinic in northern Ghana: An analytical cross-sectional study

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Abstract

In Ghana, despite the dangers that self-medication poses to maternal and fetal health, there has been limited examination of self-medication among pregnant women. This study examines the practice of self-medication among pregnant women in Wa Municipality, Ghana. An analytical cross-sectional survey of 367 pregnant women was conducted in three health facilities. The prevalence of self-medication practice was 74.1%. The majority (68.4%) of pregnant women obtained unprescribed medicines from chemical shops; others utilized leftover drugs from previous hospital visits (15.8%) or herbal medications (9.9%), while others took unprescribed drugs from relatives or friends (5.9%). Analgesics (76.1%), antibiotics (24.6%), and antimalarials (16.2%) were the most frequently self-medicated drugs. The most common illnesses or symptoms for which pregnant women self-medicated were headaches (34.2%), back pain (33.1%), waist pain (32.7%), lower abdominal pain (20.6%), and malaria (16.2%). After adjusting for potential confounders, easy access to medication without prescription (AOR= 8.4), illness perceived as minor (AOR=4.1), availability of health facilities (AOR=4.2), and frequent lack of medicines at health facilities (AOR=1.7) were significantly associated with self-medication. Enforcing legislation to prevent the stocking and sale of certain analgesics and antibiotics, increasing service points, and improving service quality at antenatal clinics, outpatient departments and pharmacies could reduce self-medication. (*Afr J Reprod Health* 2021; 25[4]: 89-98).

Keywords: Self-medication, analgesics, antibiotics, pregnancy, antenatal clinic, Ghana

Résumé

Au Ghana, malgré les dangers que l'automédication fait peser sur la santé maternelle et fœtale, l'examen de l'automédication chez les femmes enceintes a été limité. Cette étude examine la pratique de l'automédication chez les femmes enceintes de la municipalité de Wa, au Ghana. Une enquête transversale analytique auprès de 367 femmes enceintes a été menée dans trois formations sanitaires. La prévalence de la pratique de l'automédication était de 74,1 %. La majorité (68,4 %) des femmes enceintes ont obtenu des médicaments sans ordonnance dans les magasins de produits chimiques ; d'autres utilisaient des restes de médicaments provenant de visites antérieures à l'hôpital (15,8 %) ou des médicaments à base de plantes (9,9 %), tandis que d'autres prenaient des médicaments non prescrits de parents ou d'amis (5,9 %). Les antalgiques (76,1 %), les antibiotiques (24,6 %) et les antipaludiques (16,2 %) étaient les médicaments les plus fréquemment auto-médiqués. Les maladies ou symptômes les plus courants pour lesquels les femmes enceintes s'automédiquaient étaient les maux de tête (34,2 %), les maux de dos (33,1 %), les douleurs à la taille (32,7 %), les douleurs abdominales basses (20,6 %) et le paludisme (16,2 %). Après ajustement pour les facteurs de confusion potentiels, accès facile aux médicaments sans ordonnance (AOR = 8,4), maladie perçue comme mineure (AOR = 4,1), disponibilité des établissements de santé (AOR = 4,2) et manque fréquent de médicaments dans les établissements de santé (AOR = 1,7) étaient significativement associés à l'automédication. L'application de la législation pour empêcher le stockage et la vente de certains analgésiques et antibiotiques, l'augmentation des points de service et l'amélioration de la qualité des services dans les cliniques prénatales, les services de consultation externe et les pharmacies pourraient réduire l'automédication. (*Afr J Reprod Health* 2021; 25[4]: 89-98).

Mots-clés: Automédication, antalgiques, antibiotiques, grossesse, clinique prénatale, Ghana

Introduction

Self-medication can be defined as the use of drugs to treat self-diagnosed disorders and symptoms, or

the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms¹⁻³. For minor illnesses, self-medication often provides an affordable, rapid and convenient

solution, without which the health care system of any country would be overcome with demand. However, irrational self-medication may result in misdiagnosis, antibiotic resistance, delays in seeking necessary medical advice and treatment, drug overdose, adverse drug reactions, and increased polypharmacy^{4,5}. Self-medication during pregnancy poses a double risk; in addition to potentially harmful effects for the mother, self-medication can have adverse consequences for the fetus^{6,7}.

