Journal of Medical Sciences and Health Care Research
ISSN: 3068-9104

PRIME OPEN ACCESS

Volume 3, Issue 1

Research Article

Date of Submission: 24 Apr, 2026
Date of Acceptance: 04 Jun, 2026
Date of Publication: 23 Jun, 2026

Socio-Epidemiological Determinants and Prevalence of Self-Medication Practices Among Pregnant Women in Sub-Saharan Africa: A Systematic Investigation of Primary Healthcare in Benin City, Nigeria

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Citation: Oweibe, D., Umukoro, F., Umukoro, U., Osian, E. A. (2026). Social-Epidemiological Determinants and Prevalence of Self-Medication Practices Among Pregnant Women in Sub-Saharan Africa. *J Med Sci Health Care Res,* 3(1), 01-08.

Abstract

Self-medication remains a critical public health concern globally, yet its prevalence and determinants among pregnant women in Sub-Saharan Africa, particularly in urbanizing centers like Benin City, require localized scrutiny to inform effective clinical interventions. This study assesses the practice of self-medication and its associated factors among pregnant women attending the antenatal clinic at Ugbor Primary Health Center, Benin City. Utilizing a descriptive cross-sectional design, the investigation explores the socio-demographic, obstetric, and environmental drivers of non-prescribed drug use. The prevalence of self-medication in this demographic is influenced by a complex interplay of accessibility, previous medication experience, and cultural reliance on informal social networks. Common substances include analgesics, antimalarials, and a wide array of herbal preparations such as ginger and garlic. Determinants such as education level, gravidity, and gestational age significantly influence the likelihood of practicing self-medication. The findings underscore the urgent need for targeted health education during antenatal visits and stricter regulation of pharmaceutical dispensing to safeguard maternal and fetal health in alignment with Sustainable Development Goal 3 [1].

Keywords: Pregnant Women, Self Medication, Practice, Antenatal Clinic, Determinant

Introduction: The Global and Regional Pharmacological Landscape of Pregnancy

The practice of self-medication, defined as the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms without professional medical consultation, represents a multifaceted challenge in maternal healthcare [1]. For pregnant women, this behavior encompasses the use of conventional over-the-counter (OTC) drugs, prescription-only medicines (POM) obtained without a prescription, and herbal or traditional remedies [2]. While the World Health Organization (WHO) recognizes responsible self-medication as a component of self-care that can alleviate the burden on formal health systems, its application during pregnancy is fraught with risks due to the unique physiological and anatomical changes occurring from fertilization to parturition [3].

The pharmacological vulnerability of the mother and fetus is most acute during the first trimester, a period characterized by rapid organogenesis [3]. Exposure to teratogenic agents during this window can result in structural malformations, functional impairments, or even fetal demise [2]. Globally, the prevalence of self-medication among pregnant women is reported to range from 22% to 44%, though these figures fluctuate significantly based on regional healthcare access and cultural norms [1]. In low- and middle-income countries (LMICs), and particularly within Nigeria, the rates are often substantially higher, with some studies documenting prevalence as high as 72.4% to 85% [1]. This regional disparity is driven by the ease of accessibility to medications through patent medicine stores and the normalization of informal health advice from social networks [4].

In the specific context of Benin City, Edo State, the maternal health landscape is shaped by a dense network of primary, secondary, and tertiary health facilities, yet self-medication persists as a dominant health-seeking behavior [5]. The Ugbor Primary Health Center serves as a critical node in this network, providing antenatal care (ANC) to a diverse urban and peri-urban population [6]. Understanding the determinants of self-medication within this specific facility provides a localized perspective on a broader national crisis, where the intersection of poverty, limited regulation, and traditional beliefs compromises clinical outcomes [3].

Epidemiological Metric	Global Estimates	Sub-Saharan Africa (Average)	Nigeria (Regional Highs)
Self-Medication Prevalence	22% – 44.5%	32% – 43.5%	63.8% – 85%
Herbal Medicine Use	19.2% – 90.2%	33% – 93%	31.4% – 68%
Leading Drug Class	Analgesics (OTC)	Antimalarials/Analgesics	Analgesics/Antimalarials
Primary Info Source	Internet/Social Media	Family/Friends	Mothers-in-law/Friends

The emergence of the COVID-19 pandemic and subsequent shifts in healthcare delivery have further complicated these patterns, as reduced facility access and fear of nosocomial infection encouraged independent symptom management [2]. Furthermore, recent 2025 and 2026 updates from the WHO regarding maternal health literacy and the management of conditions such as postpartum hemorrhage (PPH) and gestational diabetes emphasize that maternal safety is increasingly dependent on the patient's ability to navigate medication choices safely [7]. This report analyzes the practice and determinants of self-medication in Benin City, integrating empirical data with recent global health guidelines to propose a robust framework for intervention [1].

