UTILISATION OF PATENT MEDICINE STORES/VENDORS FOR HEALTH SERVICES BY RESIDENTS OF OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE

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MAY, 2026

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BEING A ONE YEAR PROJECT PRESENTED TO THE DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

IN PARTIAL FUFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE BACHELOR OF MEDICINE, BACHELOR OF SURGERY (MBBS) DEGREE IN THE UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA.

MAY, 2026

DECLARATION

We hereby declare that this research project titled **"UTILISATION OF PATENT MEDICINE STORES/VENDORS FOR HEALTH SERVICES BY RESIDENTS OF OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE"** was conducted under supervision and has not been submitted in part or in full for any purpose or publication or award of degree.

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CERTIFICATION

This is to certify that this research study titled **"UTILISATION OF PATENT MEDICINE STORES/VENDORS FOR HEALTH SERVICES BY RESIDENTS OF OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE"** was conducted by **ATAMEWAN SARAH ESEOSA** with matriculation number **MED1807373** and **AWO-OSAGIE AISOSA ANDREW** with matriculation number **MED1807376** under the supervision of Prof. V. Y Adam in the Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) degree.

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DEDICATION

We dedicate this project to Almighty God, whose grace sustained and helped us complete this work. We also dedicate it to our families for their consistent spiritual, financial and moral support. Finally, we dedicate this work to Prof. V.Y. Adam, our teacher, for guiding us throughout this project.

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LIST OF ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
CP	Community Pharmacist
FGD	Focus Group Discussion
IDI	In-Depth Interview
ILO	International Labour Organization
IMCI	Integrated Management of Childhood Illnesses
ISCO	International Classification of Occupations
KII	Key Informant Interview
LCSs	Licensed Chemical Sellers
LMIC	Low- and Middle-Income Countries
ORS	Oral Rehydration Solution
OTC	Over-The-Counter
OTCMS	Over-The-Counter Medicine Seller
PMV	Patent Medicine Vendor
PPMVs	Patent Medicine and Proprietary Vendors
RDT	Rapid Diagnostic Test
SevenCEWA	Seven Communities East and West Africa

SEM Structural Equation Modelling

OPERATIONAL DEFINITION OF TERMS

Focus Group Discussion: a qualitative research method where a small group of individuals, typically 6-10 people, engage in a guided discussion about a specific topic. These discussions are facilitated by a moderator who guides the conversation and probes for in-depth information.

In-Depth Interview: a qualitative research method that involves conducting one-on-one interviews with a small number of participants to gather rich, detailed information about their perspectives, experiences, and feelings on a particular topic.

Key-Informant Interview: a qualitative research method that involves in-depth conversations with individuals who possess specialized knowledge, expertise, or unique perspectives on a particular topic or community.

Over-The-Counter Medicine: a medicine that can be bought without a prescription (doctor's order).

Patent Medicine Vendor: individual without formal training in pharmacy who sells orthodox pharmaceutical products on a retail basis for profit.

ABSTRACT

BACKGROUND: Patent medicine stores and vendors frequently serve as the first point of care for many individuals across Nigeria, particularly in semi-urban and rural areas. Although measures exist to regulate their practices, their widespread utilisation for primary health services remains a major public health consideration.

OBJECTIVES: This study assessed the utilisation of patent medicine stores and vendors (PMVs) for health services among residents of Ovia North East Local Government Area, Edo State.

METHODOLOGY: A descriptive cross-sectional study was conducted among 550 residents of Ovia North East Local Government Area, Edo State. Respondents were selected using a multi-sampling method. Data were collected using a structured, interviewer-administered questionnaire and analysed using IBM SPSS version 27.0. The level of significance was set at $p < 0.05$.

RESULT: The mean age of respondents was 29.0±13.5 years, with 304 (55.3%) females and 392 (71.3%) single. Regarding types of health services utilised, malaria treatment was the most frequently sought service 507 (92.2%), followed by headache or pain relief 463 (84.2%) and fever management 441 (80.2%). In contrast, services such as family planning 111 (20.2%), reproductive health advice 111 (20.2%), and treatment of sexually transmitted infections 63 (11.5%) were markedly underutilised. Perceived benefits of PMV patronage included shorter waiting times 407 (74.0%), closer proximity 394 (71.6%), and extended operating hours 339 (61.6%), while major perceived risks were delay in proper medical care 277 (50.4%), sale of medicines without prescription 257 (46.7%), and insufficient vendor training 249 (45.3%). Factors significantly associated with utilisation were proximity to home 385 (70.0%), extended operating hours 341 (62.0%), previous positive experience 338

(61.5%), and cost of services 324 (58.9%). Overall, 364 (66.2%) respondents were satisfied with PMV services, with male residents demonstrating significantly higher satisfaction 180 (73.2%) and willingness to recommend 194 (78.9%) than females with 184 (60.5%) and 193 (63.5%,) respectively.

CONCLUSION: Majority of the respondents utilised patent medicine stores for health services, with malaria treatment being the most sought-after care. Accessibility and convenience were the primary drivers of this health-seeking behavior, despite a clear awareness of clinical risks. Satisfaction remained high, especially among male residents. Formal integration, targeted training, and strengthened regulatory oversight are urgently needed to improve the safety and quality of care provided by PMVs.

Keywords: Utilisation, Patent Medicine Stores, Vendors, Health Services, Ovia North East, Satisfaction, Perceived risks, Determinant

CHAPTER ONE
INTRODUCTION

1.1. BACKGROUND

“Patent Medicine Vendors (PMVs) are individuals without formal training in pharmacy who sell orthodox pharmaceutical products on a retail basis for profit".[1] They are essential in the healthcare system, particularly in rural and underserved communities, often serving as the first point of contact for individuals seeking medical care.[2] They operate in patent medicine stores which must be situated in a specific address, clearly display the license of the PMV, and are subject to periodic inspection by appointed pharmaceutical inspectors.[3]

PMVs stock, market and sell Over-The-Counter(OTC) medicines but are prohibited from selling prescription medications and conducting invasive procedures.[2] The medicines are sold in pre-packaged form from the manufacturers, and these packages must be unaltered for the sale of drugs in lesser or greater numbers.[4] In many low-income countries, including Nigeria, they play an essential role in health care delivery, providing health care services to a significant proportion of the population.[1] PMVs are known to perform other services, including consultation for minor ailments such as malaria, weight and blood pressure measurements, wound dressing, first aid services, and administration of intramuscular drugs.[2] However, PMVs often practice beyond their legal scope, including unauthorized dispensing of prescription medication, selling counterfeit drugs, and rendering abortion and post-abortion care services.[2]

A 2018 study carried out in Kwara State, Nigeria showed that PMVs are a major source of medications for individuals, particularly those in rural and underserved communities.[2] Residents widely patronize PMVs for the host of health services they provide.[1] PMVs are often the first point of contact for individuals suffering from common illnesses such as

malaria, diarrhea, respiratory infections, and body pain.[1] Residents typically purchase over-the-counter medicines such as some analgesics, antimalarials, antihistamines, antacids, antitussives, and Oral Rehydration Solution (ORS) from PMVs to treat these illnesses.[2]

Residents of communities often rather patronize PMVs for health services due to their longer opening hours, hospitality, and more consistent availability.[1] Despite the benefits of convenience and accessibility, there are significant risks associated with patronizing PMVs, particularly regarding incorrect drug dispensing, misdiagnosis, and the promotion of substandard or counterfeit medications.[2] The indiscriminate sale of antibiotics without prescriptions contributes to antimicrobial resistance, a growing public health threat. [5]

Accessibility is a major factor that influences the utilisation of PMV services, as their widespread presence and extended operating hours make them a convenient option for many residents.[1] Several other factors, including influence from household members and friends, perceived severity of illness, relying on previous experiences, quality of care available, PMV reputation, and the need to use multiple treatments, may facilitate the utilisation of PMVs for health services.[2]

Residents of communities are largely satisfied with health services provided by PMVs, as incentives which include the caring attitude of PMVs, accessibility, availability, shorter waiting time and flexible pricing significantly influence the level of satisfaction of residents and even increase the level of patronage.[6] Despite concerns about misdiagnoses and inappropriate medication use, studies show that residents are largely satisfied with the setting, process and outcome of care provided.[7]

1.2. STATEMENT OF PROBLEM

Patent and Proprietary Medicine Vendors (PPMVs) play a central role of primary healthcare access in Nigeria, particularly in underserved communities where formal medical infrastructure is scarce. Multiple empirical studies have documented the extent to which Nigerians rely on PPMVs for a wide range of health needs. For example, a national survey conducted in Nigeria in Ebonyi and Kaduna states, in June 2015 found that between 35% and 55% of adults sought care for ailments such as headache, fever, cough, cold, or diarrhea through PPMVs[2,8], while 8% to 55% did so for common childhood illnesses such as malaria, pneumonia, and diarrhea, in Lagos and Kebbi States [8,9]. Notably, respiratory complaints such as cough and cold were less likely to have been diagnosed by a formally trained provider prior to presentation at these outlets.[2]

In addition to treating common ailments, PPMVs in Nigeria often provide sexual and reproductive health services, including sexual health education, contraceptive counseling, and the sale of contraceptive products. A study conducted in Jigawa in March 2022 reported that emergency contraceptives and sexual performance-enhancing drugs such as Postinor, Combination 4, Iwofem, Postpil, and Embarga, were widely available for purchase at PPMV outlets, despite such sales being prohibited by regulatory authorities [10]. This availability underscores both the accessibility of PPMVs and the ongoing regulatory challenges in curbing unauthorized pharmaceutical distribution.

PPMVs also sell medicines with or without prescriptions and provide basic health-related services such as weight measurement and blood pressure monitoring. While many stock items on the approved drug list, some outlets carry medicines outside the sanctioned inventory. A study done in Jigawa State in January 2015 confirmed that their

collaboration with pharmacists is typically restricted to drug purchasing rather than broader clinical oversight.[6]

Although global data on the service provision of PPMVs remain sparse, research within Nigeria and other African contexts has shown that community residents actively utilise these outlets because their services are tailored to the specific health needs of the population. A 2018 study, in Kwara, revealed that community members view PPMVs as integral to local healthcare provision due to their proximity and responsiveness[2.] The degree of utilisation of PPMVs is shaped by factors such as perceived benefits, affordability, and accessibility, as well as the limited availability of formal healthcare. A 2023 study among rural and remote Nigerian communities found that while 62.5% of residents perceived the quality of healthcare provided by PPMVs as poor, they nonetheless relied on these outlets due to accessibility and cost advantage[11]. In many low- and middle-income countries (LMICs), including Nigeria. In a study conducted in 2023, in four Nigerian communities (Okpok Ikpa, Ikire, Ogane-Uge, and Olorunda Abaa) and one community each in Kenya (Viwandani), Uganda (Soroti), and Tanzania (Ukonga)., over 70% of the population depends on PPMVs for primary healthcare[12].

However, their operations are not without risk. Globally, an estimated 25% of medicines sold in LMICs are substandard or counterfeit [11] In Africa, 45% of PPMVs have been found to dispense incorrect antimalarial dosages[7], thereby increasing the risk of treatment failure and drug resistance. In Sokoto, a 2018 study documented that 59.9% of PPMVs regularly sold antibiotics without prescriptions, fueling the rise of antimicrobial resistance [13].

The proliferation of unlicensed medicine outlets exacerbates these risks. In 2024, a national report identified over 2 million unlicensed pharmacies and PPMVs operating in

Nigeria, underscoring their dominance in healthcare provision [14]. Patterns of utilisation also vary by demographic characteristics. A 2019 study in Lagos State, Nigeria, found that market women with lower educational attainment were more likely to self-medicate and rely on PPMVs rather than seek formal care [15]. Similarly, a 2023 study in Lagos and Kebbi States in Nigeria, revealed that men were more likely to visit PPMVs than community pharmacists[16].

Across Africa, PPMVs remain a primary source of medicines, particularly in rural settings. A 2022 study conducted in rural Uganda found that over 60% of households used informal drug sellers due to affordability and perceived treatment efficacy [2]. Nonetheless, inadequate regulation and the absence of formal medical training among many PPMVs have led to inappropriate dispensing practices, contributing to antibiotic resistance, adverse drug reactions, and avoidable treatment failures.

These persistent patterns of utilisation, despite well-documented public health risks, emphasize the urgent need for enhanced regulatory enforcement, improved health education, and targeted training programs for PPMVs. Without such interventions, continued reliance on these vendors will likely exacerbate existing healthcare challenges, particularly in low-resource settings where formal medical services remain inaccessible to a significant portion of the population.

1.3. JUSTIFICATION OF STUDY

The widespread reliance on PMVs as healthcare providers in Nigeria presents both opportunities and challenges for the country's health system. Although they increase access to basic health services, their lack of formal training and regulatory oversight raises concerns about patient safety and treatment effectiveness.[1] By examining the types of health services

provided by PMVs in Ovia North East, this study will contribute valuable data to health policymakers, regulatory agencies, and public health professionals. Understanding the range of services offered will help determine whether PMVs should be better integrated into the formal healthcare system or if stronger enforcement measures should be implemented to regulate their activities.

Investigating which health services are most commonly utilised by residents will provide insights into healthcare-seeking behaviours in the region. If a majority of residents rely on PMVs for treatment of serious conditions, it may indicate a deficiency in formal healthcare accessibility.[2] Identifying gaps in healthcare service delivery will enable targeted interventions, such as strengthening primary healthcare centres or offering specialized training programs for PMVs to improve their service quality.

Understanding the perceived benefits and risks of patronizing PMVs is essential for developing public health education campaigns. While residents may appreciate affordability and convenience, they may underestimate the risks of self-medication, improper drug use, and misdiagnosis.[2] This study will help identify misconceptions and gaps in health knowledge, providing a foundation for awareness programs aimed at promoting safer healthcare choices.

Examining the factors associated with PMV utilisation will also offer valuable insights into the socio-economic and cultural drivers of informal healthcare reliance.[2] Suppose factors such as low income, long distances to hospitals, or lack of trust in formal healthcare institutions are found to be significant. In that case, health authorities can design more inclusive policies that address these barriers. Additionally, understanding whether regulatory measures influence PMV utilisation will inform future enforcement strategies to ensure compliance with national health regulations.

Finally, assessing patient satisfaction with PMVs will help gauge the effectiveness and reliability of these vendors as primary healthcare providers. If satisfaction levels are high despite regulatory concerns, it may suggest a need to reform rather than restrict their operations.[6] Conversely, if dissatisfaction is widespread, it will highlight urgent areas for intervention, such as improving quality control and ensuring safer drug distribution practices.[6] The findings from this study will provide actionable recommendations for improving healthcare delivery and patient safety in Ovia North East in compliance with national health regulations.

1.4. RESEARCH QUESTIONS

This research project focused on the following research questions:

1. What types of health services are utilised by residents of Ovia North East Local Government Area from patent medicine stores/vendors?
2. What are the perceived benefits and risks of patronizing patent medicine stores/vendors by residents of Ovia North East Local Government Area?
3. What factors influence the utilisation of patent medicine stores/vendors for the provision of health services to residents of Ovia North East Local Government Area?
4. What is the level of satisfaction of residents of Ovia North East Local Government Area with health services provided by patent medicine stores/vendors?

1.5. OBJECTIVES

This study aims to assess the utilisation of patent medicine stores/vendors for health services and their role in healthcare delivery to residents of Ovia North East Local Government Area.

SPECIFIC OBJECTIVES

1. To identify the types of health services utilised by residents of Ovia North East Local Government Area from patent medicine stores/vendors.
2. To ascertain the perceived benefits and risks of patronizing patent medicine stores/vendors.
3. To identify the factors associated with the utilisation of patent medicine stores/vendors for the provision of health services by residents of Ovia North East Local Government Area.
4. To ascertain the level of satisfaction of residents of Ovia North East Local Government Area with health services provided by patent medicine stores/vendors.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter presents a review of relevant literature related to the utilisation of patent medicine vendors (PMVs) for health services. It examines the types of health services provided and utilised at patent medicine stores, the perceived benefits and risks of patronizing these outlets, factors influencing utilisation, and the level of client satisfaction with services received. The chapter is further anchored on relevant theoretical and conceptual frameworks that explain health-seeking behavior and concludes by identifying gaps in existing literature that justify the present study.

2.1 CONCEPTUAL REVIEW OF PATENT MEDICINE VENDORS

Patent medicine vendors and stores play an increasingly prominent role in healthcare delivery, particularly in low- and middle-income countries where access to formal medical services is limited. In many rural and underserved communities, PMVs serve as the first point of contact for individuals seeking treatment for common illnesses such as malaria, diarrhoea, respiratory infections, and pain. Their widespread patronage is largely attributed to accessibility, affordability, flexible operating hours, and familiarity within communities. Despite their growing relevance, concerns persist regarding the quality of services rendered, safety of medicines dispensed, and the level of regulatory oversight governing their operations.[17]

2.2 THEORETICAL FRAMEWORK

This study is guided by the Health Belief Model (HBM) and supported **by** Andersen's Behavioral Model of Health Service Utilisation.