The prevalence of self-medication in countries such as Cuba (7.3%)⁸, Greece (23.4%)⁹, and Portugal (26.2%)¹⁰ is generally lower than rates of self-medication in low- and middle-income country contexts (LMICs)^{1,2,11}. The most common types of medications used for self-medication among pregnant women in these contexts include analgesics, antibiotics, herbal remedies, antimalarials, antacids and antiemetics, vitamins and tonics, and hematinics¹²⁻¹⁸. Pregnant women's reasons for self-medicating are varied; some of the most common reasons for self-medication among pregnant women in LMICs include perceived illness as minor^{18,19} and the perception that the drugs available for self-medication, especially herbal medications, are safer^{14,19,20}, or more effective than conventional medicines^{14,20,21}. Health system challenges such as frequent lack of medicines at health facilities, or long waiting times for care, are also associated with self-medication in pregnancy^{14,15,18,19}.

Pregnant women in LMICs with less education are more likely to practice self-medication than those with tertiary education. A significant association is also reported between self-medication and the occupation of pregnant women^{12,14} and is expected to be mediated by low levels of income and education¹².

In LMICs pregnant women obtain medicines for self-medication from a variety of sources including the market, over-the-counter chemical shops, itinerant drug hawkers, and pharmacies^{14,22,23}. Gaps in the regulatory enforcement of policies that govern dispensing practices in these contexts, such as the requirement for a physician prescription for the sale of some medicines and for over-the-counter (OTC) shops to

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stock and sell only Class C drugs, which exclude most antibiotics and strong analgesics^{24,25}, contribute to the burden of self-medication practice and its associated risks^{14,15,18,26}.

In Ghana, despite the wide availability of over-the-counter medicine shops and dispensaries and the dangers that self-medication poses to maternal and fetal health, there has been limited examination of self-medication among pregnant women. This study examines self-medication practice among pregnant women in Northern Ghana.

Methods

Study area

The study was carried out in the Wa Municipality, the capital of the Upper West Region (UWR), located in the north of Ghana. Using projections based on the 2010 Population and Housing Census, the Municipality has a total population of 107,214 out of which there are 25,732 women in fertility age (WIFA) and an annual 4,289 expected pregnancies in 2014²⁷. The study focused on pregnant women attending Antenatal Care (ANC) in Upper West Regional Hospital, Urban Health Centre, and Kambali Health Centre. These facilities were purposively sampled because together, they cater to a large population of Wa Municipality.

Study design

A quantitative analytical cross-sectional study design was used. Surveys were conducted over four (4) weeks between 15th May to 15th June 2017. Respondents were interviewed for an average of 15 minutes each.

Sampling method

Simple random sampling was used to select pregnant women attending ANC at three facilities. Using an estimated proportion of 68.3% of self-medicated pregnant women from a previous study²², a sample size of 334 was calculated using the Cochran(1963) formula²⁸ and allowing a margin of 10% for refusals and non-respondents, a total sample size of 367 was reached.

Selection of study participants

Pregnant women above 18 years attending ANC at the selected health facilities within the data collection period were eligible for selection. Every fifth pregnant woman in the queue was approached for possible inclusion in the study until the sample size was reached.

Data collection

A structured questionnaire consisting of 33 closed-ended questions and one open-ended question was used. Questions focused on the practice of self-medication, common drugs used, and conditions for which the respondents resorted to self-medication during the current pregnancy and within 4 weeks preceding the survey, in addition to pre-selected factors women perceived to influence their self-medication. Pre-testing was completed with 25 pregnant women selected from a different facility not included in the study. The questionnaire was administered in Wale, Dagari, English, or Twi according to respondents' preference.

Data analysis

Data were analysed using STATA v14. Descriptive statistics were performed for demographic characteristics. Bivariate analyses were performed to assess the crude association between potential predictor variables and self-medication and presented as crude odds ratios (COR). Significant demographic or perceived factors were further analysed using logistic regression methods to determine an adjusted odds ratio (AOR). Statistical significance was set at $p < 0.05$ for all analyses.