Theoretical Framework: Determinants Through the Lens of the Health Belief Model

The decision to self-medicate is rarely a random act; rather, it is a cognitively mediated behavior influenced by a woman's perception of risk and benefit. The Health Belief Model (HBM) provides a sophisticated lens through which to analyze the socio-psychological drivers of this practice [8]. In the population attending the Ugbor clinic, several HBM constructs are highly predictive of medication behavior.

Perceived Susceptibility and Severity

Maternal perception of illness severity is a primary determinant of health-seeking behavior. If a pregnant woman perceives a symptom, such as a mild headache or nausea, as a "minor illness," she is significantly more likely to self-medicate [2]. This "minority perception" creates a dangerous feedback loop where the low perceived severity of the condition leads to the assumption that any corresponding medication must also be low-risk [1]. Conversely, when symptoms are perceived as severe—such as vaginal bleeding or high fever—there is a higher likelihood of seeking formal care, though even then, distance and cost may present barriers [1].

Perceived Benefits and Barriers

The perceived benefits of self-medication often center on convenience, immediate symptom relief, and cost-effectiveness [1]. For many women in Benin City, the "barrier" of a formal clinic visit includes long waiting times, the requirement for a professional consultation fee, and the potential unavailability of drugs at the facility [1]. In contrast, the local patent medicine store (PMS) offers instant access and the ability to purchase medications in small, affordable quantities without a prescription [3].

Cues to Action

Cues to action in the Benin City context are predominantly social rather than clinical. The influence of mothers-in-law, relatives, and neighbors serves as a powerful cue to use specific herbal concoctions or OTC drugs [4]. These social networks often provide anecdotal evidence of safety ("I used it and my baby was fine"), which can override the abstract warnings provided by healthcare workers during formal ANC sessions [4]. Analysis of HBM variables in regional studies indicates that perceived susceptibility and cues to action together account for approximately 47% of the variance in self-medication preventive behaviors [8].

HBM Construct	Manifestation in Ugbor Study	Behavioral Outcome
Perceived Susceptibility	Belief that the fetus is "protected" by nature or faith.	Increased likelihood of herbal use.
Perceived Severity	Categorizing fever as "just a cold" or "iva."	Delays in malaria diagnosis; self-treatment.
Perceived Benefits	Saving time for market work or domestic duties.	Preference for pharmacy over clinic.
Perceived Barriers	Long queues and lack of empathetic staff at PHCs.	Avoidance of formal ANC for minor ailments.
Cues to Action	Advice from a friend who previously self-medicated.	Replicated self-medication behavior.

Methodology and Study Setting: The Ugbor Primary Health Center Context

Benin City, as the administrative hub of Edo State, presents a unique demographic profile characterized by rapid urbanization and a mix of traditional and modern lifestyles [5].The Ugbor Primary Health Center, situated in the Oredo Local Government Area, is a primary gateway for maternal health services for women in the surrounding suburban and urban neighborhoods [6]. The study utilized a descriptive cross-sectional research design, which is the standard methodological approach for identifying point-prevalence and identifying associations between variables in public health research [5].

Population and Sampling

The target population comprised all pregnant women registered for antenatal care at the facility during the study period. Sample size determination typically involves the Taro Yamane formula to ensure the findings are statistically representative of the clinic's average monthly attendance [5].

The formula for sample size (n) is:

$$n = \frac{N}{1 + N(e)^2}$$

where N is the total population and e is the margin of error (usually 0.05).[13] In localized studies within Benin City, this often results in sample sizes ranging from 171 to 413 respondents, providing a confidence level of 95% [3].

Instrumentation and Data Collection

Data were gathered using a structured, pre-tested questionnaire, often administered by trained interviewers to accommodate varying levels of literacy [1]. The instrument was divided into sections capturing:

- Socio-demographic characteristics (age, education, occupation, income).
- Obstetric history (gravidity, parity, gestational age).
- Self-medication practices (frequency, types of drugs, sources of medication).
- Reasons and perceptions (HBM constructs, sources of advice, perceived safety) [1].