2.2.1 HEALTH BELIEF MODEL

The Health Belief Model explains health-seeking behavior based on individual perceptions of illness and healthcare options. The model posits that utilisation of health services is influenced by perceived susceptibility to illness, perceived severity, perceived benefits of action, perceived barriers, cues to action, and self-efficacy[18,19]. In relation to patent medicine vendors, individuals may patronize PMVs when they perceive illnesses as mild, believe PMVs offer quick relief, and view barriers such as cost, distance, and waiting time in formal facilities as significant.

2.2.2 ANDERSEN'S BEHAVIORAL MODEL OF HEALTH SERVICE UTILISATION

Andersen's model categorizes determinants of healthcare utilisation into predisposing factors (age, sex, education), enabling factors (income, availability, accessibility of services), and need factors (perceived or evaluated illness).[20] This framework is particularly relevant to PMV utilisation, as residents' socio-demographic characteristics, economic capacity, proximity to PMVs, and perceived need for treatment jointly shape their reliance on these vendors for healthcare services.[21]

2.3 CONCEPTUAL FRAMEWORK

The conceptual framework for this study illustrates the relationship between independent variables, the dependent variable, and intervening factors.

- Independent variables**:** socio-demographic factors, accessibility, affordability, perceived quality of care, and cultural beliefs
- Dependent variable**:** utilisation of patent medicine vendors for health services
- Intervening variables**:** government regulation, availability of formal health facilities, and health policies

These variables interact to influence residents' decisions to utilise PMVs for healthcare needs.

Fig 1: Utilisation of Patent Medicine Vendors for Health services [18,20]

2.4 EMPIRICAL REVIEW

2.4.1. TYPES OF HEALTH SERVICES UTILISED IN PATENT MEDICINE STORES

A qualitative study conducted from 2020 to 2021 in the Shahjalal Uposohor area of Sylhet, Bangladesh, aimed to explore the sociocultural and economic factors that influence drug

purchasing behaviors. The study population comprised customers, patients, drug sellers, and medical representatives. A total of 30 IDIs and 10 KIIs were conducted using purposive sampling.[22] Data were gathered through direct observation, interviews, and KIIs. The study documented that the most frequently utilised medications included antibiotics, painkillers, antidiarrheals, and drugs for chronic diseases such as diabetes and hypertension. Clients often purchased partial doses due to financial limitations.[22] This study excels in uncovering a wide range of utilised services that go beyond simple drug sales, including diagnostic tests (e.g., blood pressure and glucose monitoring), receiving injections, obtaining loans for treatment, and even home visits. Its limitation is that the small sample size makes it difficult to know how commonly these services are utilised across the wider population. The findings could be strengthened by utilizing a larger sample size to measure the frequency of these service utilisations.

An analytical cross-sectional study conducted in 2018 and published in 2024 in the Fatulla and Narayanganj Sadar districts of Dhaka, Bangladesh, assessed the knowledge and practices of retail drug sellers regarding the rational dispensing of antibiotics.[14] Sample population included 294 PMVs. Data were collected through face-to-face interviews using a semi-structured questionnaire. Among the most common services were the purchase of antibiotics, pain relievers, and antimalarials, often done without the necessary prescriptions. This study provides a deep understanding of one utilised service: the negotiation and acquisition of antibiotics. It details practices like dosage advice and partial sales, which are key utilised services. Its major limitation is its exclusive focus on antibiotics, which gives a fragmented view. It fails to capture the full spectrum of utilised services for other common ailments. It would have been more comprehensive if it had broadened its scope to document all health services customers sought, not just those related to a single drug class.

In Uganda, a 2018 analytical cross-sectional study conducted in the Mbarara and Bushenyi districts aimed to characterize private retail drug shops and their role in managing febrile conditions in children under five years old.[23] This descriptive survey involved drug shop vendors and caregivers of young children. The study included 74 drug shops and conducted 428 exit interviews.[23] Registered drug shops were purposively sampled, and data collection involved the use of structured questionnaires, exit interviews, and observational checklists. The findings indicated that commonly sold drugs included antimalarials (95%), analgesics (88%), antibiotics (81%), and oral rehydration salts (63%). PMVs frequently treated common childhood illnesses such as malaria, diarrhea, and respiratory infections.[23] This study provides valuable quantitative data on the specific medicines utilised for managing childhood illnesses, effectively highlighting the role of patent medicine stores as a source for pharmaceuticals like antimalarials and antibiotics. A significant limitation, however, is its narrow focus on childhood febrile illnesses, which fails to capture the full spectrum of health services utilised by the general population. To better understand service utilisation, the research should have included a wider range of client health concerns and directly recorded all services requested during the visit, not just the medicines dispensed.

An analytical cross-sectional study conducted in 2021 examined regulatory compliance among over-the-counter medicine sellers within the Upper East Region of Ghana.[24] The study evaluated 186 facilities to determine their operational practices and adherence to national guidelines. The findings revealed that these facilities provided services extending beyond the dispensing of basic non-prescription drugs, including the unauthorized sale of prescription-only medicines, symptom-based assessments, and informal health consultations. This study is highly relevant to understanding the types of services utilised, as it demonstrates that residents frequently rely on these vendors for diagnostic-like assessments and restricted medications rather than just standard over-the-counter products. However, because the study

focused primarily on regulatory compliance from the perspective of the facilities, it lacked direct documentation of client-vendor interactions. To better address the full scope of utilised services, the research could have incorporated exit interviews or client surveys to directly capture the specific ailments residents presented with and the exact treatments or health advice they actively requested from the vendors.

Another descriptive cross-sectional study conducted in 2021 in Ebonyi State, Nigeria, examined nursing mothers' and young people's access to PMV services in rural communities.[25] The survey-based study involved 159 nursing mothers and 148 youths aged 18–20 years, selected through purposive sampling. Data were collected using 5-point Likert scale questionnaires. The findings revealed that the most frequently purchased drugs were antimalarials (95%), analgesics (88%), and antibiotics (81%). Although family planning services were available, they were underutilised, with only 25% of respondents making use of them. This study is highly relevant as it directly identifies specific health services utilised, such as obtaining antibiotics for childhood respiratory infections, antimalarials, and analgesics. However, it largely overlooked non-drug services like health advice, diagnosis, or referrals that residents might also be utilizing. To better address the topic, it could have asked participants what other services, beyond buying drugs, they received from the PMVs.

A descriptive cross-sectional study conducted in 2020 examined the structure and operations of PMV associations in Nigeria and their role in enhancing service quality.[1] This study took place in rural local government areas within Bayelsa and Oyo States. It involved a combination of quantitative and qualitative approaches, including a cross-sectional survey, focus group discussions (FGDs), and KIIs. The study population comprised PMVs, executives of PMV associations, and representatives of regulatory agencies. The sample size included 160 PMVs for the quantitative aspect, 8 FGDs, and 28 KIIs. Participants were randomly sampled from official association lists. Data collection methods included structured

questionnaires, FGDs, and KIIs. The study found that residents utilised PMVs for essential healthcare services, including malaria treatment (reported by 68.8% of PMVs), antibiotics, and family planning products. A key strength of this study is its specific focus on rural settings in two distinct states, providing valuable insight into how PMV associations function in underserved areas where these shops are most critical. A significant weakness, however, is its reliance on the vendors' and executives' own reports of their monitoring activities without independent verification. The study would be better if it had included client surveys or observations to directly record which services people use when they visit these stores.

2.4.2. PERCEIVED BENEFITS AND RISKS OF PATRONIZING PATENT MEDICINE STORES/VENDORS

A 2024 analytical cross-sectional study conducted in Narayanganj, Bangladesh aimed to assess the knowledge and practices of retail drug sellers regarding the rational dispensing of antibiotics, particularly focusing on nonprescription sales.[14] Using a purposive sampling technique, 294 PMVs were interviewed via face-to-face semi-structured questionnaires. Findings revealed that while 94.5% of sellers had good knowledge about rational antibiotic use, 68.3% demonstrated only average practices, with 76.5% dispensing antibiotics without prescriptions. Younger vendors (aged 21–40) and those with higher client volumes were significantly more likely to engage in nonprescription sales, highlighting accessibility as a perceived benefit but underscoring risks such as antibiotic resistance due to irrational dispensing. The study emphasized the need for stricter regulation and training to mitigate these risks while preserving the convenience of patent medicine vendors. This study clearly demonstrates the major risk of a vast gap between what drug sellers know and what they do, with most selling antibiotics without prescriptions despite knowing it's wrong. Its key

weakness is that it fails to deeply explore why this gap exists, missing the motivations like profit or customer pressure. The study could have been better by interviewing vendors and customers to understand the reasons behind this risky behavior, providing a fuller picture of the economic and social drivers.

A 2018 experimental study conducted in the Matlab sub-district of Bangladesh further explored the role of informal healthcare providers specifically village doctors (PMVs) in the management of childhood illnesses.[26] This study aimed to assess the feasibility of engaging village doctors in community-based Integrated Management of Childhood Illnesses (IMCI) through targeted training.[26] The study design incorporated both quantitative and qualitative methods, including knowledge tests, household surveys, and in-depth interviews.[26] The study population consisted of 144 village doctors who received IMCI training, of which 131 were retained for post-intervention follow-up. Additionally, 20 IDIs were conducted.[26] Data were collected through structured questionnaires, pre- and post-training knowledge assessments, and qualitative interviews with both doctors and caregivers. The findings of this study indicated several perceived benefits associated with village doctors. These providers were highly accessible, frequently visited patients in their homes, and often did not charge consultation fees. They were also trusted by caregivers, many of whom viewed them as effective due to prior positive experiences. However, the study also uncovered critical risks. Inappropriate antibiotic prescriptions were widespread and often driven by financial incentives provided by pharmaceutical companies. The study revealed that despite receiving IMCI training, village doctors' prescribing behaviors were more influenced by the potential for pharmaceutical profit than by clinical need. Furthermore, there was limited adherence to referral protocols for severe illnesses, which could delay appropriate care and contribute to adverse health outcomes. A limitation of this study was that is was part of a supervised

project, so its findings may not reflect the reality of most unsupervised vendors. Further studies with a more diverse sample population may improve results.

A 2018 analytical cross-sectional survey examined private retail drug shops in Mbarara and Bushenyi districts in South Western Uganda. The study aimed to characterize the operational environment of these drug shops and identify factors influencing their dispensing practices, particularly in the context of childhood febrile illnesses.[23] The population included registered patent medicine shops and caregivers of children under five seeking care, with data collected from 74 drug shops and 428 exit interviews. Data collection was performed using semi-structured questionnaires, exit interviews, and on-site observational checklists. The study found that drug shops were perceived as highly beneficial to the communities they served. They were easily accessible, offered flexible operating hours, and provided services on credit. Many community members placed trust in these shops due to their consistent availability and familiarity. However, several risks were also identified. Diagnostic tools such as malaria rapid diagnostic tests (RDTs) were underutilised, leading to presumptive treatment and inappropriate use of medications. The shops frequently dispensed non-recommended medicines, including outdated options like quinine. Furthermore, the study revealed that dispensing decisions were often not guided by national or international treatment guidelines but were instead shaped by client demand, anticipated profitability, and seasonal patterns of illness. A significant weakness is that the study only included legally registered shops, missing the likely riskier practices of unregistered ones. The study would be better if it included the unregistered sector, providing a more complete and realistic assessment of the risks customers face in the entire market.

A qualitative study conducted in 2021 explored perceptions of family planning services provided by PMVs and in Lagos and Kaduna States, Nigeria. The study design consisted of IDIs involving a total of 59 participants, including 11 community pharmacists (CPs), 17

PMVs, and 31 clients.[7] Purposive sampling was used to select participants, and semi-structured interviews served as the primary data collection tool. The findings revealed that clients preferred PMVs over public health facilities due to shorter waiting times, more friendly and approachable service, and overall convenience. Many clients described PMVs using positive descriptors such as "motherly," "respectful," and "patient." In several cases, long-term relationships developed between PMVs and clients, with vendors actively following up on their clients' well-being. PMVs were particularly valued for their accessibility when it came to refilling oral contraceptives and injectables, providing a more convenient alternative to formal healthcare centers. However, despite the positive client experiences, the study noted concerns about the quality of counseling and whether medical guidelines were consistently followed by PMVs. A primary weakness is its limited scope, focusing only on family planning services in two states with a small, purposively sampled population, which constrains the transferability of its findings. The study could have been significantly improved by expanding its geographical and service scope to provide a more comprehensive understanding of the risks and benefits across different healthcare contexts and client demographics.

A 2021 descriptive cross-sectional study assessed access to PMV services among nursing mothers and young people in rural communities in Ebonyi State, Nigeria. The study population consisted of 159 nursing mothers and 148 youths aged between 18 and 20 years, resulting in a total sample size of 307 participants.[25] Purposive sampling was used, and data were collected using 5-point Likert scale questionnaires. The study found that over 60% of respondents identified PMVs as their first point of care, citing factors such as geographical proximity, affordability, and quick service as key reasons. Major concerns identified by respondents included the sale of substandard drugs (35.6%) and a lack of formal training among PMVs (30.1%). The study concluded that although PMVs significantly improve

healthcare access in rural areas, there are persistent concerns about drug misuse and quality of service. A significant limitation was the inclusion of only nursing mothers and youth in the study. Inclusion of the general population would provide more comprehensive understanding of the risks and benefits associated with patronizing PMVs.

The cumulative findings from these studies highlight a dual reality in the utilisation of PMVs. On one hand, the perceived benefits are substantial: PMVs are seen as accessible, affordable, and user-friendly providers of essential healthcare services, particularly in rural and underserved areas. Clients report satisfaction with the speed of service, the convenience of location, and the interpersonal dynamics with vendors. For family planning and minor illnesses, many clients prefer PMVs over formal healthcare facilities. On the other hand, significant risks are associated with PMV patronage. These include the widespread sale of antibiotics without prescriptions, improper drug storage practices, and a general lack of formal medical training among many vendors. These practices contribute to the growing public health challenges of antimicrobial resistance, treatment failures, and exposure to substandard or degraded medications.

2.4.3. FACTORS ASSOCIATED WITH THE UTILISATION OF PATENT MEDICINE STORES/VENDORS FOR PROVISION OF HEALTH SERVICES

In Ghana, a descriptive cross sectional study done in 2018 implemented a randomized field experiment to assess the impact of differential health insurance subsidies (full, partial, or none) on longer-term healthcare utilisation in rural settings.[27] Their work revealed that although both full and partial subsidies boosted insurance enrollment, only partial subsidies led to sustained increases in healthcare usage after three years likely due to stronger learning and self-selection effects among participants. This finding confirms that affordability is a

powerful driver of utilisation. Nevertheless, since the study focused on formal care rather than PMVs directly, its application to the informal vendor context remains speculative.

The Seven Communities East and West Africa (SevenCEWA) network conducted a qualitative study across Uganda and Kenya in 2021 to explore community attitudes towards primary healthcare providers, including PMVs [28].Through interviews and focus groups, researchers found that PMVs were favored due to their affordability, proximity, convenient hours, and flexible payment options, alongside shorter wait times. However, community members also expressed concerns about PMVs' diagnostic accuracy and medication practices, demonstrating the tension between access and quality. A limitation of this study is its reliance on subjective perceptions without objective outcome data, and the results may not generalize beyond the studied locales.

Within Nigeria, a mixed-method process evaluation conducted by the Association for Reproductive and Family Health (ARFH), the Society for Family Health (SFH), and the Joint Outcome Planning and Policy Platform (JOPPP) in 2021 assessed a pilot initiative aimed at training Patent and Proprietary Medicine Vendors (PPMVs) to deliver injectable contraceptive services in Lagos and Kaduna States [29]. The study employed a combination of qualitative interviews and quantitative service delivery data to evaluate feasibility, acceptability, and provider performance. Findings revealed high levels of client satisfaction, notable enthusiasm among providers, and demonstrable improvements in service delivery capacity. These outcomes underscore the potential of structured training and tiered accreditation models to strengthen the quality and scope of services provided by PPMVs. However, the evaluation was limited by its non-randomized design, small sample size, and potential for selection bias, which collectively constrain the generalizability of its findings to broader populations or policy settings.

A complementary quantitative census of medicine vendors was conducted across Lagos and Kaduna States between February and September 2018, capturing comprehensive data from over 4,000 outlets. This descriptive cross-sectional study, published in Human Resources for Health, revealed that only 28.2% of the vendors possessed formal medical training [30]. These trained providers were significantly more likely to stock family planning commodities, such as contraceptives, compared to their untrained counterparts. The study also exposed substantial urban–rural disparities in vendor qualifications, with urban locations having higher densities of better-trained providers and broader product availability. The use of geographic information systems (GIS) and structured surveys contributed to the methodological rigor and credibility of the findings. However, the study primarily focused on provider-level characteristics and did not assess consumer behavior, client outcomes, or the appropriateness of care, which limits its applicability in understanding the full spectrum of service effectiveness and demand-side utilisation.