Results

Demographic characteristics

Respondents were between 18 and 45 years (mean age of 28.6 ± 4.9); the majority 307 (83.6%) were married. Most 167 (45.5%) had no formal education while approximately one-quarter 98 (26.7%) had secondary education and above. Most women were self-employed 167 (45.5%) or unemployed 133 (36.2%); a minority were government employees 45 (12.3%) or students 22 (6.0%). Over

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Table 4: Drugs commonly used for self-medication among pregnant women

Drug Classes	Frequency of times reported N=272	Percentage (%)
Acetaminophen (Paracetamol)	79	76.1
NSAIDS (Ibuprofen, Diclofenac)	34	12.5
Tramadol	88	32.4
Antibiotics (e.g. amoxicilin, septrin, flagyl, etc.)	60	22.1
Dewormers	7	2.6
Antimalarial	44	16.2
Herbal medicine (e.g., Achyranthes aspera, sphaeralcea coccinea, etc.)	28	10.3
Anti-dyspeptics (e.g., antacids, omeprazole, etc.)	27	9.9
Cough syrup	21	7.7
Anti-emetics (e.g., promethazine, etc.)	18	6.6
Vitamins (vitaprine, ultimate omega, B-G glutamine plus and ultra-vitamin B complex)	7	2.6
Diazepam (valium, diastat and diastat AcuDial)	3	1.1

two-thirds of respondents 295 (81%) had a valid National Health Insurance Scheme (NHIS) card to access free-at-the-point-of-care health services from accredited facilities.

Self-medication was practiced by 74% (n=272) of respondents. The majority 186 (68.4%) had purchased drugs from private over-the-counter (OTC) chemical shops; others utilized leftover drugs from previous hospital visits 43 (15.8%) or herbal medications 27 (9.9%), or took drugs from relatives or friends 16 (5.9%).

Drugs commonly used for self-medication among pregnant women

Most respondents reported self-medicating with more than one drug. Analgesics (paracetamol, tramadol, ibuprofen and diclofenac), antibiotics and antimalarials were the most commonly reported drugs. Drugs such as diazepam and vitamins were the drugs least reported (Table 1).

Conditions commonly treated using self-medication among pregnant women

The most common conditions for which respondents resorted to self-medication included

Table 5: Bivariate analysis of demographic factors

Variable	Number of respondents (N=367)	Self-Medication Yes (272)	Self-Medication No (95)	Chi-square (χ^2) value	p-value
Age group				0.947	0.623
18 - 24	72(19.6)	52(72.2)	20(27.7)		
25 - 34	253(68.9)	191(75.5)	62 (24.5)		
35 – 45	42(11.5)	29(69.0)	13 (31.0)		
Marital status^a				2.871	0.233
Single	30 (8.2)	26(86.7)	4 (13.3)		
Married	307(83.6)	223(72.6)	84 (27.4)		
Cohabiting	30(8.2)	23(76.7)	7 (23.3)		
Place of residence^a				6.190	0.045
Own apartment	190(51.8)	133(48.9)	57 (30.0)		
Rented	146(39.8)	111(40.8)	35 (24.0)		
Living with parents	31(8.4)	28(10.3)	3 (9.7)		
Educational status				8.345	0.039
No formal education	167(45.5)	120(71.9)	47 (28.1)		
Primary	55(15.0)	47(85.5)	8 (14.5)		
JHS	47(12.8)	39(83.0)	8 (17.0)		
Secondary+	98(26.7)	66(67.3)	32 (33.7)		
Occupational status^a				9.679	0.021
Students	22(6.0)	18(81.8)	4 (18.2)		
Self-employed/ private Business	167(45.5)	126(75.4)	41 (24.6)		
Government	45(12.3)	25(55.6)	20 (44.4)		
Unemployed	133(36.2)	103(77.4)	30 (22.6)		
Number of children				2.435	0.487
None	111(30.2)	86(77.5)	25 (22.5)		
1	107(29.2)	78(72.9)	29 (27.1)		
2	95(25.9)	72(75.8)	23 (24.2)		
3+	54(14.7)	36(66.7)	18 (33.3)		
NHIS status				6.705	0.010
Insured	295(80.9)	210(71.2)	85 (28.8)		
Not insured	72(19.1)	62(86.1)	10 (13.9)		
Stage of pregnancy				2.062	0.356
First trimester	79(21.5)	55(69.6)	24 (30.4)		
Second trimester	135(36.8)	98(72.6)	37 (27.4)		
Third trimester	151(41.7)	119(78.8)	34 (22.2)		