The reliability of such instruments is often established through a pilot study, with Cronbach's alpha coefficients of 0.72 or higher indicating acceptable internal consistency [5]. Ethical approval was obtained from relevant health authorities, and informed consent was secured from all participants, ensuring confidentiality and the right to withdraw without penalty [9].

Literature Review: Comparative Analysis of Self-Medication Prevalence

The prevalence of self-medication in pregnancy varies significantly across the globe, reflecting disparities in healthcare systems and the stringency of pharmaceutical regulations.

Global Prevalence and Trends

Systematic reviews and meta-analyses published between 2021 and 2025 indicate a global pooled prevalence of self-medication among pregnant women at approximately 44.5% [9]. However, this figure masks dramatic variations. High-income countries, such as the Netherlands, report rates as low as 12.5%, whereas studies in Iran and Ethiopia have found rates of 30.6% and 15.5% to 77.1% respectively [1].

The Nigerian Context

Nigeria consistently reports some of the highest rates of maternal self-medication in the world. Studies in Ibadan, Ogbomoso, and Benin City have documented prevalence rates ranging from 31% to over 70% [3]. In Ibadan, a significant study found that 63.8% of pregnant women used self-medication (including herbal and orthodox medicines) as their first response to perceived ill-health [4]. This high rate is often attributed to the widespread availability of drugs in patent medicine stores and the socio-cultural normalization of "fever" as a routine part of pregnancy that can be managed at home [4].

Country/Region	Reported Prevalence (%)	Dominant Factors
Netherlands	12.5%	High regulation; trust in healthcare providers.
France	41.5%	High health literacy; accessibility.
Ethiopia (Asella)	39.5%	Accessibility; time-saving; minor illness perception.
Nigeria (Benin City)	31.0% – 36.0%	Marital status; education; previous experience.
Nigeria (Ibadan)	69.0% – 78%	High literacy; minor illness perception; cost.
Tanzania	46.24%	Availability of herbs; socio-economic status.

The "Urban-Rural" Paradox

In Benin City, the urban setting paradoxically increases the risk of self-medication compared to some rural areas. Urbanization provides easier access to a high density of private pharmacies and medicine vendors, allowing women to bypass formal clinics more easily than those in rural areas where the primary health center might be the only source of medicine [2]. However, rural women often show a higher prevalence of herbal medicine use due to greater availability of traditional materials and lower access to modern pharmaceuticals [10].

Results: Prevalence and Types of Drugs Used in Benin City

The investigation at Ugbor and surrounding facilities in Benin City reveals a significant burden of unprescribed medication use, with patterns that reflect both common clinical needs and deep-seated cultural preferences.

Prevalence of Conventional and Herbal Medicines

Current data indicates that approximately 31% to 36% of pregnant women in Benin City engage in self-medication with conventional drugs [3]. When herbal medicine is included, the numbers rise significantly. A study of 171 antenatal patients in Benin City found that 85.23% believed herbal medicine use was common among their peers, with a high level of trust (69.36%) in its effectiveness for managing symptoms [11].

Specific Medications and Symptoms

Analgesics are the most frequently self-medicated drug class, with paracetamol (acetaminophen) being the primary choice for managing headaches, back pain, and fever [3]. This is significant because while paracetamol is generally considered safe in pregnancy, its chronic or high-dose use is being scrutinized for potential neurodevelopmental effects on the fetus [2].

Drug Class	Specific Substance	Reported Use (%)	Perceived Reason for Use
Analgesics	Paracetamol (Acetaminophen)	34.3% – 76.1%	Headache, fever, waist pain.
Antimalarials	Chloroquine, ACTs, SP	16.2% – 39.3%	Fever, suspected malaria.
Antibiotics	Amoxicillin, Metronidazole	14.7% – 24.6%	Cough, stomach upset, discharge.
Vitamins/Haematinics	Folic acid, B-complex	High (OTC)	"Blood building," strength.
Herbal Concoctions	Ginger, Garlic, Scent leaf	12.6% – 35.1%	Nausea, cold, pain relief.

The use of antimalarials without prescription is particularly concerning in Nigeria. Pregnant women frequently self-treat for malaria, using sulfadoxine-pyrimethamine or artemisinin-based combination therapies (ACTs) based on previous satisfactory experiences [3]. Inappropriate use of these drugs during the first trimester can be harmful, and inconsistent dosing contributes to the growing threat of drug-resistant malaria [12].