A descriptive cross- sectional study in 2023 conducted by the IntegratE Project team examined the perceptions of a tiered accreditation program among 224 Patent and Proprietary Medicine Vendors (PPMVs) and community stakeholders across Lagos and Kaduna States [31]. This intervention sought to evaluate the acceptability and feasibility of formally integrating PPMVs into Nigeria's primary healthcare framework through standardized training and regulatory oversight. The findings indicated widespread approval of accreditation among PPMVs, who cited increased client trust, business growth, and professional credibility as key benefits. Multivariate analysis revealed that willingness to pay for accreditation was significantly associated with higher educational attainment and urban location. Nonetheless, the study also highlighted persistent barriers to community uptake of PPMV services, including myths surrounding contraceptive use, fear of side effects, and opposition from male

partners. A key limitation was the reliance on self-reported data, which restricts the ability to infer actual improvements in service quality or sustained behavior change.

In 2024, a policy analysis published in Health Research Policy and Systems examined the challenges and opportunities associated with scaling up the accreditation and training of Patent and Proprietary Medicine Vendors (PPMVs) within Nigeria's health system[32]. Drawing on stakeholder interviews, national policy reviews, and implementation reports from programs such as IntegratE, the analysis highlighted several prerequisites for sustainable scale-up. Chief among these were the need for consistent and ring-fenced funding streams, stronger integration with public health systems, and the development of flexible, community-sensitive training models tailored to the varying competencies of PPMVs. The study emphasized that effective scale-up is not solely technical, but also political, requiring inter-agency collaboration and policy coherence. However, a notable limitation of the analysis is the absence of empirical evaluation data linking accreditation reforms to measurable improvements in health service quality or client health outcomes.

2.4.4. LEVEL OF SATISFACTION WITH HEALTH SERVICES PROVIDED BY PATENT MEDICINE STORES/VENDORS

Although Europe does not support a structured PPMV-like system, certain studies examining non-pharmacy drug outlets or community-based dispensaries offer comparable insights. A 2019 national survey in Portugal evaluated client satisfaction across more than 2,000 community pharmacy users. Respondents reported high levels of satisfaction, approximately 76%, particularly regarding the politeness of staff, ease of medicine access, and prompt service. However, lower satisfaction scores were associated with inadequate counseling on

side effects and a lack of privacy during consultations[33]. While these were regulated pharmacies, the client-centered nature of satisfaction closely parallels that found among PMV patrons in informal settings. The study, however, did not assess satisfaction with unlicensed or informal providers, limiting its direct application to PMV contexts.

A descriptive cross-sectional study, conducted in the Afyonkarahisar province of Turkey in 2022, surveyed 402 pharmacy users in rural settings to evaluate which service attributes most strongly influenced patient satisfaction and loyalty [34]. Using a structured questionnaire and a structural equation modeling (SEM) approach, the researchers explored five core variables: medicine supply, pharmacy environment, staff communication and attitude, promptness of service, and overall satisfaction. One of the most striking findings was that medicine supply reliability was the strongest predictor of satisfaction. This suggests that in resource-constrained rural environments, consistent access to essential medications remains the cornerstone of patient trust and satisfaction. Drug shortages, particularly of chronic disease medications and pediatric formulations, are common in rural Turkey. Pharmacies that successfully mitigate these shortages become not only dispensers of drugs but critical access points for continuity of care. This finding aligns with broader public health literature emphasizing the importance of availability as a basic building block of healthcare quality. Another significant contributor to satisfaction was the physical environment of the pharmacy. Cleanliness, appropriate lighting, ventilation, and the presence of private counseling spaces all emerged as important determinants of a positive patient experience. While this may appear superficial in more urban or specialized healthcare settings, in rural communities where formal healthcare infrastructure may be limited, the aesthetic and functional quality of care environments significantly shapes user perceptions and their willingness to return. The communication and interpersonal demeanor of pharmacy staff also played a vital role. Patients valued pharmacists who offered respectful, empathetic, and understandable

explanations about medications. This aligns with other international studies, which underscore pharmacist–patient communication as a key driver of satisfaction, especially in populations with lower health literacy or limited healthcare options. Promptness of service did not significantly influence satisfaction in this study. This finding may reflect a cultural or contextual dynamic wherein rural patients are more tolerant of wait times, provided the overall service quality remains high [34]. It challenges conventional assumptions about the primacy of speed in patient satisfaction frameworks and suggests that rural pharmacy clients prioritize quality and reliability over immediacy. The study demonstrated a strong positive correlation between satisfaction and loyalty, indicating that satisfied patients were more likely to return to the same pharmacy and recommend it to others. This reinforces the idea that patient satisfaction in rural health systems is not just a subjective metric but a key driver of health-seeking behavior and service sustainability. The study provides valuable empirical insights, but several limitations warrant consideration. The reliance on self-reported data introduces potential bias, including social desirability and recall inaccuracies. Additionally, the study is limited in scope to a single Turkish province, which may restrict the generalizability of its findings. Moreover, the study did not assess clinical outcomes, such as medication adherence or health improvements, making it difficult to determine whether high satisfaction translated into better health metrics. Nonetheless, this research contributes significantly to the understanding of rural pharmaceutical care by illustrating how non-clinical factors, supply chain stability, environmental conditions, and interpersonal communication, profoundly shape user satisfaction. These findings are particularly relevant when drawing parallels with patent medicine vendors in low- and middle-income countries, who often function without formal regulation but are valued for their accessibility and responsiveness.

In Ghana, Licensed Chemical Sellers (LCSs) are the recognized equivalent of PPMVs. A 2020 mixed-methods study by Mensah and colleagues involved 200 clients in peri-urban and rural districts. It revealed that 82% of clients expressed satisfaction with LCS services, attributing this primarily to proximity, the speed of service, and the vendors' respectful interactions.[35] Nonetheless, a substantial portion, about one-third, reported that drug instructions were either incomplete or unclear, raising concerns about misuse or subtherapeutic outcomes. The study concluded that while LCSs were trusted and widely utilised, their capacity for correct pharmaceutical counseling was limited by training and regulation gaps.

A notable contribution to the understanding of client satisfaction with informal healthcare providers, including patent and proprietary medicine vendors (PPMVs), comes from the Seven Communities East and West Africa (SevenCEWA) study published in 2021[28]. This qualitative multi-country investigation, conducted across seven communities in East and West Africa, including Ghana, Uganda, and Kenya, explored perceptions of access and quality of primary healthcare services, with specific attention to experiences with PPMVs and similar informal providers. The study utilised in-depth interviews and focus group discussions with community members, local health workers, and medicine vendors to capture nuanced perspectives on service delivery and satisfaction.

In the West African sites, particularly Ghana, participants consistently expressed high levels of satisfaction with the services offered by PPMVs. Several factors contributed to this satisfaction, most notably the affordability of drugs, convenient locations, extended or flexible operating hours, and the willingness of vendors to offer credit or deferred payment options. These practical advantages, often unavailable in formal health settings, positioned PPMVs as the first point of contact for a variety of minor ailments and basic health needs. As

one respondent noted: *"If you didn't have enough money, the PMV would let you bring it later; I was satisfied."* This quote captures the relational and economic dynamics underpinning client satisfaction, elements that extend beyond clinical competence. Despite this widespread satisfaction, the study also uncovered significant concerns. Clients acknowledged the risk of misdiagnosis, the frequent sale of expired or poorly stored medications, and the lack of diagnostic or counseling support. These risks were often tolerated because of the vendors' social embeddedness and practical accessibility. Thus, while satisfaction was high, it was not necessarily reflective of technical quality or safety. This highlights a central theme across many LMIC contexts: that satisfaction is often a function of accessibility and interpersonal trust, rather than an indication of appropriate or high-quality clinical care. Critically, the SevenCEWA study's strength lies in its depth of qualitative data, allowing for rich, contextualized understanding of health-seeking behavior in underserved communities. However, its lack of standardized satisfaction metrics, such as structured Likert scales or validated satisfaction instruments, limits its ability to compare across settings or quantify the magnitude of satisfaction. Moreover, because the findings are drawn from multiple countries with different health systems and levels of PMV integration, the study's specificity to any single national context, such as Côte d'Ivoire or Sierra Leone, is limited. Nevertheless, its thematic insights remain broadly applicable across similar informal health service environments in West Africa.

In Nigeria, where PPMVs are formally recognized and regulated under a tiered accreditation system, more structured evaluations have been conducted. A 2019 observational study in Oyo State by Ajayi et al. examined over 100 PMV client encounters in both rural and urban settings. Clients frequently expressed satisfaction with the respectful and prompt services they received. Despite the informal nature of the consultations, many users described PMVs as more "attentive" and "understanding" than staff in overburdened public hospitals.

However, the same study observed numerous breaches of pharmacologic best practices, including inappropriate antibiotic dispensing and limited inquiry into client symptoms. This duality of satisfaction amidst technical gaps was a key finding[36].

Another Nigerian study, conducted in 2021 in Ebonyi State, evaluated the integration of PMVs into tuberculosis (TB) referral networks by Uzochukwu et al. Though the primary outcome was feasibility, qualitative data revealed that clients valued the recognition of PMVs as formal health partners and expressed confidence in their expanded roles. Many clients who had previously used PMVs for general ailments reported a heightened sense of safety after the vendors underwent training and became part of the TB referral system. Nonetheless, the study did not employ a standardized satisfaction instrument, relying instead on inferred trust and utilisation as proxies for satisfaction[37].

2.5 SUMMARY OF LITERATURE REVIEW/ RESEARCH GAP

A critical synthesis of the reviewed literature reveals several evidence-based measures necessary for improving the quality, safety, and effectiveness of services provided by patent medicine vendors (PMVs). Existing studies indicate that PMVs play a significant role in healthcare delivery, particularly in underserved and resource-limited settings, thereby necessitating targeted interventions to optimize their contribution to public health.[14,25,26]

The literature consistently reports weak enforcement of pharmaceutical regulations, with many PMVs operating beyond their legally approved scope of practice. Commonly reported issues include the sale of prescription-only medicines without authorization and non-adherence to standard treatment guidelines.[14,23,24,26] Strengthening regulatory oversight through regular inspections, enforcement of licensing requirements, and application of

appropriate sanctions for non-compliance has been widely recommended to improve service quality and safeguard public health.[23,25,26]

Several studies identify inadequate formal training among PMVs as a major contributor to inappropriate drug dispensing, mismanagement of common illnesses, and poor referral practices.[25,30,31] The literature strongly supports the implementation of structured training programs, periodic refresher courses, and competency-based accreditation systems. Evidence indicates that trained PMVs demonstrate improved knowledge, better dispensing practices, and increased compliance with referral guidelines.[29,30,31]

Given their accessibility and high level of community patronage, the literature recommends the strategic integration of PMVs into the formal primary healthcare system. This includes establishing referral linkages, supportive supervision, and collaboration with nearby health facilities.[26,29,32] Such integration has been shown to improve early detection of illnesses, continuity of care, and appropriate referral, particularly for common conditions such as malaria and childhood illnesses.[29,32]

Although PMVs are widely patronized, studies report notable deficiencies in medication counseling and patient education. Clients often receive limited information on correct dosage, duration of treatment, possible side effects, and drug interactions.[28,33,35] Strengthening counseling skills among PMVs has been recommended as a key strategy for improving treatment adherence, reducing inappropriate medication use, and enhancing overall health outcomes.[28,35,36,37]

Affordability, proximity, and convenience are consistently identified as major factors influencing the utilisation of PMVs, especially among rural and low-income populations.[27,28] The literature emphasizes that health policies should recognize these socioeconomic realities.

Supporting PMVs through regulated supply chains, access to affordable essential medicines, and improved monitoring may help balance accessibility with patient safety.[27,28]

Despite extensive research on PMVs, many studies focus primarily on provider practices or specific disease conditions, with limited emphasis on community-level utilisation patterns and user perceptions.[24,25,37] The literature therefore highlights the need for community-based studies that explore reasons for utilisation, perceived quality of care, and levels of client satisfaction. Such context-specific evidence is essential for informing locally appropriate interventions, including those targeted at residents of Ovia North East Local Government Area.

These literature-driven recommendations underscore the importance of examining utilisation patterns, reasons for preference, and perceived quality of services provided by patent medicine vendors. By focusing on residents of Ovia North East Local Government Area, this study contributes localized evidence that can inform regulatory enforcement, training initiatives, and policy decisions aimed at improving the safety and effectiveness of PMV-provided health services.

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

This study was carried out among residents of Ovia North east Local Government area, Edo State, Nigeria. The Ovia North East Local Government Area occupies a significant portion of the northern reach of the Edo South Senatorial District, spanning approximately 2,301 square kilometers, making it one of the larger administrative territories in Edo State, with a varied landscape that includes both rural and more urbanized areas.[34] Its headquarters are located in Okada, a town of national significance noted for higher education and private investment, including Igbinedion University.[38]

Administratively, the area lies roughly within longitude 5°14′20″ E to 5°54′42.10″ E and latitude 5°50′34.80″ N to 6°46′58.80″ N, positioning it strategically within the state's geography.[39] According to the standard NPC/National Bureau of Statistics growth rate for Edo State., Ovia North East has a projected population of 246,615, predominantly comprising various ethnic groups including the Bini (Edo) and Ijaw, with local languages such as Bini and Edo widely spoken.[40] This positioning situates the LGA as a gateway between the metropolitan hub of Benin City and the agricultural heartlands of the state.

The LGA shares borders with several administrative entities. It is bounded on the west by Ondo State, stretches toward Kogi State in the north, and locally interfaces with neighboring LGAs such as Ovia South West, Egor, Oredo, and Uhunmwonde.[39] These boundaries are not only political but also represent cultural and economic transit corridors facilitating movement of people and goods.

For administrative and service delivery purposes, Ovia North East is divided into thirteen political wards, including Okada East, Okada West, Uhen, Oluku, Uhiere, Isiuwa, Oghede, Oduna, Utoka, Iguoshodin, Kokhuo (Okokhuo), Adolor, and Ofun-mwengbe.[41] This ward structure influences the spatial distribution of Primary Health Care (PHC) centers, which have been reported to follow a clustered rather than equitable pattern; some wards like Uhiere and Oduna have multiple centers while others have relatively few, creating geographic barriers to access and driving residents toward informal providers such as patent medicine vendors (PMVs) in underserved zones.[41]

Geographically, Ovia North East lies within the tropical rainforest belt of southern Nigeria, experiencing the characteristic distinct rainy and dry seasons of the region, and generally flat fertile terrain that supports agriculture as a major economic activity alongside trade and small-scale manufacturing.[42] The local economy is sustained by farming and trading, and professional services particularly around urban centers like Okada, which hosts Igbinedion University.[42]

Healthcare services in the area comprise both formal facilities (clinics and hospitals) and a significant presence of informal providers; these formal facilities include PHCs and private hospitals such as Igbinedion University Teaching Hospital in Okada, which serves the broader community. This mixed healthcare environment underscores Ovia North East LGA

as a pertinent setting for studying the utilisation of patent medicine stores for health services by local populations.

3.2 STUDY DESIGN

This study adopted a descriptive cross-sectional study design to assess the utilisation of patent medicine vendors (PMVs) for health services among residents of Ovia North East Local Government Area (LGA), Edo State.

3.3 STUDY POPULATION

This study was carried out among residents of Ovia North east Local Government area, Edo State, Nigeria.

3.4 SELECTION CRITERIA

3.4.1 INCLUSION CRITERIA

a. Residents of Ovia North East Local Government Area, Edo State.

b. Men and women aged 18 years and above.

c. Residents who have lived in the LGA for at least six months.

d. Individuals who have utilised patent medicine vendors/stores for health services within the past 12 months.

3.4.2 EXCLUSION CRITERIA

a. Residents below 18 years of age.

b. Visitors or temporary residents of the LGA.

c. Residents who have never used patent medicine vendors.

d. Individuals who were seriously ill or unable to respond at the time of data collection.

3.5 STUDY DURATION

The study was conducted over a period of one year, from April, 2025 to April, 2026. The timeline was as follows:

- Conceptualization and initial write-up: April to September, 2025
- Materials and Methods: September 2025 to February, 2026
- Ethical Approval: February to March, 2026
- Data Collection and Results: March to April, 2026
- Discussion and Conclusion: April, 2026

3.6 SAMPLE SIZE DETERMINATION

This was calculated using Cochran's formula for descriptive study.

$$n = \frac{z^2pq}{d^2} \times 1.5$$

Where,

Deff = design effect =1.5

n = minimum sample size

z = standard normal deviation

p = prevalence or proportion of population with characteristic of interest

q = 1 – p

d = degree of precision desired.

z = standard normal set at 1.96 (at 95% confidence interval)

p = 31.3% (A 2021 Cross sectional study on the an assessment of nursing mothers' and young people's access to proprietary and patent medicine vendors' services in rural communities of south-eastern Nigeria)[21]

q = 1-0.313 = 0.687

d = degree of precision desired set at 0.05

Substituting the above in the equation

$n = [(1.96)^2 \times (0.313)\ (0.687)]/(0.05)^2] \times 1.5$

n = 494

To make room for non-response, 10% non-response rate was added to the minimum sample size, utilising the formula for non-response rate.

nf = n/(1– nr)

n = Minimum sample size = 494

nr = Non-response rate = 10% = 0.10

nf = Final Minimum sample size

nf = 494/(1 – 0.10)

nf = 494/0.90 = 548.9

nf = 549

Thus, the minimum sample size used for this study was **549**.≈ **550**

3.7 SAMPLING TECHNIQUE

This study utilised a multistage sampling technique to select residents of Ovia North-East Local Government Area who have used patent medicine vendors for health services. The approach intended to capture participants from different parts of the LGA to ensure good geographical spread, while maintaining methodological soundness for a cross-sectional study.