* $p < 0.05$, ** $p < 0.01$, *** < 0.001 Notes: ref=reference

^a= Fisher exact test used for bivariate analysis because of small cell size

headache (34.2%), [upper] back pain (33.1%), waist pain [low back pain without sciatica] (32.7%), lower abdominal pain (20.6%) and malaria (16.2%).

Demographic factors influencing self-medication

Self-medication was significantly associated with occupation, educational status, place of residence, and possession of a valid NHIS card when bivariate logistic regression was performed (Table 2). Pregnant women who were self-employed/private business owners 126(75.4%), students 18(81.8%)

and unemployed 103(77.3%) were more likely to self-medicate than pregnant women who were government employed 25 (55.6%) ($P = 0.010$; OR = 2.46; 95% CI, 1.239–4.869, $P = 0.042$; OR = 3.59; CI 1.049–12.349, $P = 0.006$, OR = 2.75, 95% CI 1.343– 5.614) respectively. Pregnant women with primary education 55(15%) and Junior high school education (JHS) 47(12.8%) were more likely to practice self-medication than pregnant women with Senior High School education and Tertiary education 98(26.7%) ($P < 0.09$, OR = 3.12 95% CI 1.324–7.356, $P < 0.03$, OR = 2.58, 95% CI 1.088–6.163). Also, pregnant women living with their parents 28(10.3) were more likely to self-medicate

Table 6: Bivariate analysis of factors influencing the practice of self-medication

Variables	Respondents N=367 (%)	Self-medication		χ^2	p-value
		Yes (%)	No (%)		
Perceived illness as minor				33.530	<0.001
Yes	223(60.8)	189(84.8)	34(15.2)		
No	144(39.2)	83(57.6)	61(42.4)		
Prior experience with self-medication				35.572	<0.001
Yes	145(39.5)	83 (57.2)	62(42.8)		
No	222(60.5)	189(85.1)	33(14.9)		
Availability of health facilities				44.838	<0.001
Yes	208(56.7)	182(87.5)	26(12.5)		
No	159(43.3)	90(56.6)	69(43.4)		
Far distance to health facilities.				3.535	0.060
Yes	185(50.4)	145(78.4)	40(21.6)		
No	182(49.6)	127(69.8)	55(30.2)		
Availability of enough skilled health personnel				4.591	0.032
Yes	258(70.3)	183(70.9)	75(29.1)		
No	109(29.7)	89(81.7)	20(18.3)		
Waiting time at health facility				6.420	0.040
Normal	88(24.0)	60(68.2)	28(31.8)		
Short	95(25.9)	65(68.4)	30(31.6)		
Long	184(50.1)	147(79.9)	37(20.1)		
Number of times told there is no medicine at the health facility				14.653	0.001
Never	50(13.6)	36(72.0)	14(28.0)		
Sometimes	173(47.1)	114(65.9)	59(34.1)		
Always	144(39.2)	122(84.7)	22(15.3)		
Difficulty getting transportation to the health facility				5.497	0.019
Yes	129(53.1)	105(81.4)	24(18.6)		
No	238(64.9)	167(70.2)	71(29.8)		
Cost of transportation to the health facility				9.292	0.002
Expensive	124(33.8)	104(83.9)	20(16.1)		
Not expensive	243(66.2)	168(69.1)	75(30.9)		
Availability of chemical shops and pharmacies				4.018	0.045
Yes	332(90.5)	251(75.6)	81(24.4)		
No	35(9.5)	21(60.0)	14(40.0)		
Closeness of chemical shops				0.283	0.963
Very close	87(23.7)	66(75.9)	21(24.1)		
Close	177(48.2)	131(74.0)	46(25.9)		
Far	68(18.5)	50(73.5)	18(26.5)		
Very far	35(9.5)	25(71.4)	10(28.6)		
Easy access to medications without prescription				72.967	<0.001
Yes	243(66.2)	214(88.1)	29(11.9)		
No	124(33.8)	58(46.8)	66(53.2)		
Cost of medicine bought from the chemical shop				4.079	0.043
Expensive(yes)					
Not expensive (No)	144(39.2)	115(79.9)	29(20.1)		
	223(60.8)	157(70.4)	66(29.6)		
Presence of cultural norms and beliefs that promote self-medication				13.963	<0.001
Yes	114(31.1)	99(86.6)	15(13.4)		
No	253(68.9)	173(68.4)	80(31.6)		
Potency of traditional medicine over orthodox medicine				16.613	<0.001
Yes	64(17.5)	58(90.6)	6(9.4)		
No	275(74.9)	189(68.7)	86(31.3)		
Depends on the condition	28(7.6)	25(89.3)	3(10.7)		