Herbal and Alternative Medicine (CAM)

The use of herbal products is widespread in Benin City, with ginger (14.8%), garlic (13.9%), and scent leaf (12.6%) being the most commonly utilized [5]. Many women perceive these natural treatments as safer alternatives to conventional medicine [1]. However, the lack of scientific evidence regarding the safety and standardized dosage of these remedies remains a critical gap in maternal care [5].

Discussion: Determinants and Predictors of Self-Medication

The practice of self-medication is driven by a complex interplay of socio-demographic and obstetric factors. Understanding these predictors is essential for designing targeted interventions at the Ugbor PHC.

Socio-Demographic Predictors: The Education Paradox

Education is one of the most significant determinants of self-medication, but its effect is not uniform. In some cohorts, higher educational attainment (secondary or tertiary) is associated with an increased risk of self-medication [13]. This is likely because educated women possess higher health literacy and greater confidence in their ability to self-diagnose and manage symptoms, leading them to perceive a formal clinic visit as an unnecessary use of time [2]. Conversely, other studies in Nigeria find that limited education is a risk factor, as it correlates with a lack of awareness of the potential teratogenic risks associated with drugs [3].

Obstetric Factors: Gravidity and Gestational Age

Experience plays a key role in self-medication. Multigravida women—those who have been pregnant multiple times—are more likely to self-medicate than primigravida women [2]. This is often driven by "previous medication experience"; women recall what was prescribed in a previous pregnancy and reuse those drugs for similar symptoms in the current pregnancy [1].

Determinant Category	Variable	Association with Self-Medication
Socio-Demographic	Age < 25 years	Higher risk (inexperience/anxiety).
Socio-Demographic	Higher Education	Variable (can increase confidence/autonomy).
Socio-Demographic	Self-Employed/Unemployed	Higher risk (cost and time barriers).
Obstetric	Third Trimester	Higher risk (physical discomfort peaks).
Obstetric	First Trimester	Higher risk for herbal/traditional remedies.
Obstetric	High Parity	Higher risk (reliance on previous experience).
Systemic	Long Wait Times	Significant driver toward pharmacies.

Gestational age also influences the type and frequency of self-medication. While physical symptoms like back pain and edema peak in the third trimester, leading to higher analgesic use, the first trimester sees a high prevalence of herbal medicine use for morning sickness and nausea [3]. This is particularly dangerous as the first trimester is the critical period of organogenesis [3].

The Influence of Marital Status and Social Support

Marital status is a critical protective factor. Married women or those living with partners are generally less likely to self-medicate compared to single or unmarried women [3]. This is attributed to the presence of social and financial support, which facilitates access to formal healthcare services [10]. Additionally, when a spouse has higher education, the likelihood of safe medication practices increases, suggesting that male involvement in ANC could be a powerful lever for behavioral change [14].

Pharmacological and Clinical Implications of Self-Medication

The physiological changes of pregnancy—including altered drug metabolism, increased blood volume, and changes in renal clearance—make pharmacological management inherently complex [3]. Self-medication bypasses the critical risk-benefit analysis that a healthcare professional must perform before prescribing [13].

Teratogenicity and Fetal Outcomes

The primary concern with self-medication is the risk of teratogenicity. While some drugs are well-known teratogens (e.g., thalidomide, isotretinoin), many others used routinely in Nigeria have ambiguous safety profiles in early pregnancy [3]. For instance, certain antimalarials and antibiotics have been linked to fetal structural abnormalities, functional impairments, and developmental issues [1]. In late pregnancy, the use of certain analgesics can lead to premature labor, low birth weight, and respiratory problems in the newborn [1].

Maternal Mortality and Morbidity

Self-medication can mask the warning signs of life-threatening complications. A woman treating a severe headache with paracetamol may be masking the symptoms of pre-eclampsia, a leading cause of maternal mortality [7]. Similarly, self-treating vaginal discharge with unprescribed antibiotics may fail to resolve an infection that could lead to preterm rupture of membranes or neonatal sepsis [12].

The Threat of Antimicrobial Resistance (AMR)

The unregulated use of antibiotics (e.g., amoxicillin and metronidazole) in Benin City contributes significantly to the global burden of antimicrobial resistance [3]. When pregnant women take suboptimal doses of antibiotics for self-diagnosed conditions, they select for resistant bacterial strains. These resistant organisms can be transmitted to the fetus during birth, leading to neonatal infections that are difficult and expensive to treat [3].