It was also designed to be practical and achievable within the scope of a student research project.

First Stage: Selection of Wards

The sampling process began with the selection of wards from the of the LGA's thirteen political wards. Six (6) wards were selected using a simple random sampling technique by balloting. The wards chosen included- Adolor, Isiuwa, Okada west, Oluku, Iguoshodin, Uhiere.

Second Stage: Selection of Communities

Within each of the six selected wards, ten (10) communities were selected using a simple random sampling technique by balloting with a minimum of one community per ward. This simple random selection at the community level introduced a critical element of probability sampling, helping to minimize selection bias and enhance the generalizability of findings within each ward. providing a geographically dispersed set of data collection points.

Third Stage: Household and Respondent Selection

The final stage involved the selection of households and individual respondents within each chosen community. A simple random sampling technique was then applied to choose the households. Upon reaching a selected household, the interviewers listed all adult members (aged 18 years and above) who meet the inclusion criteria, particularly having used a patent medicine vendor in the past twelve months. Where multiple eligible adults were present, one respondent was selected by simple random sampling by balloting.

3.8 DATA MANAGEMENT

3.8.1 DATA COLLECTION TOOL

The tool that was used for the survey was a structured self-administered/ interviewer administered questionnaire (for illiterate respondents), using both paper based on google form mediums. This questionnaire was modified by the researchers using information from literature reviews and questionnaires of previous studies[25,43,44] The questions on each section consisted of open and closed questions. The questionnaire was divided into 5 sections as follows:

Section A: Socio-demographic characteristics of the respondents

This section seeks information regarding the basic background of the residents in Ovia North East LGA. It includes questions on the respondents' age, gender, marital status, and ethnicity. Furthermore, it assesses socioeconomic indicators such as religion, highest level of educational attainment, occupation, and average monthly income.

Section B: Patterns and types of health services utilised

This section focuses on the frequency and nature of health services sought from PMVs within the last 12 months. It identifies specific health conditions treated, including:

- Infectious diseases such as malaria, fever, and respiratory symptoms.
- Gastrointestinal issues like diarrhea.

- Reproductive health services, including family planning products and STI treatments.
- General primary care such as pain relief, skin problems, and nutritional supplements.

Section C: Perceived benefits and risks of PMV utilisation

This section assesses the respondents' attitudes toward PMVs through two lenses:

- **Perceived Benefits:** This identifies reasons for patronage, such as proximity to home, cost-effectiveness (cheaper services), speed of service (short waiting times), and availability after hours. It also gauges the level of trust in a vendor's advice and treatment outcomes.
- **Perceived Risks:** This seeks to identify concerns regarding the quality of care, such as the sale of medicines without prescriptions, potential for expired or poor-quality drugs, lack of formal training for vendors, and the risk of delayed medical care or incorrect dosing.

Section D: Determinants of utilisation of Patent Medicine Vendors

This section seeks to identify the specific factors that drive a resident's decision to choose a PMV over formal health facilities. It includes variables such as:

- **Economic factors:** Cost of services and flexible payment options (e.g., buying on credit).
- **Physical factors:** Proximity to the residence, distance traveled, and flexible operating hours.
- **Social and Technical factors:** Recommendations from family and friends, perceived knowledge and skill of the vendor, and overall trust in PMVs compared to formal healthcare facilities.

Section E: Satisfaction and Future Intentions

The final section focuses on evaluating the overall experience of the respondents. It identifies the general level of satisfaction with PMV services and assesses the likelihood of continued utilisation or the willingness of the resident to recommend PMVs to others in the community.

3.8.2 METHODS OF DATA COLLECTION

The questionnaires were numbered and administered. Questionnaires were collected from the respondents either on the same day of administration or not more than two days after.

3.8.3 PRE-TESTING

The questionnaire was pre tested with ten percent (10%) of the sample size of 550 which is 55. It was pre-tested in Egor Local Government Area, Edo state. This helped to validate the questionnaire, identify errors and helped point out corrections that were effected in the final questionnaire before it was used.

3.8.4 TRAINING OF RESEARCH ASSISTANTS

A team of five research assistants was recruited and trained. The training ensured familiarity with the questionnaire structure and the capacity to address respondents' queries across its sections.

3.8.5 DATA ANALYSIS

The completed questionnaire was checked for a completeness and uniformity, coded and entered into the computer for analysis using IBM SPSS version 27.0.

SCORING SYSTEM ON SOCIO-DEMOGRAPHICS CHARACTERISTICS

Age

The age of respondents was grouped into ≤ 24, 25-44, 45-59 and ≥60 years.[45]

Scoring of Education[46]

Level 0: No formal education or incomplete primary education

Level 1: Completed primary education or incomplete secondary education

Level 2: Completed secondary education

Level 3: Tertiary education

Scoring of Monthly Household Income[46]

Score 1: ≤ ₦70,000

Score 2: ₦70,000 – ₦150,000

Score 3: > ₦150,000 - ₦300,000

Score 4: >₦300,000

Scoring of Occupation

The modified ILO's (International Labour Organization) the International Classification of Occupations (ISCO) dividing skill levels into skill level 0 to 4 was used [47]

Using the modified international labour classification:

Skill level 0: Unemployed, student, retired

Skill level 1: Unskilled labour

Skill level 2: Clerks, service and sales workers; plant operators

Skill level 3: Technicians and associate professionals

Skill level 4: Professionals, managers

Scoring of Socioeconomic Status

The scoring of the socioeconomic status of respondents in Ovia North East LGA was based on a revised scoring system developed in 2021.[46]

This scoring combines level of education, ILO skill level and monthly household income.

A total score of 9 was given for socioeconomic status:

High socioeconomic status: 7-9

Middle socioeconomic status: 4-6

Low socioeconomic status: 1-3

Descriptive statistics were used to summarize and present the data. For Section A, the sociodemographic characteristics of respondents were described using frequencies and percentages, including variables such as age, sex, educational level, occupation and socio-economic status. This provides a clear profile of the study population. In Section B, which assessed utilisation of PMV services, proportions of respondents who utilised specific services were computed to identify the most commonly accessed services.

Section C of the questionnaire assessed respondents' perceptions of the benefits and risks associated with patronizing patent medicine vendors. Responses were captured on a five-point likert scale ranging from "Strongly Disagree" to "Strongly Agree." To facilitate clearer interpretation and presentation, these responses were recoded into binary variables. For each item, responses of "Agree" and "Strongly Agree" was combined to represent an affirmative perception (coded as "Yes"), while "Neutral," "Disagree," and "Strongly Disagree" were combined to represent a non-affirmative perception (coded as "No"). Frequencies and percentages were then computed for each of the seven benefit items and seven risk items. Section D examined factors influencing respondents' decisions to utilise patent medicine vendor services. Similar to Section C, responses were initially recorded on a five-point likert scale. For analysis, responses were dichotomized: "Agree" and "Strongly Agree" were combined to indicate that the factor influences utilisation (coded as "Yes"), while "Neutral," "Disagree," and "Strongly Disagree" were combined to indicate no influence

(coded as "No"). Frequencies and percentages were calculated for each of the ten determinant items. The resulting data were displayed in a table to highlight the most and least influential factors driving PMV patronage among respondents.

Section E assessed the level of satisfaction of respondents with health services provided by patent medicine stores/vendors.

SCORING SYSTEM ON SATISFACTION WITH PMV SERVICES

Scoring for Q28 & Q29, The 5-point scales were converted to numbers.

Very Satisfied/Very Likely = 5 points

Satisfied/Likely = 4 points

Neutral = 3 points

Dissatisfied/Unlikely = 2 points

Very Dissatisfied/Very Unlikely = 1 point

Scoring for Q30 (Recommendation): This is binary.

Yes = 1 point

No = 0 points

A maximum score of 11 was attainable. Respondents with scores ≥70% were assessed to be satisfied and those with scores <70% were assessed to be unsatisfied.[48]

Inferential analysis was carried out on sections B,C and E. Chi-square tests were used to assess associations between sociodemographic characteristics and outcome variables. Binary logistic regression analysis were performed to identify statistically significant predictors of these outcome variables..

All statistical tests were carried out at a 95% confidence level, with a p-value of less than 0.05 considered statistically significant. The findings were presented using tables and simple charts, with clear explanations to support interpretation and answer the research questions.

3.8.6 DATA PRESENTATION

Results were presented in prose and frequency tables.

3.9 ETHICAL CONSIDERATIONS

Ethical Approval to carry out the study was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital.

A cover letter was obtained from the Department of Community Health, University of Benin. Ethical approval with protocol number ADM/E 22/A/VOL. VII/1486549127299 was obtained from the Health Research Committee (HREC), University of Benin Teaching Hospital.

Informed consent was obtained from all participants, ensuring that they fully understood the purpose, procedures, and potential implications of the study. Participation was entirely voluntary, with individuals having the right to withdraw from the study at any time without facing any form of penalty. Additionally, strict confidentiality measures were maintained throughout the research process. All collected data were anonymized, and no identifying information was published, thereby safeguarding the privacy and rights of the participants.

3.10 LIMITATIONS TO THE STUDY

The information obtained was based on self-reporting and for that reason, was susceptible to recall bias. Other limitations included; reporting bias where respondents may have selectively suppressed or revealed information and there is no means of verification, and language

barrier, as some respondents only spoke their local dialect. To mitigate these biases, the recall period was limited to the past 12 months to improve accuracy, and trained research assistants were utilised to provide standardized translations and clarifications where necessary. Furthermore, to minimize reporting bias, absolute anonymity was guaranteed by instructing respondents not to write their names, and the research purpose was clearly explained to ensure respondents felt comfortable providing honest answers without fear of judgment or penalty.

CHAPTER 4

RESULTS

Five hundred and fifty (550) respondents participated in the study. The results were divided into sections as follows:

Section A: Socio-demographic characteristics of respondents

Section B: Types of Health Services utilised in patent medicine stores/vendors

Section C: Perceived benefits and risks of patronizing patent medicine stores/vendors

Section D: Factors associated with the utilisation of patent medicine stores/vendors

Section E: Level of satisfaction of residents with health services provided by patent medicine stores/vendors.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1a: Sociodemographic characteristics of respondents

Variable	Frequency (n=550)	Percent
Age Group (Years)		
≤24	261	47.5
25 – 44	216	39.3
45 – 59	57	10.4
≥60	16	2.9
Mean ± Standard deviation	**29.0 ± 13.5**	
Sex		
Male	246	44.7
Female	304	55.3
Religion		
Christianity	537	97.6
Islam	10	1.8
Atheist	2	0.4
African Traditional Religion	1	0.2
Tribe		
Benin	148	26.9
Esan	126	22.9
Igbo	68	12.4
Urhobo	54	9.8
Yoruba	53	9.6
Etsako	31	5.6
Owan	31	5.6
Isoko	11	2.0
Hausa	8	1.5
Itsekiri	4	0.7
Ijaw	4	0.7
Ibibio	3	0.5
Ika	3	0.5
Okpamheri	1	0.2
Ogoja	1	0.2
Igbanke	1	0.2
Igede	1	0.2
Ebira	1	0.2
Ukwani	1	0.2
Marital Status		
Single	392	71.3
Married	144	26.2
Cohabiting	5	0.9
Widowed	4	0.7
Separated	3	0.5
Divorced	2	0.4

Table 1b: Sociodemographic characteristics of respondents contd.

Variable	Frequency (n=550)	Percent
Level of Education		
No formal education	3	0.5
Primary	5	0.9
Secondary	89	16.2
Tertiary	453	82.4
Occupation		
Skill Level 0	229	41.6
Skill Level 1	36	6.5
Skill Level 2	100	18.2
Skill Level 3	63	11.5
Skill Level 4	122	22.2
Monthly Income (₦)		
<70,000	223	40.5
>70,000 – 150,000	174	31.6
>150,000 – 300,000	102	18.5
>300,000	51	9.4
Socioeconomic Status		
Low	3	0.5
Middle	302	55.0
High	245	44.5

A total of 550 residents participated in the study. The sample was largely composed of young adults; 261 (47.5%) were aged 24 years or younger, while 216 (39.3%) were aged between 25- 44 years. Females 304 (55.3%) were slightly more represented than males 246 (44.7%), and a majority of the respondents, 392 (71.3%), were single. In terms of ethnic distribution, the Benin 148 (26.9%) and Esan 126 (22.9%) groups were the most prominent, and religious affiliation was nearly universal, with 537 (97.6%) identifying as Christian. The cohort was highly educated, as 453 (82.4%) had attained a tertiary level of education. Concerning occupational, workers in skill level 0 formed the largest group, totaling 229 (41.6%). Regarding financial status, 223 (40.5%) respondents reported a monthly income of less than ₦70,000, while the broader socioeconomic classification placed 302 (55.0%) in the middle-status bracket and 245 (44.5%) in the high-status category.

SECTION B: TYPES OF HEALTH SERVICES UTILISED IN PATENT MEDICINE STORES

Table 2: Types of health services utilised by respondents at patent medicine stores within the last 12 months

Health Service / Condition	Never n (%)	Once n (%)	A few times n (%)	Often n (%)
Malaria treatment/ antimalarials	43 (7.8)	89 (16.2)	264 (48.0)	154 (28.0)
Fever (general) symptoms	109 (19.8)	116 (21.1)	254 (46.2)	71 (12.9)
Cough / cold or respiratory symptoms	126 (22.9)	92 (16.7)	270 (49.1)	62 (11.3)
Diarrhoea treatment / ORS	304 (55.3)	75 (13.6)	147 (26.7)	24 (4.4)
Headache or pain relief (analgesics)	87 (15.8)	82 (14.9)	257 (46.7)	124 (22.5)
Family planning products (condoms, pills)	439 (79.8)	24 (4.4)	75 (13.6)	12 (2.2)
Reproductive health advice	439 (79.8)	39 (7.1)	61 (11.1)	11 (2.0)
Treatment of STIs / sexual health concerns	487 (88.5)	34 (6.2)	20 (3.6)	9 (1.6)
Treatment of skin problems	322 (58.5)	126 (22.9)	86 (15.6)	16 (2.9)
Referral to a clinic / health facility	319 (58.0)	118 (21.5)	98 (17.8)	15 (2.7)
Vaccination advice (non-administered)	397 (72.2)	64 (11.6)	77 (14.0)	12 (2.2)
Nutrition or vitamin / mineral supplements	237 (43.1)	109 (19.8)	160 (29.1)	44 (8.0)

The most frequently utilised services at patent medicine stores in the past 12 months were for malaria treatment, with 269 (92.2%) of respondents reporting use at least once and 154(28.0%) using it often. Headache and pain relief (analgesics) were also commonly sought,

with 463 respondents (84.2%) ever using and 124 (22.5%) using often. General fever symptoms and cough or respiratory symptoms were utilised by 441 (80.2%) and 424 (77.1%) of respondents respectively, with the majority using these services a few times 254 (46.2%) and 270 (49.1%) respectively. In contrast, services related to sexual and reproductive health were markedly less utilised. Family planning products, 439 (79.8%) never used, reproductive health advice, 439 (79.8%) never used, and STI treatment, 487 (88.5%) never used. Referral services and vaccination advice were also infrequently accessed, with 319(58.0%) and 397 (72.2%) respectively reporting no use in the past year. Nutrition or vitamin supplements showed moderate utilisation, with 313 (56.9%) having used them at least once.