*p<0.05, **p<0.01, ***<0.001. Notes: ref=reference

Table 7: Multivariate analysis of factors significantly associated with self-medication

Variable	COR (95% CI)	p-value	AOR (95% CI)	p-value
Place of Residence				0.643
Own apartment	Ref			
Rented	1.4(0.832-2.219)	0.220	1.1(0.673-1.896)	
Living with parents	4 (1.168-13.691)	0.027		
Educational Status				0.787
Secondary+	Ref			
No formal education	1.4(0.841-2.468)	0.184	0.9(0.757-1.234)	
Primary	3.1(1.324-7.356)	0.009		
JHS	2.6(1.088-6.163)	0.031		
Occupational status				0.620
Government workers	Ref			
Self-employed/private	2.5(1.239-4.879)	0.010	0.9(0.763-1.174)	
Students	3.6(1.049-12.349)	0.006		
Unemployed	2.7(1.344-5.614)			
NHIS status				0.560
Insured	Ref			
Not insured	2.5(1.229-5.124)	0.012	1.3(0.509-3.473)	
Perceived illness as minor				<0.001
Yes	4.1(2.496-6.685)	<0.001	4.1(2.166-7.689)	
No	Ref			
Availability of health facilities				<0.001
Yes	5.4(3.200-8.999)	<0.001	4.2(2.234-8.022)	
No	Ref			
Waiting time at health facility				0.974
Normal	Ref			
Short	1.0 (0.5421-1.885)	0.972	0.9(0.759-1.304)	
Long	1.8(1.042-3.296)	0.035		
Availability of enough skilled health personnel				0.989
Yes	Ref			
No	1.8(1.047-3.175)	0.034	0.9(0.456-2.167)	
Number of times told there is no medicine at the health facility				0.021
Never	Ref			
Sometimes	0.8(0.376-1.502)	0.419		
Always	2.2(1.002-4.640)	0.049	2.0 (1.088-2.841)	
Cost of transportation to health facility				0.274
Expensive				
Not expensive	2.3(1.339-4.026)	0.003	1.7(0.662-4.270)	
Availability of chemical shops and pharmacies	Ref			0.287
Yes	2.1(1.004-4.249)	0.049	1.6(0.664-3.981)	
No	Ref			
Difficulty getting transportation to the health facility				0.643
Yes				
No	1.9(1.102-3.139)	0.020	1.2(0.499-3.078)	
Easy access to medication without prescription	Ref			<0.001
Yes	8.4(4.971-14.185)	<0.001	8.2(4.299-15.742)	
No	Ref			
Cost of medicine bought from the chemical shop				0.181
Expensive(yes)	1.7(1.013-2.744)	0.045	1.6(0.811-3.034)	
Not expensive (No)	Ref			