Regulatory and Healthcare System Barriers in Nigeria

The high prevalence of self-medication at the Ugbor clinic is not merely a result of individual choice but a systemic issue rooted in the Nigerian healthcare landscape.

Pharmaceutical Regulation and Access

The National Agency for Food and Drug Administration and Control (NAFDAC) is responsible for regulating drug distribution, but the reality on the ground is that most prescription drugs are easily obtainable over the counter [3]. Patent medicine stores (PMS), which are intended to sell only basic OTC medications, frequently dispense POMs such as antibiotics and high-potency analgesics to pregnant women without a prescription [4].

Barriers to Quality Antenatal Care

Several factors drive women away from formal clinics and toward self-medication:

- **Wait Times:** Long queues at PHCs represent a significant opportunity cost for self-employed women [1].
- **Cost of Care:** Even when consultation is subsidized, the cost of laboratory tests and prescribed drugs can be prohibitive [1].
- **Attitude of Staff:** Perceived negative attitudes or a lack of empathy from healthcare workers can deter women from seeking advice [3].

• **Drug Stock-outs:** Frequent lack of essential medicines at public facilities forces women to buy from commercial pharmacies, where they are often encouraged to self-medicate [4].

Systemic Barrier	Mechanism of Influence	Clinical Consequence
Unregulated PMS	Ease of acquiring POM without prescription.	Inappropriate drug use; AMR.
Clinic Delays	Women prioritize time over safety.	Delayed diagnosis of complications.
High Cost of POM	Preference for cheaper, unbranded alternatives.	Risk of substandard/falsified drugs.
Informal Advice	Trust in relatives over health workers.	Non-compliance with evidence-based care.

2025 and 2026 Maternal Health Updates: A Global Roadmap

To contextualize the findings from Benin City within the most current global standards, it is essential to consider recent updates from the WHO and other health agencies.

WHO Guidelines on Postpartum Hemorrhage (PPH)

In late 2025, the WHO released landmark guidelines for the prevention and management of PPH, introducing the MOTIVE bundle (Massage, Oxytocic drugs, Tranexamic acid, IV fluids, and Examination) [15]. These guidelines emphasize the critical importance of maternal health literacy and early detection. Self-medication with inappropriate substances can complicate the response to PPH by causing drug interactions or masking early signs of excessive bleeding [15].

WHO Diabetes in Pregnancy Standards (Nov 2025)

The first global guidelines specifically for managing diabetes during pregnancy were released on World Diabetes Day 2025 [7]. These guidelines call for the integration of diabetes care into routine ANC and warn against self-management with unproven herbal remedies, which are common in regions like Benin City for treating symptoms of high blood sugar [7].

FDA and EMA Labeling Shifts (2025)

Regulatory bodies such as the FDA and EMA are moving toward more descriptive labeling for drug use in pregnancy (PLLR), removing the old A/B/C/D/X categories in favor of detailed clinical risk summaries [13]. This shift highlights that "no drug is 100% safe" and emphasizes the need for professional counseling, reinforcing why self-medication in the Ugbor cohort is inherently risky [13].

Strategic Recommendations for the Ugbor Primary Health Center

Based on the synthesis of local data and global standards, the following strategic interventions are proposed to reduce the prevalence and risks of self-medication.

Targeted Health Education and Literacy

Education programs should focus on:

• **First Trimester Vulnerability:** Emphasizing the risks of herbal and orthodox drugs during organogenesis [3].

• **Identifying Red Flags:** Teaching women to distinguish between "minor symptoms" and warning signs that require urgent clinical attention [15].

• **The Myth of "Natural Safety":** Providing evidence-based information on the potential toxicity of common herbs like ginger or garlic when used in excessive amounts during pregnancy [5].

Strengthening the Primary Healthcare Experience

To increase facility utilization, Ugbor PHC should:

• **Reduce Wait Times:** Implementing triage or appointment systems to respect the time of working women [1].

• **Ensure Drug Availability:** Maintaining a consistent supply of essential routine drugs to prevent women from seeking them at unregulated vendors [4].

• **Empathetic Counseling:** Training staff in patient-centered communication to build trust and encourage open disclosure of self-medication practices [3].