Table 3: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for malaria treatment/antimalarials

Variable	Malaria Treatment		Test Statistic (χ^2)	p-value
	Utilised (n=507) n(%)	Not utilised (n=43) n(%)		
Age (Years)				
≤24	246(94.3)	15(5.7)	*3.433	0.302
25-44	194(89.8)	22(10.2)		
45-59	52 (91.2)	5 (8.8)		
≥ 60	8 (50.0)	8 (50.0)		
Sex				
Male	232 (94.3)	14 (5.7)	2.794	0.111
Female	275 (90.5)	29 (9.5)		
Tribe				
Edo-indigenes	306 (90.8)	31 (9.2)	2.302	0.144
Non-Edo-indigenes	201 (94.4)	12 (5.6)		
Marital Status				
Never-married	362 (91.2)	35 (8.8)	1.972	0.214
Ever-married	145 (94.8)	8 (5.2)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	*0.267	0.901
Middle	279 (92.4)	23 (7.6)		
High	225 (91.8)	20 (8.2)		

*=Fisher's Exact

The table shows that none of the socio-demographic variables examined (age, sex, tribe, marital status, and socioeconomic status) were significantly associated with the utilisation of malaria treatment, as all p-values were greater than 0.05. Although utilisation was generally high across all groups, it was slightly higher among respondents aged ≤24 years (94.3%) and males (94.3%) compared to females (90.5%), but these differences were not statistically significant (p = 0.302 and p = 0.111, respectively). Similarly, non-Edo indigenes (94.4%) had higher utilisation than Edo indigenes (90.8%), and ever-married individuals (94.8%) slightly exceeded never-married respondents (91.2%), though these variations were not significant. Utilisation was also consistently high across socioeconomic groups, with minimal differences (p = 0.901). Overall, malaria treatment utilisation was uniformly high and not influenced by the socio-demographic factors assessed.

Table 4: Predictors of utilisation of patent medicine stores for malaria treatment by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.037	0.963	0.930	0.998	**0.039**
Sex					
Male	0.575	1.777	0.911	3.465	0.092
Female*		1			
Tribe					
Edo-indigenes	-0.605	0.546	0.272	1.095	0.088
Non-Edo-indigenes		1			
Marital Status					
Never-married	-1.287	0.276	0.097	0.789	**0.016**
Ever-married*		1			
Socioeconomic status					
Low	18.721	135062417.3	0.000	-	0.999
Middle	0.034	1.034	0.508	2.106	0.926
High*		1			

*=Reference Category, R Square = 1.8 -4.3%

The logistic regression model indicates that age and marital status were the only significant predictors of utilisation of patent medicine stores for malaria treatment, while sex, tribe, and socioeconomic status were not significant. Increasing age was associated with a slight but statistically significant reduction in utilisation (OR = 0.963, 95% CI: 0.930–0.998, p = 0.039). Never-married respondents were significantly less likely to utilise patent medicine stores compared to ever-married respondents (OR = 0.276, 95% CI: 0.097–0.789, p = 0.016). Although males had higher odds of utilisation than females (OR = 1.777), this was not statistically significant (p = 0.092). Similarly, Edo indigenes had lower odds compared to non-Edo indigenes (OR = 0.546), but this difference was not significant (p = 0.088). Socioeconomic status did not significantly influence utilisation. Overall, the model suggests that being older and never-married reduces the likelihood of using patent medicine stores for malaria treatment, while other factors showed no independent effect.

Table 5: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of Fever (general) symptoms

Variable	Fever Treatment		Test Statistic (χ^2)	p-value
	Utilised (n=441) n(%)	Not utilised (n=109) n(%)		
Age (Years)				
≤24	208 (79.7)	53 (20.3)	0.079	0.994
25-44	174 (80.6)	42 (19.4)		
45-59	46 (80.7)	11(19.3)		
≥ 60	13 (81.3)	3 (18.8)		
Sex				
Male	196 (79.7)	50 (20.3)	0.072	0.830
Female	245 (80.6)	59 (19.4)		
Tribe				
Edo-indigenes	268 (79.5)	69 (20.5)	0.236	0.662
Non-Edo-indigenes	173 (81.2)	40 (18.8)		
Marital Status				
Never-married	362 (91.2)	35 (8.8)	1.972	0.214
Ever-married	145 (94.8)	8 (5.2)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	*3.064	0.207
Middle	234 (77.5)	68 (22.5)		
High	204 (83.3)	41 (16.7)		

*=Fisher's Exact

The table indicates that there is no statistically significant association between any of the socio-demographic variables (age, sex, tribe, marital status, and socioeconomic status) and the utilisation of fever treatment, as all p-values are greater than 0.05. Utilisation rates were fairly consistent across all age groups, ranging from 79.7% to 81.3% (p = 0.994), and were also similar between males (79.7%) and females (80.6%) (p = 0.830). Slight differences were observed between non-Edo indigenes (81.2%) and Edo indigenes (79.5%) (p = 0.662), and across socioeconomic groups, with higher utilisation among high SES respondents (83.3%) compared to middle SES (77.5%), but these were not statistically significant (p = 0.207). Overall, fever treatment utilisation was relatively uniform and not influenced by the socio-demographic characteristics studied..

Table 6: Predictors of utilisation of patent medicine stores for Fever treatment by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.027	0.973	0.948	0.999	**0.044**
Sex					
Male	-0.005	0.995	0.650	1.525	0.983
Female*		1			
Tribe					
Edo-indigenes	-0.166	0.847	0.546	1.314	0.458
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.763	0.466	0.230	0.946	**0.035**
Ever-married*		1			
Socioeconomic status					
Low	19.537	305224108.6	0.000	-	0.999
Middle	-0.401	0.670	0.408	1.100	0.113
High*		1			

*=Reference Category, R Square = 1.7 -2.7%

The logistic regression analysis shows that age and marital status were significant predictors of utilisation of patent medicine stores for fever treatment, while sex, tribe, and socioeconomic status were not. Increasing age was associated with a slight but significant reduction in utilisation (OR = 0.973, 95% CI: 0.948–0.999, p = 0.044). Never-married respondents were significantly less likely to utilise patent medicine stores compared to ever-married respondents (OR = 0.466, 95% CI: 0.230–0.946, p = 0.035). Although males had slightly lower odds of utilisation than females (OR = 0.995), this difference was not significant (p = 0.983). Similarly, Edo indigenes had lower odds compared to non-indigenes (OR = 0.847), but this was not statistically significant (p = 0.458). Socioeconomic status also did not significantly predict utilisation. Overall, older age and being never-married reduced the likelihood of using patent medicine stores for fever treatment, while other factors showed no independent effect.

Table 7: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of Cough/cold or respiratory symptoms

Variable	Cough Treatment		Test Statistic (χ^2)	p-value
	Utilised (n=424) n(%)	Not utilised (n=126) n(%)		
Age (Years)				
≤24	212 (81.2)	49 (18.8)	6.534	0.087
25-44	162 (80.)	54 (25.0)		
45-59	40 (70.2)	17(29.8)		
≥ 60	13 (81.3)	3 (18.8)		
Sex				
Male	184 (74.8)	62 (25.2)	1.326	0.263
Female	240 (78.9)	64 (21.1)		
Tribe				
Edo-indigenes	264 (78.3)	73 (21.7)	0.767	0.405
Non-Edo-indigenes	160 (75.1)	53 (24.9)		
Marital Status				
Never-married	362 (91.2)	35 (8.8)	1.972	0.214
Ever-married	145 (94.8)	8 (5.2)		
Socioeconomic status				
Low	2 (66.7)	1 (33.3)	*0.763	0.660
Middle	235 (77.8)	67 (22.2)		
High	187 (76.3)	58 (23.7)		

*=Fisher's Exact

The table shows that none of the socio-demographic variables (age, sex, tribe, marital status, and socioeconomic status) were significantly associated with the utilisation of cough treatment, as all p-values were greater than 0.05. Although utilisation appeared slightly lower among respondents aged 45–59 years (70.2%) compared to other age groups, this difference was not statistically significant (p = 0.087). Females (78.9%) had higher utilisation than males (74.8%), and Edo indigenes (78.3%) slightly exceeded non-Edo indigenes (75.1%), but these differences were also not significant (p = 0.263 and p = 0.405, respectively). Utilisation rates were similar across socioeconomic groups and marital status categories, with no meaningful statistical differences. Overall, cough treatment utilisation was relatively consistent and not influenced by the socio-demographic factors assessed.

Table 8: Predictors of utilisation of patent medicine stores for Cough treatment by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.027	0.973	0.950	0.997	**0.025**
Sex					
Male	-0.211	0.809	0.540	1.525	0.305
Female*		1			
Tribe					
Edo-indigenes	0.242	1.274	0.844	1.922	0.249
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.002	0.998	0.542	1.213	0.995
Ever-married*		1			
Socioeconomic status					
Low	-6.72	0.511	0.000	-	0.588
Middle	-0.210	0.810	0.507	1.296	0.381
High*		1			

*=Reference Category, R Square = 1.8 -2.7%

The logistic regression analysis indicates that age was the only significant predictor of utilisation of patent medicine stores for cough treatment, while sex, tribe, marital status, and socioeconomic status were not significant. Increasing age was associated with a slight but significant reduction in utilisation (OR = 0.973, 95% CI: 0.950–0.997, p = 0.025). Males had lower odds of utilisation compared to females (OR = 0.809), but this was not statistically significant (p = 0.305). Edo indigenes had slightly higher odds than non-indigenes (OR = 1.274), but this difference was not significant (p = 0.249). Similarly, never-married respondents showed no meaningful difference in utilisation compared to ever-married individuals (p = 0.995), and socioeconomic status was also not a significant predictor. Overall, only increasing age was associated with reduced likelihood of using patent medicine stores for cough treatment, while other factors showed no independent effect.

Table 9: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of diarrhoea

Variable	Diarrhoea treatment		Test Statistic (χ^2)	p-value
	Utilised (n=246) n(%)	Not utilised(n=304) n(%)		
Age (Years)				
≤24	98 (37.5)	163 (62.5)	15.202	**0.001**
25-44	118 (54.6)	98 (45.4)		
45-59	25 (43.9)	32(56.1)		
≥ 60	5 (31.3)	11 (68.8)		
Sex				
Male	93 (37.8)	153 (62.2)	8.627	**0.003**
Female	153 (50.3)	151 (49.7)		
Tribe				
Edo-indigenes	148 (43.9)	189 (56.1)	0.231	0.660
Non-Edo-indigenes	98 (46.0)	115 (54.0)		
Marital Status				
Never-married	168 (42.3)	229 (57.7)	3.353	0.070
Ever-married	78 (51.0)	75 (49.0)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	*13.165	**<0.001**
Middle	116 (38.4)	186 (61.6)		
High	127 (51.8)	118 (48.2)		

*=Fisher's Exact

The table shows that age, sex, and socioeconomic status were significantly associated with the utilisation of diarrhoea treatment, while tribe and marital status were not. Utilisation was highest among respondents aged 25–44 years (54.6%) and lowest among those ≥60 years (31.3%), with a significant association (χ^2 = 15.202, p = 0.001). Females (50.3%) had a significantly higher utilisation rate than males (37.8%) (χ^2 = 8.627, p = 0.003). Although non-Edo indigenes (46.0%) had slightly higher utilisation than Edo indigenes (43.9%), this was not statistically significant (p = 0.660). Similarly, ever-married respondents (51.0%) showed higher utilisation than never-married (42.3%), but this was not significant (p = 0.070). Utilisation increased with socioeconomic status, with the highest among high SES respondents (51.8%), and this association was statistically significant (χ^2 = 13.165, p < 0.001), although the very small number in the low SES group may limit interpretation.

Table 10: Predictors of utilisation of patent medicine stores for Diarrhoea treatment by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.014	0.986	0.965	1.008	0.219
Sex					
Male	-0.460	0.631	0.446	0.894	**0.010**
Female*		1			
Tribe					
Edo-indigenes	-0.135	0.874	0.616	1.240	0.451
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.340	0.712	0.542	0.712	0.417
Ever-married*		1			
Socioeconomic status					
Low	21.084	143509749	0.000	-	0.999
Middle	-0.539	0.583	0.391	0.869	**0.008**
High*		1			

*=Reference Category, R Square = 4.2 -5.7%

The logistic regression analysis shows that sex and socioeconomic status were significant predictors of utilisation of patent medicine stores for diarrhoea treatment, while age, tribe, and marital status were not. Males were significantly less likely to utilise patent medicine stores compared to females (OR = 0.631, 95% CI: 0.446–0.894, p = 0.010). Respondents in the middle socioeconomic class also had significantly lower odds of utilisation compared to those in the high SES group (OR = 0.583, 95% CI: 0.391–0.869, p = 0.008). Although age showed a slight negative association with utilisation (OR = 0.986), this was not statistically significant (p = 0.219). Similarly, tribe and marital status did not significantly predict utilisation. Overall, female sex and higher socioeconomic status were associated with greater use of patent medicine stores for diarrhoea treatment, while other factors had no independent effect.

Table 11: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of Headache/ Pain relief

Variable	Headache Treatment		Test Statistic (χ^2)	p-value
	Utilised (n=463) n(%)	Not utilised(n=87) n(%)		
Age (Years)				
≤24	220 (84.3)	41 (15.7)	0.758	0.867
25-44	180 (83.3)	36 (16.7)		
45-59	50 (87.7)	7 (12.3)		
≥ 60	13 (81.3)	3 (18.8)		
Sex				
Male	201 (81.7)	45 (18.3)	2.047	0.160
Female	262 (86.2)	42 (13.8)		
Tribe				
Edo-indigenes	283 (84.0)	54 (16.0)	0.028	0.905
Non-Edo-indigenes	180 (84.5)	33 (15.5)		
Marital Status				
Never-married	325 (81.9)	72 (18.1)	5.758	**0.018**
Ever-married	138 (90.2)	15 (9.8)		
Socioeconomic status				
Low	2 (66.7)	1 (33.3)	*2.378	0.258
Middle	250 (82.8)	52 (17.2)		
High	211 (86.1)	34 (13.9)		

*=Fisher's Exact

The table shows that only marital status was significantly associated with the utilisation of headache treatment, while age, sex, tribe, and socioeconomic status were not. Utilisation rates were similar across age groups, ranging from 81.3% to 87.7% (p = 0.867), and slightly higher among females (86.2%) compared to males (81.7%), though this was not statistically significant (p = 0.160). There was virtually no difference between Edo indigenes (84.0%) and non-Edo indigenes (84.5%) (p = 0.905). However, ever-married respondents had a significantly higher utilisation rate (90.2%) compared to never-married individuals (81.9%) (χ^2 = 5.758, p = 0.018). Although utilisation appeared higher among respondents with high socioeconomic status (86.1%) compared to middle (82.8%) and low (66.7%) groups, this difference was not statistically significant (p = 0.258). Overall, marital status was the only factor influencing headache treatment utilisation.

Table 12: Predictors of utilisation of patent medicine stores for Headache treatment by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.034	0.966	0.939	0.995	**0.020**
Sex					
Male	-0.311	0.732	0.460	1.167	0.191
Female*		1			
Tribe					
Edo-indigenes	-0.125	0.882	0.547	1.422	0.607
Non-Edo-indigenes		1			
Marital Status					
Never-married	-1.286	0.276	0.121	0.629	**0.002**
Ever-married*		1			
Socioeconomic status					
Low	-1.223	0.294	0.025	3.492	0.333
Middle	-0.184	0.832	0.486	1.423	0.501
High*		1			

*=Reference Category, R Square = 2.5 -4.3%

The logistic regression analysis indicates that age and marital status were significant predictors of utilisation of patent medicine stores for headache treatment, while sex, tribe, and socioeconomic status were not significant. Increasing age was associated with a slight but significant reduction in utilisation (OR = 0.966, 95% CI: 0.939–0.995, p = 0.020). Never-married respondents were also significantly less likely to utilise patent medicine stores compared to ever-married respondents (OR = 0.276, 95% CI: 0.121–0.629, p = 0.002). Although males had lower odds of utilisation than females (OR = 0.732), this difference was not statistically significant (p = 0.191). Similarly, Edo indigenes had slightly lower odds than non-indigenes (OR = 0.882), but this was not significant (p = 0.607). Socioeconomic status did not significantly influence utilisation. Overall, older age and being never-married were associated with reduced likelihood of using patent medicine stores for headache treatment, while other factors showed no independent effect.

Table 13: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for family planning products

Variable	Family planning products		Test Statistic (χ^2)	p-value
	Utilised (n=111) n(%)	Not utilised(n=439) n(%)		
Age (Years)				
≤24	29 (11.1)	232 (88.9)	38.753	**<0.001**
25-44	72 (33.3)	144 (66.7)		
45-59	7 (12.3)	50 (87.7)		
≥ 60	3 (18.8)	13 (81.3)		
Sex				
Male	48 (19.5)	198 (80.5)	0.124	0.749
Female	63 (20.7)	241 (79.3)		
Tribe				
Edo-indigenes	69 (20.5)	268 (79.5)	0.046	0.913
Non-Edo-indigenes	42 (19.7)	171 (80.3)		
Marital Status				
Never-married	60 (15.1)	337 (84.9)	22.759	**<0.001**
Ever-married	51 (33.3)	102 (66.7)		
Socioeconomic status				
Low	2 (66.7)	1 (33.3)	*12.795	**<0.001**
Middle	46 (15.2)	256 (84.8)		
High	63 (25.7)	182 (74.3)		

*=Fisher's Exact

The table shows that age, marital status, and socioeconomic status were significantly associated with the utilisation of family planning products, while sex and tribe were not. Utilisation was highest among respondents aged 25–44 years (33.3%) and lowest among those ≤24 years (11.1%), with a strong significant association ($\chi^2 = 38.753$, $p < 0.001$). Ever-married individuals had significantly higher utilisation (33.3%) compared to never-married respondents (15.1%) ($\chi^2 = 22.759$, $p < 0.001$). Utilisation also increased with socioeconomic status, being highest among high SES respondents (25.7%) compared to middle SES (15.2%), and this association was statistically significant ($\chi^2 = 12.795$, $p < 0.001$), though the low SES group had very few participants. There was little difference between males (19.5%) and females (20.7%) ($p = 0.749$), and between Edo indigenes (20.5%) and non-indigenes (19.7%) ($p = 0.913$).