Potency of traditional medicine over orthodox medicine				0.215
Yes	4.4(1.828-10.587)	0.001	1.4 (0.758-3.433)	
No	Ref			
Presence of cultural norms and beliefs that motivates respondents to self-medicate				0.169
Yes	3.1(1.668-5.585)	<0.001	1.9(0.754-5.015)	
No	Ref			
Depends on the condition				

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Notes: ref=reference

than pregnant women with their own apartment 133(48.9%) ($P < 0.02$, OR = 4.0 95% CI 1.168–13.691). Pregnant women who had no valid NHIS card 62(86.1%) were more likely to practice self-medication than pregnant women who were in possession of a valid NHIS card 210(71.2%) ($P < 0.012$, OR = 2.5 95% CI 1.1229–5.124).

Perceived factors influencing or promoting self-medication

The largest association with self-medication was found for *easy access to medications without prescription* ($\chi^2=72.967$; p -value < 0.001). Other factors such as *availability of health facilities* ($\chi^2=44.838$; p -value < 0.001), *illness being perceived as minor* ($\chi^2=33.530$; p -value < 0.001), and *prior experience with self-medication* ($\chi^2=35.572$; p -value < 0.001), amongst others, were also significant (see Table 3).

Multivariate analysis

Pregnant women who had easy access to medication without prescription 214(88.1%) were associated with eight-fold odds of self-medication compared to pregnant women without easy access to medication without prescription 58(46.8%) (AOR= 8.4; C.I.: 4.971-14.178, p -value < 0.001). Other factors which recorded significant odds included illness perceived as minor (AOR 4.1; CI 2.166-7.689, p -value < 0.001), availability of health facilities (AOR=4.2; CI:2.234-8.022, p -value < 0.001), and frequent lack of medicines in health facilities (AOR 2.0; CI 1.088-2.841, p -value 0.021) (see Table 4). Pregnant women who perceived illness as minor 189 (84.8%) were more likely to self-medicate than pregnant women who perceived illness to be serious 83(57.6%). Pregnant women who always experienced a lack of medicines in

health facilities 122 (84.7%) were more likely to engage in self-medication compared to pregnant women who sometimes experienced a lack of medicines in facilities 114 (65.9%). Pregnant women who have access to health care facilities in terms of the availability of facilities 182(87.5%), were more likely to practice self-medication than pregnant women who have no access to health care facilities 90(56.6%).

Discussion

Self-medication practice among pregnant women was high (74%). High incidences of self-medication amongst pregnant women have also been reported in countries such as Nigeria (85%)²⁹. However, different countries and locales within sub-Saharan Africa report significant differences in the prevalence of self-medication, this may be due to differences in relevant local regulations, access to healthcare, as well as person-factors such as education and socio-economic level^{2,12,15}. For example, the lower prevalence reported by Marwa in Mwanza, Tanzania¹², may be a result of the advanced educational status of pregnant women, whereas this study points to the significance of non-demographic factors, such as easy access to medications without a prescription, illness perceived as minor and health system factors such as lack of medications at hospital dispensaries and availability of health facilities.

Analgesics were the most frequently self-medicated drug in this study, followed by antibiotics and antimalarials. This trend is similar to findings from studies carried out around Africa in other LMIC contexts, such as Nigeria^{17,29-31}. Drug classes commonly used in self-medication, either by pregnant women or the general population, appear to be similar in other geographical areas. A meta-analysis of self-medication studies in Ethiopia

found a similar trend of self-medicated drugs across different population groups including health professionals and students¹³. Whilst most of the drugs used fall under relatively safer pregnancy drug categories³², some of them such as Tramadol, Ibuprofen, and other NSAIDs belong to category C and above, with increased risk for teratogenicity in pregnancy³².

The reported drugs used for self-medication correspond to the pattern of self-reported ailments. Pain-related conditions such as headaches (34.2%) back pain (33.1%), waist pain (32.7%), and lower abdominal pain (20.6) were the most commonly self-reported conditions, followed by malaria (16.2%). Similar trends in ailments for which pregnant women apply self-medication have been reported in other studies. Whereas pain-related conditions typically top the self-reported ailments list, other reported ailments tend to reflect local patterns of disease, with malaria and infective ailments featuring prominently in African studies^{12,29,31}.