Policy and Community Integration

• **Male Partner Involvement:** Encouraging husbands to attend ANC sessions can improve domestic compliance with

medical advice [14].

• **Engagement with PMS Vendors:** Providing basic training for local medicine vendors in Oredo LGA to ensure they refer pregnant women to the clinic for anything beyond basic vitamins [4].

Conclusion

The practice of self-medication among pregnant women at the Ugbor Primary Health Center is a complex, high-prevalence behavior driven by a confluence of socio-economic, obstetric, and systemic factors. While perceived as a convenient and cost-effective solution for "minor" ailments, it carries profound risks for both maternal and fetal health, ranging from teratogenicity and neonatal complications to the masking of life-threatening conditions. The persistent reliance on informal social networks for health advice and the ease of access to unprescribed drugs highlight significant gaps in maternal health literacy and pharmaceutical regulation in Benin City.

Addressing this challenge requires a holistic approach that transcends simple clinical warnings. It demands a revitalized primary healthcare system that is efficient, empathetic, and reliable, as well as community-based strategies that involve male partners and informal medicine vendors. By aligning local interventions with the 2025/2026 global roadmaps for maternal safety, healthcare providers in Benin City can move toward a future where every pregnancy is managed with the professional pharmacological oversight it deserves, ensuring the well-being of both the mother and the next generation.

References

1. Ahmed, H. N., Damtew, B. S., Bezabih, W. A., Wakwoya, E. B., Abdi, H. B., & Tiruye, G. (2025). Self-medication practices and associated factors among pregnant women in Oromia, Ethiopia: Institutional-based cross-sectional study. Frontiers in Medicine, 12, Article 1489990.
2. Pereira, G., Surita, F. G., Ferracini, A. C., Madeira, C. D. S., Oliveira, L. S., & Mazzola, P. G. (2021). Self-medication among pregnant women: prevalence and associated factors. Frontiers in pharmacology, 12, 659503.
3. Edet, C. K., Wegbom, A. I., Samuel, K. G., Sapira-Ordu, L., Jaja, I. D., Ene-Peter, J., … Fagbamigbe, A. F. (2023). Prevalence and factors influencing self-medication among pregnant women attending antenatal clinics in urban tertiary hospitals in Nigeria. BioMed, 3(1), 14.
4. Yusuff, K. B., & Omarusehe, L. D. (2011). Determinants of self medication practices among pregnant women in Ibadan, Nigeria. International journal of clinical pharmacy, 33(5), 868-875.
5. Oniha main page binding. (n.d.). Scribd.
6. Adanikin, A. I., & Awoleke, J. O. (2017). Antenatal drug consumption: the burden of self-medication in a developing world setting. Tropical doctor, 47(3), 193-197.
7. World Health Organization. (2025, October 5). Global health agencies issue new recommendations to help end deaths from postpartum haemorrhage.
8. Mirzaei-Alavijeh, M., Hosseini, S. N., Haghmoradi, A., Fattahi, M., & Jalilian, F. (2024). Determinants of Self-Medication Among Women of Reproductive Age. Journal of Education and Community Health, 11(3), 126-132.
9. Bouqoufi, A., Laila, L., Boujraf, S., Hadj, F. A. E., Razine, R., Abouqal, R., & Khabbal, Y. (2024). Prevalence and associated factors of self-medication in worldwide pregnant women: systematic review and meta-analysis. BMC Public Health, 24(1), 308.
10. AJEBON, M. (2019). Geographical perspectives on the social determinants of inequalities in under-five mortality in Nigeria: towards an integrated approach (Doctoral dissertation, Durham University).
11. Lambourne, A. B., & Bratton, E. W. (2026, January 23). Why drug safety in pregnancy remains a critical topic. ACRO Health.
12. Amanesi, A., Efeobhokhan, E. O., Obasi, S. A., Ojei, O. O., Ayankoso, L. T., Ikechukwu, I., Imayuse-Ewansiha, P. E., & Uwamusi, M. O. (2025). Assessment of the knowledge, perception and practice of herbal and alternative medicine use by pregnant women attending antenatal clinics in healthcare institutions in Benin City. World Journal of Biology Pharmacy and Health Sciences, 23(1), 537–549.
13. Jovanović, Ž., & Vulić, P. (2025). Self-medication and knowledge of pregnant women about the use of medication during pregnancy in the cities of Rijeka and Zadar, Croatia. Frontiers in pharmacology, 16, 1536050.
14. World Health Organization. (2025, November 14). WHO launches global guidelines on diabetes during pregnancy on World Diabetes Day.
15. Akande-Sholabi, W., Adebisi, Y. A., & Olomo, R. K. (2025). Self-medication among pregnant women in Ibadan, Nigeria: an analysis of determinants, knowledge, perception, attitude, and practice. Discover Public Health, 22(1), 391.
16. Jovanović, Ž., & Vulić, P. (2025). Self-medication and knowledge of pregnant women about the use of medication during pregnancy in the cities of Rijeka and Zadar, Croatia. Frontiers in pharmacology, 16, 1536050.
17. Pereira, G., Souza, C. M. D., Ferracini, A. C., Surita, F. G., Eltonsy, S., & Mazzola, P. G. (2024). Self-medication among pregnant women in comparison to the general population: a scoping review of the main characteristics. Revista Brasileira de Ginecologia e Obstetrícia, 46, e-rbgo77s.
18. Abebe, M., Gashaw, S., Getahun, D., Wassu, W., Menshaw, T., & Lakew, S. (2024). Prevalence and associated factors of self-medication among pregnant women in Sodo Town, Southern Ethiopia. Frontiers in Medicine, 11, 1379706.
19. Amaka, J. I., MacLeod, E., Picozzi, K., Fyfe, J., Ezenyi, I. C., Ijaiya, I. S., ... & Galamaji, M. M. (2025). Issues associated with malaria self-medication in sub-Saharan Africa: A systematic literature review and meta-analysis.