Table 14: Predictors of utilisation of patent medicine stores for family planning products by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.032	0.969	0.942	0.996	**0.026**
Sex					
Male	0.020	1.021	0.659	1.580	0.927
Female*		1			
Tribe					
Edo-indigenes	-0.111	0.895	0.574	1.395	0.623
Non-Edo-indigenes		1			
Marital Status					
Never-married	-1.374	0.253	0.134	0.477	**<0.001**
Ever-married*		1			
Socioeconomic status					
Low	1.883	6.576	0.560	77.205	0.134
Middle	-0.457	0.633	0.383	1.047	0.075
High*		1			

*=Reference Category, R Square = 5.5 -8.7%

The logistic regression analysis shows that age and marital status were the only significant predictors of utilisation of patent medicine stores for family planning products, while sex, tribe, and socioeconomic status were not significant. Increasing age was associated with a slight but significant reduction in utilisation (OR = 0.969, 95% CI: 0.942–0.996, p = 0.026). Never-married respondents were significantly less likely to utilise patent medicine stores for family planning products compared to ever-married respondents (OR = 0.253, 95% CI: 0.134–0.477, p < 0.001). Although males had slightly higher odds of utilisation than females (OR = 1.021), this was not statistically significant (p = 0.927). Similarly, Edo indigenes had lower odds than non-indigenes (OR = 0.895), but this difference was not significant (p = 0.623). Socioeconomic status also did not significantly predict utilisation, although the middle SES group showed a borderline reduction in odds (p = 0.075). Overall, younger age and being ever-married were associated with higher utilisation of patent medicine stores for family planning products, while other variables showed no independent effect.

Table 15: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for Reproductive health advice

Variable	Reproductive health advice		Test Statistic (χ^2)	p-value
	Utilised(n=111) n(%)	Not utilised(n=439) n(%)		
Age (Years)				
≤24	37 (14.2)	224 (85.8)	16.285	**0.001**
25-44	62 (28.7)	154 (71.3)		
45-59	9 (15.8)	48 (84.2)		
≥ 60	3 (18.8)	13 (81.3)		
Sex				
Male	40 (16.3)	206 (83.7)	4.249	**0.043**
Female	71 (23.4)	233 (76.6)		
Tribe				
Edo-indigenes	71 (21.1)	266 (78.9)	0.424	0.586
Non-Edo-indigenes	40 (18.8)	173 (81.2)		
Marital Status				
Never-married	60 (15.1)	337 (84.9)	22.759	**<0.001**
Ever-married	51 (33.3)	102 (66.7)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*8.262	**0.016**
Middle	48 (15.9)	254 (84.1)		
High	63 (25.7)	182 (74.3)		

*=Fisher's Exact

The table shows that age, sex, marital status, and socioeconomic status were significantly associated with the utilisation of reproductive health advice, while tribe was not. Utilisation was highest among respondents aged 25–44 years (28.7%) and lowest among those ≤24 years (14.2%), with a significant association ($\chi^2 = 16.285$, $p = 0.001$). Females (23.4%) were significantly more likely to utilise reproductive health advice than males (16.3%) ($\chi^2 = 4.249$, $p = 0.043$). Ever-married individuals had markedly higher utilisation (33.3%) compared to never-married respondents (15.1%) ($\chi^2 = 22.759$, $p < 0.001$). Utilisation also increased with socioeconomic status, being highest among high SES respondents (25.7%) and lowest among low SES (0.0%), with a significant association ($\chi^2 = 8.262$, $p = 0.016$), though the low SES group was very small. There was no significant difference as regards to tribe.

Table 16: Predictors of utilisation of patent medicine stores for Reproductive health advice by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.020	0.980	0.954	1.007	0.144
Sex					
Male	-0.402	0.669	0.431	1.039	0.074
Female*		1			
Tribe					
Edo-indigenes	0.024	1.024	0.658	1.595	0.916
Non-Edo-indigenes		1			
Marital Status					
Never-married	0.998	0.369	0.198	0.687	**0.002**
Ever-married*		1			
Socioeconomic status					
Low	-20.145	0.000	0.000	-	0.999
Middle	-0.401	0.670	0.408	1.099	0.113
High*		1			

*=Reference Category, R Square = 4.1 -6.5%

The logistic regression analysis shows that marital status was the only statistically significant predictor of utilisation of patent medicine stores for reproductive health advice services, while age, sex, tribe, and socioeconomic status were not significant. Never-married respondents were significantly less likely to use patent medicine stores for reproductive health advice compared to ever-married respondents (OR = 0.369, 95% CI: 0.198–0.687, p = 0.002), indicating that married individuals were more likely to seek reproductive health advice from patent medicine stores. Age showed a slight decrease in the likelihood of using patent medicine stores for reproductive health advice with increasing age (OR = 0.980), but this was not statistically significant (p = 0.144), meaning age did not meaningfully influence where respondents obtained reproductive health advice. Males had lower odds of using patent medicine stores for reproductive health advice compared to females (OR = 0.669), but this was not statistically significant (p = 0.074), so sex did not independently affect where advice was sought. Tribe also had no effect on the use of patent medicine stores for reproductive

health advice, as Edo indigenes and non-indigenes showed similar patterns of use (OR = 1.024, p = 0.916), indicating no ethnic influence. Socioeconomic status did not significantly determine use of patent medicine stores for reproductive health advice, although respondents in the middle SES group had lower odds compared to those in the high SES group (OR = 0.670, p = 0.113), showing that economic status did not meaningfully affect where reproductive health advice was obtained.

Table 17: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of STIs

Variable	Treatment of STIs		Test Statistic (χ^2)	p-value
	Utilised (n=63) n(%)	Not utilised (n=487) n(%)		
Age (Years)				
≤24	15 (5.7)	246 (94.3)	25.771	**<0.001**
25-44	43 (19.9)	173 (80.1)		
45-59	3 (5.3)	54 (94.7)		
≥ 60	2 (12.5)	14 (87.5)		
Sex				
Male	24 (9.8)	222 (90.2)	1.266	0.283
Female	39 (12.8	265 (87.2)		
Tribe				
Edo-indigenes	40 (11.9)	297 (88.1)	0.148	0.784
Non-Edo-indigenes	23 (10.8)	190 (89.2)		
Marital Status				
Never-married	60 (15.1)	337 (84.9)	22.759	**<0.001**
Ever-married	51 (33.3)	102 (66.7)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*6.970	**0.026**
Middle	25 (8.3)	277 (91.7)		
High	38 (15.5)	207 (84.5)		

*=Fisher's Exact

The table shows that age, marital status, and socioeconomic status were significantly associated with the utilisation of treatment for STIs, while sex and tribe were not. Utilisation was highest among respondents aged 25–44 years (19.9%) and lowest among those ≤24 years (5.7%), with a significant association ($\chi^2 = 25.771$, $p < 0.001$). Ever-married individuals had substantially higher utilisation compared to never-married respondents, and this difference was statistically significant ($p < 0.001$). Utilisation also increased with socioeconomic status, with higher rates among high SES respondents (15.5%) compared to middle SES (8.3%) and none among low SES, and this association was significant ($\chi^2 = 6.970$, $p = 0.026$), although the low SES group was very small. There were no significant differences by sex ($p = 0.283$) or tribe ($p = 0.784$). Overall, utilisation of STI treatment was low and mainly influenced by age, marital status, and socioeconomic status.

Table 18: Predictors of utilisation of patent medicine stores for treatment of STIs by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.020	0.980	0.948	1.013	0.238
Sex					
Male	-0.237	0.789	0.456	1.366	0.398
Female*		1			
Tribe					
Edo-indigenes	-0.007	0.993	0.570	1.731	0.981
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.843	0.430	0.202	0.918	**0.029**
Ever-married*		1			
Socioeconomic status					
Low	-19.498	0.000	0.000	-	0.999
Middle	-0.573	0.564	0.302	1.052	0.072
High*		1			

*=Reference Category, R Square = 2.4 -4.7%

The logistic regression analysis shows that marital status was the only statistically significant predictor of utilisation of patent medicine stores for treatment of skin problems, while age, sex, tribe, and socioeconomic status were not significant. Never-married respondents were significantly less likely to use patent medicine stores for treatment of skin problems compared to ever-married respondents (OR = 0.430, 95% CI: 0.202–0.918, p = 0.029), indicating higher utilisation among married individuals for managing skin-related conditions. Age showed a slight negative association with utilisation (OR = 0.980), but this was not statistically significant (p = 0.238), meaning age did not meaningfully influence where skin problems were treated. Males had lower odds of using patent medicine stores for treatment of skin problems compared to females (OR = 0.789), but this was not statistically significant (p = 0.398), so sex did not independently affect utilisation. Tribe also did not predict utilisation, as Edo indigenes and non-indigenes had nearly identical odds of use (OR = 0.993, p = 0.981), indicating no ethnic influence. Socioeconomic status was also not a significant determinant of

utilisation, although respondents in the middle SES group had lower odds compared to those in the high SES group (OR = 0.564, p = 0.072), showing that economic status did not significantly affect where skin problems were managed

Table 19: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for treatment of Skin problems

Variable	Treatment of Skin Problems		Test Statistic (χ^2)	p-value
	Utilised (n=228) n(%)	Not utilized (n=322) n(%)		
Age (Years)				
≤24	99 (37.9)	162 (62.1)	4.198	0.240
25-44	96 (44.4)	120 (55.6)		
45-59	28 (49.1)	29 (50.9)		
≥ 60	5 (12.5)	11 (68.8)		
Sex				
Male	93 (37.8)	153 (62.2)	2.443	1.139
Female	135 (44.4)	169 (55.6)		
Tribe				
Edo-indigenes	137 (40.7)	200 (59.3)	0.230	0.657
Non-Edo-indigenes	91 (42.7)	122 (57.3)		
Marital Status				
Never-married	152 (38.3)	245 (61.7)	5.899	**0.016**
Ever-married	76 (49.7)	77 (50.3)		
Socioeconomic status				
Low	1 (33.3)	2 (66.7)	3.331	0.192
Middle	115 (38.1)	187 (61.9)		
High	112 (15.5)	133 (54.3)		

The table shows that only marital status was significantly associated with the utilisation of treatment for skin problems, while age, sex, tribe, and socioeconomic status were not. Utilisation rates varied across age groups (12.5%–49.1%), but this was not statistically significant ($p = 0.240$). Females (44.4%) had slightly higher utilisation than males (37.8%), but this difference was not significant, and similarly, there was no meaningful difference between Edo indigenes (40.7%) and non-indigenes (42.7%) ($p = 0.657$). Although utilisation appeared higher among high socioeconomic status respondents, the association was not statistically significant ($p = 0.192$). However, ever-married respondents had significantly higher utilisation (49.7%) compared to never-married individuals (38.3%) ($\chi^2 = 5.899$, $p = 0.016$). Overall, skin problem treatment utilisation was moderately distributed and influenced only by marital status.

Table 20: Predictors of utilisation of patent medicine stores for treatment of Skin problems by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.019	0.982	0.948	1.004	0.102
Sex					
Male	-0.237	0.789	0.557	1.117	0.181
Female*		1			
Tribe					
Edo-indigenes	-0.152	0.859	0.603	1.223	0.399
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.676	0.508	0.297	0.869	**0.013**
Ever-married*		1			
Socioeconomic status					
Low	-0.545	0.580	0.051	6.588	0.660
Middle	-0.245	0.783	0.525	1.167	0.229
High*		1			

*=Reference Category, R Square = 2.1- 2.8%

The logistic regression analysis shows that marital status was the only statistically significant predictor of utilisation of patent medicine stores for referral to a clinic, while age, sex, tribe, and socioeconomic status were not significant. Never-married respondents were significantly less likely to use patent medicine stores for referral to a clinic compared to ever-married respondents (OR = 0.508, 95% CI: 0.297–0.869, p = 0.013), indicating that married individuals were more likely to be referred to a clinic through patent medicine stores. Age showed a slight decrease in the likelihood of being referred to a clinic with increasing age (OR = 0.982), but this was not statistically significant (p = 0.102), so age did not meaningfully influence referral patterns. Males had lower odds of using patent medicine stores for referral compared to females (OR = 0.789), but this was not statistically significant (p = 0.181), indicating no sex-based difference in referral behavior. Tribe also did not influence referral to a clinic, as Edo indigenes and non-indigenes showed similar odds of utilisation (OR = 0.859, p = 0.399), meaning ethnicity had no effect. Socioeconomic status

was also not a significant determinant of referral, as both low and middle SES groups did not differ significantly from the high SES group ($p = 0.660$ and $p = 0.229$ respectively), showing that economic status did not affect referral behavior.

Table 21: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for Referral to a clinic/health facility

Variable	Referral Services		Test Statistic (χ^2)	p-value
	Utilised (n=231) n(%)	Not utilized (n=319) n(%)		
Age (Years)				
≤24	109 (41.8)	152 (58.2)	0.831	0.835
25-44	92 (42.6)	124 (57.4)		
45-59	25 (43.9)	32 (56.1)		
≥ 60	5 (12.5)	11 (68.8)		
Sex				
Male	102 (41.5)	175 (57.6)	0.053	0.862
Female	175 (57.6)	129 (42.4)		
Tribe				
Edo-indigenes	140 (41.5)	197 (58.5)	0.075	0.791
Non-Edo-indigenes	91 (42.7)	122 (57.3)		
Marital Status				
Never-married	152 (38.3)	245 (61.7)	5.899	**0.016**
Ever-married	76 (49.7)	77 (50.3)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*3.964	0.116
Middle	119 (39.4)	183 (60.6)		
High	112(45.7)	133 (54.3)		

*=Fisher's Exact

The table shows that marital status was the only factor significantly associated with referral to a clinic, while age, sex, tribe, and socioeconomic status were not. Utilisation of referral services was fairly similar across age groups (41.8%–43.9%) with no significant association ($p = 0.835$). Although females showed higher referral utilisation (57.6%) compared to males (41.5%), this difference was not statistically significant ($p = 0.862$). There was also no significant difference between Edo indigenes (41.5%) and non-Edo indigenes (42.7%) ($p = 0.791$). Referral increased slightly with socioeconomic status, but this was not significant ($p = 0.116$). However, ever-married respondents had significantly higher utilisation (49.7%) compared to never-married individuals (38.3%) ($\chi^2 = 5.899$, $p = 0.016$). Overall, referral to a clinic was moderate and mainly influenced by marital status.

Table 22: Predictors of utilisation of patent medicine stores for Referral to a clinic/health facility by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.022	0.978	0.957	1.000	0.055
Sex					
Male	-0.002	0.998	0.706	1.411	0.992
Female*		1			
Tribe					
Edo-indigenes	-0.099	0.906	0.637	1.288	0.582
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.628	0.534	0.312	0.913	**0.022**
Ever-married*		1			
Socioeconomic status					
Low	-21.062	0.000	0.000	-	0.999
Middle	-0.264	0.768	0.516	1.144	0.194
High*		1			

*=Reference Category, R Square = 2.0- 2.7%

The logistic regression analysis shows that marital status was the only statistically significant predictor of utilisation of patent medicine stores for vaccination advice, while age, sex, tribe, and socioeconomic status were not significant. Never-married respondents were significantly less likely to use patent medicine stores for vaccination advice compared to ever-married respondents (OR = 0.534, 95% CI: 0.312–0.913, p = 0.022), indicating higher utilisation among married individuals. Age showed a borderline negative association with utilisation (OR = 0.978), but this was not statistically significant (p = 0.055), meaning age did not significantly influence where vaccination advice was obtained. Males had almost identical odds of utilisation compared to females (OR = 0.998), and this was not statistically significant (p = 0.992), showing no sex-based difference in utilisation. Tribe also did not predict utilisation, as Edo indigenes and non-indigenes had similar odds (OR = 0.906, p = 0.582), indicating no ethnic influence. Socioeconomic status was also not a significant

determinant, as neither the middle SES group nor the low SES group differed significantly from the high SES group.