In the current study, herbal medication uses still ranked higher than medications used for abdominal discomfort and emesis, which are rather common ailments in pregnancy. In this study, cultural and social beliefs around the potency of herbal treatments over orthodox medicines were found to be significantly associated with self-medication. Aside from locally prevailing cultural reasons for the use of herbal medicines, other studies found some association between lower socio-economic status and herbal medication use in pregnancy¹⁷.

Predictably, the perception that ailments were minor maintained a significant association with self-medication upon regression analysis. These findings are similar to those documented in other countries like DR Congo, India, Nigeria, and Ethiopia^{18,19,26}. When people feel familiar with their disease condition, and feel that the disease condition is not severe enough to deserve the attention of medical personnel, they are more likely to resort to self-medication. This is worsened when the person has had a prior poor experience with health services and where there is easy access to medicines without physician prescription³³. Easy access to medication without physician prescription

was the strongest predictor of self-medication and increased the odds of self-medication among pregnant women 8.4 times. Most women had obtained drugs from OTC shops. Similar observations have been reported in studies from other LMICs, such as Ethiopia, Iran, and Nigeria^{15,17,30,34}. The availability of and easy access to over-the-counter drugs in Ghana and other similar settings may be ascribed to the failure of regulatory bodies (such as Ghana's Pharmacy Council) to enforce existing drug regulations²⁴.

Other health systems factors including availability of health facilities also maintained a significant association with self-medication after regression analysis. The availability of health facilities increased the odds of self-medication fourfold. While it is unlikely that the existence of health facilities promotes self-medication in itself, other findings of this study such as frequent lack of medicines at the health facility, long waiting times, and previous experience with treatments for common ailments may explain the association between health facilities and self-medication. The odds of self-medication were almost double among pregnant women who visited facilities that lacked essential medicines compared to pregnant women who visited facilities with essential medicines in stock. Other studies have found that there is a positive association between the practice of self-medication and health system factors such as long waiting times at the hospital, lack of medications at the hospital, and cost of uninsured treatments^{14,35}.

Easy access to healthcare through affordable national health insurance packages, such as Ghana's NHIS may be expected to protect against self-medication through improving access to health facilities. However, in this current study, other health system factors such as lack of drugs at healthcare facilities may have had an adverse effect on the expected association between NHIS enrollment and self-medication. In Ghana, the frequent lack of medicines at health facilities may largely be attributed to the late reimbursement of health facilities by the NHIS^{36,37}. The under-resourcing of the scheme has reportedly led to frequent stock-outs of essential drugs resulting in the referral of women to other facilities or private pharmacies³⁸.

Limitations

The data, which is self-reported, is subject to recall bias. Respondents may also provide information based on perceptions of desirable behavior. However, respondents were only asked to recount experiences in the current pregnancy in order to reduce the chances of an inaccurate recall. Interviews were also held away from service areas by interviewers who were not staff of the health facilities.

Ethical approval

Approval was granted by the Ghana Health Service Ethical Review Committee (GHS-ERC: 15/12/2016) and the Upper West Regional Director of Health Service. Written informed consent was obtained from respondents.

Conclusion

Self-medication is high among pregnant women in northern Ghana and can be accounted for by easy access to medications without a prescription, perception of illness as minor, and other health system factors such as long waiting times at health facilities and lack of medications at hospital dispensaries. Enforcing legislation that limits the stocking and OTC sale of certain analgesics and antibiotics by the Pharmacy Council of Ghana and the Health Facilities Regulatory Agency (HEFRA) and improving service quality by ensuring faster, but safe, friendly, and efficient service delivery in our health care facilities, in collaboration with district and municipal assemblies, could all contribute to reducing self-medication.

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Authors' Contributions

AS conceived and designed the study, participated in proposal development, data collection, data analysis, manuscript writing, and submission. PBA participated in proposal development, data collection, data analysis, and manuscript writing. LW, JA, and SK participated in data analysis and manuscript writing. All authors have read and approved the final version of the manuscript.

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