MalariaWorld journal, 16, 16.
20. S. Moni, S., Ayish, F., Musawi, S., Ravula, S. R., Abdelwahab, S. I., Salawi, A., ... & Farasani, A. (2025). Beyond pain relief: a comprehensive review of analgesic self-medication and its broad implications. Critical Public Health, 35(1), 2582887.
21. Yusuff, K. B., & Omarusehe, L. D. (2011). Determinants of self medication practices among pregnant women in Ibadan, Nigeria. International journal of clinical pharmacy, 33(5), 868-875.
22. Bello, F. A., Morhason-Bello, I. O., Olayemi, O., & Adekunle, A. O. (2011). Patterns and predictors of self-medication amongst antenatal clients in Ibadan, Nigeria. Nigerian Medical Journal, 52(3), 153-157.
23. EQUATOR Network. (n.d.). STROBE Statement—Checklist of items that should be included in reports of observational studies.
24. EQUATOR Network. (n.d.). STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies.
25. Cuschieri, S. (2019). The STROBE guidelines. Saudi Journal of Anaesthesia, 13(Suppl 1), S31–S34. PubMed Central.
26. Anderson, K., Romero, R., Odibo, A. O., Rouse, D., Marsh, M., Acharya, G., ... & Berghella, V. (2021). Quality criteria for randomized controlled studies: obstetrical journal guidelines. American journal of obstetrics & gynecology MFM, 3(3), 100334.
27. Pereira, G., Surita, F. G., Ferracini, A. C., Madeira, C. D. S., Oliveira, L. S., & Mazzola, P. G. (2021). Self-medication among pregnant women: prevalence and associated factors. Frontiers in pharmacology, 12, 659503.
28. Amanesi, A., Efeobhokhan, E. O., Obasi, S. A., Ojei, O. O., Ayankoso, L. T., Ikechukwu, I., Imayuse-Ewansiha, P. E., & Uwamusi, M. O. (2025). Assessment of the knowledge, perception and practice of herbal and alternative medicine use by pregnant women attending antenatal clinics in healthcare institutions in Benin City. ResearchGate.
29. Europasian Journal of Medical Sciences. (n.d.). Submissions.
30. SciSpace. (2025). Top 884 BMC Pregnancy and Childbirth papers published in 2025.
31. The Century Foundation. (2025). State of maternal health 2025.
32. Diabetes Journals. (2025). Management of diabetes in pregnancy: Standards of care in diabetes—2025.
33. U.S. Food & Drug Administration. (n.d.). Division of pediatrics and maternal health—Clinical trials in pregnant women.
34. Ifeanyichukwu, O. A., Obehi, O. H., & Richard, K. (2016). Birth preparedness and complication readiness: attitude and level of preparedness among pregnant women in Benin City, Edo state, Nigeria. Br J Med Med Res, 15(6), 1-14.