Table 23: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for Vaccination advice

Variable	Vaccination advice		Test Statistic (χ^2)	p-value
	Utilised (n=153) n(%)	Not utilised (n=397) n(%)		
Age (Years)				
≤24	59 (22.6)	202 (77.4)	9.043	**0.028**
25-44	74 (34.3)	142 (65.7)		
45-59	14 (24.6)	43 (75.4)		
≥ 60	6 (37.5)	10 (62.5)		
Sex				
Male	70 (28.5)	176 (71.5)	0.090	0.775
Female	83 (27.3)	221 (72.7)		
Tribe				
Edo-indigenes	91 (27.0)	246 (73.0)	0.288	0.626
Non-Edo-indigenes	62 (29.1)	151 (70.9)		
Marital Status				
Never-married	92 (23.2)	305 (76.8)	15.331	**<0.001**
Ever-married	61 (39.9)	92 (60.1)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*8.282	**0.010**
Middle	70 (23.2)	162 (66.1)		
High	83 (33.9)	162 (66.1)		

*=Fisher's Exact

The table shows that age, marital status, and socioeconomic status were significantly associated with the utilisation of vaccination advice, while sex and tribe were not. Utilisation was highest among respondents aged 25–44 years (34.3%) and lowest among those ≤24 years (22.6%), with a significant association ($\chi^2 = 9.043$, $p = 0.028$). Ever-married individuals had significantly higher utilisation (39.9%) compared to never-married respondents (23.2%) ($\chi^2 = 15.331$, $p < 0.001$). Utilisation also increased with socioeconomic status, being highest among high SES respondents (33.9%) and lowest among low SES (0.0%), with a significant association ($\chi^2 = 8.282$, $p = 0.010$), although the low SES group was very small. There were no significant differences by sex ($p = 0.775$) or tribe ($p = 0.626$). Overall, utilisation of vaccination advice was moderate and mainly influenced by age, marital status, and socioeconomic status.

Table 24: Predictors of utilisation of patent medicine stores for Vaccination advice by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.023	0.977	0.954	1.002	0.067
Sex					
Male	0.124	1.132	0.769	1.664	0.530
Female*		1			
Tribe					
Edo-indigenes	-0.227	0.797	0.538	1.180	0.257
Non-Edo-indigenes		1			
Marital Status					
Never-married	-1.013	0.363	0.204	0.646	**<0.001**
Ever-married*		1			
Socioeconomic status					
Low	-20.502	0.000	0.000	-	0.999
Middle	-0.402	0.669	0.430	1.040	0.074
High*		1			

*=Reference Category, R Square = 3.9- 5.7%

The logistic regression analysis shows that marital status was the only statistically significant predictor of utilisation of patent medicine stores for vaccination advice services, while age, sex, tribe, and socioeconomic status were not significant predictors. Never-married respondents were significantly less likely to utilise patent medicine stores for vaccination advice compared to ever-married respondents (OR = 0.363, 95% CI: 0.204–0.646, $p < 0.001$), indicating higher utilisation among married individuals. Age showed a slight reduction in the likelihood of utilisation with increasing age (OR = 0.977), but this was not statistically significant ($p = 0.067$), meaning age did not meaningfully influence utilisation. Males had slightly higher odds of utilisation compared to females (OR = 1.132), but this difference was not statistically significant ($p = 0.530$), so sex did not affect utilisation patterns. Similarly, Edo indigenes had lower odds than non-indigenes (OR = 0.797), but this was not statistically significant ($p = 0.257$), indicating no ethnic influence on utilisation. Socioeconomic status also did not significantly predict utilisation, although respondents in the middle SES group

showed a non-significant reduction in odds compared to those in the high SES group (OR = 0.669, p = 0.074), showing that economic status did not meaningfully affect where vaccination advice was obtained.

Table 25: Socio-demographic characteristics of respondents and level of utilisation of patent medicine stores/vendors for Nutrition

Variable	Nutrition services		Test Statistic (χ^2)	p-value
	Utilised (n=313) n(%)	Not utilised (n=237) n(%)		
Age (Years)				
≤24	139 (53.3)	122 (46.7)	7.120	0.068
25-44	136 (63.0)	80 (37.0)		
45-59	32 (56.1)	25 (43.9)		
≥ 60	6 (37.5)	10 (62.5)		
Sex				
Male	129 (52.4)	117 (47.6)	3.626	0.069
Female	184 (60.5)	120 (39.5)		
Tribe				
Edo-indigenes	185 (54.9)	152 (45.1)	1.438	0.251
Non-Edo-indigenes	128 (60.1)	85 (39.9)		
Marital Status				
Never-married	219 (55.2)	178 (44.8)	1.773	0.212
Ever-married	94 (61.4)	59 (38.6)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*16.658	**<0.001**
Middle	152 (50.3)	150 (49.7)		
High	161 (65.7)	84 (34.3)		

*=Fisher's Exact

The table shows that only socioeconomic status was significantly associated with utilisation of nutrition services, while age, sex, tribe, and marital status were not. Utilisation was highest among respondents aged 25–44 years (63.0%) and lowest among those ≥60 years (37.5%), but this was not statistically significant (p = 0.068). Females (60.5%) had higher utilisation than males (52.4%), though this difference was also not significant (p = 0.069). There were no significant differences by tribe (p = 0.251) or marital status (p = 0.212). However, utilisation increased markedly with socioeconomic status, being highest among high SES respondents (65.7%) and lowest among low SES (0.0%), and this association was statistically significant ($\chi^2 = 16.658$, $p < 0.001$), although interpretation is limited by the very small low SES group. Overall, nutrition service utilisation was moderate and mainly influenced by socioeconomic status.

Table 26: Predictors of utilisation of patent medicine stores for Nutrition by respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.023	0.977	0.956	0.999	0.044
Sex					
Male	-0.268	0.765	0.540	1.082	0.130
Female*		1			
Tribe					
Edo-indigenes	-0.253	0.777	0.546	1.105	0.160
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.322	0.725	0.418	1.258	0.252
Ever-married*		1			
Socioeconomic status					
Low	-21.965	0.000	0.000	-	0.999
Middle	-0.758	0.469	0.311	0.705	**<0.001**
High*		1			

*=Reference Category, R Square = 4.5- 6.0%

The logistic regression analysis shows that age and socioeconomic status were significant predictors of utilisation of patent medicine stores for nutrition services, while sex, tribe, and marital status were not significant predictors. Increasing age was associated with a slight but significant reduction in utilisation (OR = 0.977, 95% CI: 0.956–0.999, p = 0.044), indicating that older respondents were less likely to obtain nutrition services from patent medicine stores. Respondents in the middle socioeconomic class were significantly less likely to utilise patent medicine stores for nutrition compared to those in the high socioeconomic class (OR = 0.469, 95% CI: 0.311–0.705, p < 0.001), showing a clear socioeconomic influence on utilisation. Although males had lower odds of utilisation than females (OR = 0.765), this difference was not statistically significant (p = 0.130), meaning sex did not independently affect utilisation. Tribe also did not significantly influence utilisation, as Edo indigenes and non-indigenes showed similar odds (OR = 0.777, p = 0.160). Marital status was not a

significant predictor either, as never-married respondents had lower odds than ever-married respondents (OR = 0.725), but this was not statistically significant (p = 0.252).

SECTION C: PERCEIVED BENEFITS AND RISKS OF PATRONIZING PATENT MEDICINE STORES/VENDORS

Variable	Yes (n=550) n(%)	No (n=550) n(%)
Closer proximity than other health facilities	394 (71.6)	156 (28.4)
Affordability	328 (59.6)	222 (40.4)
Shorter waiting time	407 (74.0)	143 (26.0)
Extended operating hours	339 (61.6)	211 (38.4)
Trust in vendor's advice	202 (36.7)	348 (63.3)
Perceived treatment effectiveness	332 (60.4)	218 (39.6)
Meet family's basic health needs	287 (52.2)	263 (47.8)

Table 27: Respondents' perceived benefits of patronizing patent medicinestores/vendors

The most widely identified benefit was shorter waiting times (74.0%), followed by closer proximity than other health facilities (71.6%), extended operating hours when health centers are closed (61.6%), and perceived recovery after treatment (60.4%). Affordability was also recognized by over half of respondents (59.6%), and 52.2% agreed that PMVs meet their family's basic health needs. However, trust in the advice provided by vendors was notably lower, with only 36.7% expressing confidence in the guidance received.

Variable	Yes (n=550) n(%)	No (n=550) n(%)
Sale of medicine without prescription	257 (46.7)	293 (53.3)
Poor quality or expired medicine	225 (40.9)	325 (59.1)
Insufficient vendor training	249 (45.3)	301 (54.7)
Subsequent hospital visit due to treatment failure	186 (33.8)	364 (66.2)
Incorrect dosage or advice	233 (42.4)	317 (57.6)
Concern about medication side effects	216 (39.3)	334 (60.7)
Delay in receiving proper medical care	277 (50.4)	273 (49.6)

Table 28: Respondents' perceived risks of patronizing patent medicine stores/vendors

Approximately half of respondents believed that using PMVs may delay proper medical care (50.4%). Concerns were also expressed regarding the sale of medicines without prescriptions (46.7%), insufficient vendor training (45.3%), incorrect dosing or advice (42.4%), poor quality or expired medicines (40.9%), and potential side effects (39.3%). Notably, a smaller proportion (33.8%) reported having to seek hospital care after PMV treatment due to ineffective medicine.

Table 29: Socio-demographic characteristics of respondents and perceived treatment effectiveness by respondents

Variable	Perceived treatment effectiveness		Test Statistic (χ^2)	p-value
	Yes (n=332) n(%)	No (n=218) n(%)		
Age (Years)				
≤24	160 (61.3)	101 (38.7)	3.110	0.380
25-44	127 (58.8)	89 (41.2)		
45-59	38 (66.7)	19 (33.3)		
≥ 60	7 (43.8)	9 (56.3)		
Sex				
Male	153 (62.2)	93 (37.8)	0.624	0.432
Female	179 (58.9)	125 (41.1)		
Tribe				
Edo-indigenes	213 (63.2)	124 (36.8)	2.936	0.090
Non-Edo-indigenes	119 (55.9)	94 (44.1)		
Marital Status				
Never-married	233 (58.7)	164 (41.3)	1.670	0.207
Ever-married	99 (64.7)	54 (35.3)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	*1.622	0.453
Middle	180 (59.6)	122 (40.4)		
High	149 (60.8)	96 (39.2)		

*=Fisher's Exact

This table examines the association between the sociodemographic characteristics of respondents and their perceived effectiveness of treatments received from patent medicine vendors. The table shows that there was no statistically significant association between socio-demographic characteristics and perceived treatment effectiveness, as all p-values were greater than 0.05. Although perceived effectiveness was slightly higher among respondents aged 45–59 years (66.7%) and lowest among those ≥60 years (43.8%), these differences were

not significant (p = 0.380). Males (62.2%) reported slightly higher perceived effectiveness than females (58.9%), but this was not statistically significant (p = 0.432). Similarly, Edo indigenes (63.2%) reported higher perceived effectiveness than non-Edo indigenes (55.9%), though this was not significant (p = 0.090). Ever-married respondents (64.7%) also reported slightly higher perceived effectiveness than never-married respondents (58.7%), but this difference was not statistically significant (p = 0.207). Socioeconomic status showed no meaningful differences in perceived effectiveness, with similar proportions across middle and high SES groups and no statistical significance (p = 0.453). Overall, perceived treatment effectiveness was moderately high but not influenced by age, sex, tribe, marital status, or socioeconomic status.

Table 30: Socio-demographic characteristics of respondents and the services' ability to meet the basic needs of the family

Variable	Ability of services to meet the family's basic needs		Test Statistic (χ^2)	p-value
	Yes (n=287) n(%)	No (n=263) n(%)		
Age (Years)				
≤24	138 (52.9)	123 (47.1)	0.671	0.887
25-44	111 (51.4)	105 (48.6)		
45-59	31 (54.4)	26 (45.6)		
≥ 60	7 (43.8)	9 (56.3)		
Sex				
Male	130 (52.8)	116 (47.2)	0.079	0.797
Female	157 (51.6)	147 (48.4)		
Tribe				
Edo-indigenes	181 (53.7)	181 (53.7)	0.814	0.382
Non-Edo-indigenes	106 (49.8)	107 (50.2)		
Marital Status				
Never-married	200 (50.4)	197 (49.6)	1.861	0.183
Ever-married	87 (56.9)	66 (43.1)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	*2.392	0.367
Middle	156 (51.7)	146 (48.3)		
High	128 (52.2)	117 (47.8)		

*=Fisher's Exact

The table above examines the association between the sociodemographic characteristics of respondents and their perception of whether patent medicine vendor services meet their family's basic needs. The table shows that there was no statistically significant association between socio-demographic characteristics and the perceived ability of services to meet family basic needs, as all p-values were greater than 0.05. Although respondents aged 45–59 years (54.4%) and those in the ≤24 years group (52.9%) reported slightly higher positive

responses compared to those ≥60 years (43.8%), these differences were not statistically significant (p = 0.887). Males (52.8%) and females (51.6%) had almost similar responses, with no significant difference (p = 0.797). Similarly, Edo indigenes (53.7%) and non-Edo indigenes (49.8%) showed comparable perceptions, and this was not significant (p = 0.382). Ever-married respondents (56.9%) reported slightly higher agreement than never-married respondents (50.4%), but this difference was also not statistically significant (p = 0.183). Socioeconomic status showed no meaningful variation, as responses were similar across middle and high SES groups, with no statistical significance (p = 0.367). Overall, perceived ability of services to meet family basic needs was moderate and not influenced by age, sex, tribe, marital status, or socioeconomic status.

Table 31: Socio-demographic characteristics of respondents and the concerns of the respondents of the side effects of medications sold by PMVs

Variable	Concern about medication side effects		Test Statistic (χ^2)	p-value
	Yes (n=216) n(%)	No (n=334) n(%)		
Age (Years)				
≤24	86 (33.0)	175 (67.0)	12.460	**0.006**
25-44	93 (43.1)	123 (56.9)		
45-59	26 (45.6)	31 (54.4)		
≥ 60	11(68.8)	5 (31.3)		
Sex				
Male	92 (37.4)	154 (62.6)	0.656	0.431
Female	124 (40.8)	180 (59.2)		
Tribe				
Edo-indigenes	133 (39.5)	204 (60.5)	0.014	0.929
Non-Edo-indigenes	83 (39.0)	130 (61.0)		
Marital Status				
Never-married	200 (50.4)	197 (49.6)	1.861	0.183
Ever-married	87 (56.9)	66 (43.1)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*5.413	**0.046**
Middle	108 (35.8)	194 (64.2)		
High	108 (44.1)	137 (55.9)		

*=Fisher's Exact

The table above examines the association between sociodemographic characteristics and respondents' concerns regarding the side effects of medications sold by patent medicine vendors (PMVs). The table shows that concern about medication side effects was significantly associated with age and socioeconomic status, while sex, tribe, and marital status were not significantly associated. Concern increased with age, ranging from 33.0% among respondents ≤24 years to 68.8% among those ≥60 years, and this association was statistically significant ($\chi^2 = 12.460$, $p = 0.006$), indicating that older respondents were more likely to worry about medication side effects. Females (40.8%) reported slightly higher concern than males (37.4%), but this difference was not statistically significant ($p = 0.431$). Similarly, there was no significant difference between Edo indigenes (39.5%) and non-Edo

indigenes (39.0%) ($p = 0.929$). Marital status also showed no significant association with concern about side effects ($p = 0.183$), although ever-married respondents reported slightly higher concern. However, socioeconomic status was significantly associated with concern ($\chi^2 = 5.413$, $p = 0.046$), with higher concern observed among high SES respondents (44.1%) compared to middle SES (35.8%) and no reported concern in the low SES group (0.0%), although interpretation is limited due to the very small number in the low SES category. Overall, concern about medication side effects was mainly influenced by age and socioeconomic status, with higher concern among older and higher SES respondents.

Table 32: Sociodemographic Characteristics and the Perceived Risk of Delayed Medical Care Due to PMV Patronage

Variable	Delay in receiving proper medical care		Test Statistic (χ^2)	p-value
	Yes (n=277) n(%)	No (n=273) n(%)		
Age (Years)				
≤24	121 (46.4)	140 (53.6)	6.591	0.086
25-44	111 (51.4)	105 (48.6)		
45-59	37 (64.9)	20 (35.1)		
≥ 60	8 (50.0)	8 (50.0)		
Sex				
Male	109 (44.3)	137 (55.7)	6.527	**0.013**
Female	168 (55.3)	136 (44.7)		
Tribe				
Edo-indigenes	178 (52.8)	159 (47.2)	2.099	0.162
Non-Edo-indigenes	99 (46.5)	114 (53.5)		
Marital Status				
Never-married	200 (50.4)	197 (49.6)	1.861	0.183
Ever-married	87 (56.9)	66 (43.1)		
Socioeconomic status				
Low	0 (0.0)	3 (100.0)	*8.402	0.008
Middle	139 (46.0)	163 (54.9)		
High	138 (56.3)	107 (43.7)		

*=Fisher's Exact

The table explores the association between sociodemographic characteristics and the perception of whether patronizing patent medicine vendors (PMVs) leads to a delay in seeking proper medical care. The table shows that delay in receiving proper medical care was significantly associated with sex and socioeconomic status, while age, tribe, and marital status were not significantly associated. Females (55.3%) reported a higher proportion of delay in receiving proper medical care compared to males (44.3%), and this difference was statistically significant ($\chi^2 = 6.527$, $p = 0.013$), indicating that females were more likely to experience delays. Age showed an increasing trend in delay with older respondents reporting higher proportions (up to 64.9% in the 45–59 years group), but this was not statistically significant ($p = 0.086$). There was no significant association between tribe and delay in care

($p = 0.162$), as Edo indigenes (52.8%) and non-indigenes (46.5%) showed similar patterns. Marital status also showed no significant difference ($p = 0.183$), although ever-married respondents had slightly higher reported delay. However, socioeconomic status was significantly associated with delay ($\chi^2 = 8.402$, $p = 0.008$), with higher delay reported among high SES respondents (56.3%) compared to middle SES (46.0%) and no reported delay in the low SES group (0.0%), though interpretation is limited due to the very small low SES sample size. Overall, delay in receiving proper medical care was mainly influenced by sex and socioeconomic status, with higher delay among females and high SES respondents.

Table 33: Predictors of Perceived effectiveness of the services rendered by patent medicine vendors of the respondents

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.015	0.986	0.964	1.007	0.193
Sex					
Male	0.161	1.175	0.829	1.664	0.365
Female*		1			
Tribe					
Edo-indigenes	0.278	1.321	0.928	1.880	0.123
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.497	0.608	0.353	1.050	0.074
Ever-married*		1			
Socioeconomic status					
Low	20.767	1044663290	0.000	-	0.999
Middle	-0.041	0.960	0.644	1.431	0.842
High*		1			

*=Reference Category, R Square = 1.3-1.7%

The logistic regression analysis shows that none of the predictors (age, sex, tribe, marital status, and socioeconomic status) were statistically significant determinants of perceived effectiveness of services rendered by patent medicine vendors. Age had a slight negative association with perceived effectiveness (OR = 0.986), but this was not significant (p = 0.193), indicating that perceived effectiveness did not meaningfully change with increasing age. Males had slightly higher odds of perceiving the services as effective compared to females (OR = 1.175), but this was not statistically significant (p = 0.365), so sex did not influence perception. Edo indigenes also had higher odds of perceiving effectiveness than non-indigenes (OR = 1.321), but this difference was not significant (p = 0.123), indicating no tribal effect. Marital status showed that never-married respondents were less likely to perceive the services as effective compared to ever-married respondents (OR = 0.608), but this was not statistically significant (p = 0.074). Socioeconomic status did not significantly influence perceived effectiveness, as neither middle SES nor low SES differed meaningfully from the high SES group.

Table 34: Predictors of Perceived ability of the services rendered by patent medicine vendors to meet the basic needs of the respondents' families

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.008	0.992	0.971	1.014	0.469
Sex					
Male	0.060	1.061	0.755	1.492	0.469
Female*		1			
Tribe					
Edo-indigenes	0.127	1.135	0.802	1.606	0.475
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.420	0.657	0.387	1.114	0.119
Ever-married*		1			
Socioeconomic status					
Low	21.139	1516015982	0.000	-	0.999
Middle	0.042	1.043	0.705	1.542	0.835
High*		1			

*=Reference Category, R Square = 1.2-1.6%

The logistic regression analysis shows that none of the socio-demographic variables (age, sex, tribe, marital status, and socioeconomic status) were statistically significant predictors of the perceived ability of patent medicine vendors' services to meet the basic needs of respondents' families. Age had a negligible negative association with perceived ability (OR = 0.992), but this was not significant (p = 0.469), indicating that perceptions did not change with age. Males had slightly higher odds of perceiving that services met family needs compared to females (OR = 1.061), but this was not statistically significant (p = 0.469), showing no sex-based difference. Edo indigenes also had marginally higher odds than non-indigenes (OR = 1.135), but this was not significant (p = 0.475), indicating no tribal influence. Never-married respondents had lower odds of positive perception compared to ever-married respondents (OR = 0.657), but this was not statistically significant (p = 0.119), Socioeconomic status also showed no significant effect.

Table 35: Predictors of Respondent Concerns Regarding Medication Side Effects from Patent Medicine Vendors

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	0.022	1.022	1.000	1.045	0.049
Sex					
Male	-0.158	0.854	0.600	1.216	0.381
Female*		1			
Tribe					
Edo-indigenes	-0.072	0.930	0.649	1.333	0.694
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.301	0.740	0.436	1.257	0.265
Ever-married*		1			
Socioeconomic status					
Low	-20.840	0.000	0.000	-	0.999
Middle	0.020	1.020	0.681	1.529	0.922
High*		1			

*=Reference Category, R Square = 1.2-1.6%

The logistic regression analysis shows that age was the only statistically significant predictor of concern about medication side effects, while sex, tribe, marital status, and socioeconomic status were not significant. Increasing age was associated with a slight but statistically significant increase in the likelihood of being concerned about medication side effects (OR = 1.022, 95% CI: 1.000–1.045, p = 0.049), indicating that older respondents were more likely to express concern. Sex did not significantly influence concern, as males had slightly lower odds compared to females (OR = 0.854, p = 0.381), but this was not statistically significant. Similarly, tribe was not a significant predictor, with Edo indigenes showing comparable odds to non-indigenes (OR = 0.930, p = 0.694), indicating no ethnic difference in concern levels. Marital status also did not significantly affect concern, as never-married respondents had lower odds than ever-married respondents (OR = 0.740, p = 0.265), but this was not statistically meaningful. Socioeconomic status also showed no significant influence.

Table 36: Predictors of the Perceived Risk of Delayed Medical Care Due to PMV Patronage

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	0.017	1.017	0.995	1.040	0.122
Sex					
Male	-0.440	0.644	0.457	0.908	**0.012**
Female*		1			
Tribe					
Edo-indigenes	0.235	1.265	0.894	1.791	0.184
Non-Edo-indigenes		1			
Marital Status					
Never-married	0.261	1.298	0.761	2.213	0.339
Ever-married*		1			
Socioeconomic status					
Low	-21.447	0.000	0.000	-	0.999
Middle	-0.289	0.749	0.505	1.110	0.542
High*		1			

*=Reference Category, R Square = 3.3- 4.3%

The logistic regression analysis shows that sex was the only statistically significant predictor of the perceived risk of delayed medical care due to patronage of patent medicine vendors, while age, tribe, marital status, and socioeconomic status were not significant. Males were significantly less likely to perceive a risk of delayed medical care compared to females (OR = 0.644, 95% CI: 0.457–0.908, p = 0.012), indicating that females were more likely to perceive this risk when using patent medicine vendors. Age showed a slight positive association with perceived risk (OR = 1.017), but this was not statistically significant (p = 0.122), meaning age did not meaningfully influence perception. Tribe was also not a significant predictor, as Edo indigenes had slightly higher odds than non-indigenes (OR = 1.265), but this was not significant, indicating no ethnic influence. Marital status did not significantly affect perceived risk, as never-married respondents had slightly higher odds than ever-married respondents (OR = 1.298), but this was not statistically significant. Socioeconomic status also showed no significant effect, as neither middle nor low SES differed significantly from high SES.

SECTION D: FACTORS ASSOCIATED WITH THE UTILISATION OF PATENT MEDICINE STORES/VENDORS

Table 37: Factors influencing respondents' utilisation of patent medicine stores/vendors

Variable	Yes (n=550) n(%)	No (n=550) n(%)
Cost of services	324 (58.9)	226 (41.1)
Flexible payment options	257 (46.7)	293 (53,3)
Proximity to home	385 (70,0)	165 (30.0)
Extended operating hours	341 (62,0)	209 (38,0)
Distance to travel	254 (46.2)	296 (53.8)
Recommendation from family or friends	188 (34,2)	362 (65.8)
Greater trust in PMVs than formal facilities	70 (12.7)	480 (87.3)
Vendor’s knowledge and skill	193 (35.1)	357 (64.9)
Availability of medicines	304 (55.3)	246 (44.7)
Previous positive experience	338 (61.5)	212 (38.5)

The most influential factors driving utilisation of patent medicine vendors were proximity to home (70.0%), extended operating hours (62.0%), and previous positive experiences (61.5%). Cost of services also played a substantial role, with 58.9% of respondents indicating it influenced their decision, while availability of medicines was cited by 55.3%. Other factors were less prominent: flexible payment options (46.7%), distance traveled (46.2%), vendor's knowledge and skill (35.1%), and recommendations from family or friends (34.2%). Notably, only 12.7% of respondents reported trusting PMVs more than formal healthcare facilities, suggesting that while convenience and accessibility drive patronage, formal providers may retain greater perceived trustworthiness.

SECTION E: LEVEL OF SATISFACTION OF RESIDENTS WITH HEALTH SERVICES PROVIDED BY PMVs

Table 38: Respondents' level of satisfaction with services provided by patent medicine stores/vendors

Variable	Frequency (n=550)	Percent
Very satisfied	49	8.9
Satisfied	324	58.9
Neutral	89	16.2
Dissatisfied	80	14.5
Very dissatisfied	8	1.5

The majority of respondents expressed satisfaction with the services provided by patent medicine vendors, with 58.9% reporting being satisfied and an additional 8.9% reporting being very satisfied. A neutral stance was held by 16.2% of respondents, while dissatisfaction was relatively low: 14.5% were dissatisfied and only 1.5% were very dissatisfied.

Table 39: Respondents' likelihood of continuing to use patent medicine stores/vendors for health services

Variable	Frequency (n=550)	Percent
Very likely	112	20.4
Likely	250	45.5
Neutral	122	22.2
Unlikely	45	8.2
Very unlikely	21	3.7

Almost half (45.5%) of respondents indicated they were likely to continue using PMVs for health services, and 20.4% were very likely. Approximately one-fifth (22.2%) remained neutral, while a minority expressed reluctance, with 8.2% unlikely and 3.8% very unlikely to continue patronage. This suggests sustained demand for PMV services within the community.

Table 40: Respondents' willingness to recommend patent medicine stores/vendors to others

Variable	Frequency (n=550)	Percent
Yes	387	70.4
No	163	29.6

A strong majority of respondents (70.4%) reported that they would recommend patent medicine vendors to others, compared to 29.6% who would not. This high endorsement rate reinforces the positive perception of PMVs and indicates a level of trust and confidence in the services they provide to the community.

Table 41: Satisfaction of respondents with patent medicine stores/vendors

Variable	Frequency (n=550)	Percent
Satisfied	364	66.2
Unsatisfied	186	33.8

Overall, the majority of respondents (66.2%) reported being satisfied with the health services provided by patent medicine stores/vendors, while approximately one-third (33.8%) expressed dissatisfaction.

Table 42: Sociodemographic Characteristics and Respondents' Willingness to Recommend Patent Medicine Vendors

Variable	Willingness to recommend PMVs		Test Statistic (χ^2)	p-value
	Yes (n=387) n(%)	No (n=163) n(%)		
Age (Years)				
≤24	189 (72.4)	72 (27.6)	2.253	0.527
25-44	149 (69.0)	67 (31.0)		
45-59	40 (70.2)	17 (29.8)		
≥ 60	9 (56.3)	7 (43.8)		
Sex				
Male	194 (78.9)	52 (21.1)	15.413	**<0.001**
Female	193 (63.5)	111 (36.5)		
Tribe				
Edo-indigenes	241(71.5)	96 (28.5)	0.552	0.502
Non-Edo-indigenes	146 (68.5)	67 (31.5)		
Marital Status				
Never-married	274 (69.0)	123 (31.0)	1.240	0.298
Ever-married	113 (73.9)	40 (26.1)		
Socioeconomic status				
Low	2 (66.7)	1 (33.3)	*1.745	0.430
Middle	219 (72.5)	83 (27.5)		
High	166 (67.8)	79 (32.2)		

*=Fisher's Exact

The table shows that sex was the only socio-demographic factor significantly associated with willingness to recommend patent medicine vendors (PMVs), while age, tribe, marital status, and socioeconomic status were not significant. A higher proportion of males (78.9%) were willing to recommend PMVs compared to females (63.5%), and this difference was statistically significant ($\chi^2 = 15.413$, $p < 0.001$), indicating that males were more likely to recommend PMVs. Although willingness to recommend was relatively high across all age groups, with the highest among ≤24 years (72.4%) and lowest among ≥60 years (56.3%), this variation was not statistically significant ($p = 0.527$). Similarly, there were no significant differences between Edo indigenes (71.5%) and non-indigenes (68.5%) ($p = 0.502$), or between ever-married (73.9%) and never-married respondents (69.0%) ($p = 0.298$). Socioeconomic status also showed no significant association, with comparable willingness across groups ($p = 0.430$).

Table 43: Socio-demographic characteristics and level of satisfaction of residents with health services provided by patent medicine stores/vendors

Variable	Level of Satisfaction		Test Statistic (χ^2)	p-value
	Satisfied (%)	Unsatisfied (%)		
Age (Years)				
≤24	173 (63.3)	88 (33.7)	2.733	0.438
25-44	142 (65.7)	74 (34.3)		
45-59	41 (71.9)	16 (28.1)		
≥ 60	8 (50.0)	8 (50.0)		
Sex				
Male	180 (73.2)	66 (26.8)	9.713	**0.002**
Female	184 (60.5)	120 (39.5)		
Tribe				
Edo-indigenes	227 (67.4)	110 (32.6)	0.539	0.517
Non-Edo-indigenes	137 (64.3)	76 (35.7)		
Marital Status				
Never-married	254 (64.0)	143 (36.0)	3.092	0.088
Ever-married	110 (71.9)	43 (28.1)		
Socioeconomic status				
Low	3 (100.0)	0 (0.0)	1.975*	0.327
Middle	194 (64.2)	108 (35.8)		
High	167 (68.2)	78 (31.8)		

*=Fisher's Exact

The table shows that sex was the only socio-demographic factor significantly associated with level of satisfaction with services from patent medicine vendors, while age, tribe, marital status, and socioeconomic status were not significant. A higher proportion of males (73.2%) were satisfied compared to females (60.5%), and this difference was statistically significant (χ^2 = 9.713, p = 0.002), indicating that males were more likely to report satisfaction. Although satisfaction appeared higher among respondents aged 45–59 years (71.9%) and lowest among those ≥60 years (50.0%), this variation was not statistically significant (p = 0.438). There was no significant difference between Edo indigenes (67.4%) and non-indigenes (64.3%) (p = 0.517), indicating no tribal influence on satisfaction. Ever-married respondents (71.9%) reported higher satisfaction than never-married respondents (64.0%), but this difference was not statistically significant. Similarly, satisfaction levels were comparable across socioeconomic groups (p = 0.327), indicating that economic status did not significantly influence satisfaction.

Table 44: Predictors of the Respondents' Willingness to Recommend Patent Medicine Vendors

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.027	0.973	0.951	0.996	**0.023**
Sex					
Male	0.781	2.183	1,477	3.224	**<0.001**
Female*		1			
Tribe					
Edo-indigenes	0.113	1.120	0.768	1.634	0.556
Non-Edo-indigenes		1			
Marital Status					
Never-married	-0.828	0.437	0.240	0.797	0.007
Ever-married*		1			
Socioeconomic status					
Low	-0.044	0.957	0.082	11.163	0.972
Middle	0.170	1.186	0.770	1.827	0.439
High*		1			

*=Reference Category, R Square = 4.4- 6.2%

The logistic regression analysis shows that age, sex, and marital status were significant predictors of respondents' willingness to recommend patent medicine vendors (PMVs), while tribe and socioeconomic status were not significant. Increasing age was associated with a slight but significant decrease in willingness to recommend PMVs (OR = 0.973, 95% CI: 0.951–0.996, p = 0.023), indicating that younger respondents were more likely to recommend them. Males were significantly more likely to recommend PMVs compared to females (OR = 2.183, 95% CI: 1.477–3.224, p < 0.001), showing a strong influence of sex on recommendation behavior. Never-married respondents were significantly less likely to recommend PMVs compared to ever-married respondents (OR = 0.437, 95% CI: 0.240–0.797, p = 0.007), indicating higher willingness among married individuals. Tribe did not significantly influence willingness to recommend PMVs, as Edo indigenes and non-indigenes had similar odds (OR = 1.120, p = 0.556). Socioeconomic status also showed no significant

effect, as neither low nor middle SES differed from high SES (p = 0.972 and p = 0.439 respectively).

Table 45: Predictors of level of satisfaction of residents with health services provided by patent medicine stores/vendors

Predictors	β Coefficient	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age (Years)	-0.017	0.983	0.957	0.961	1.004
Sex					
Male	0.595	1.812	1.256	2.614	**0.001**
Female*		1			
Tribe					
Edo-indigenes	0.103	1.109	0.764	1.609	0.588
Non-Edo-indigenes*		1			
Marital Status					
Never-married	-0.351	0.704	0.467	1.063	0.095
Ever-married*		1			

*=Reference Category, R Square = 2.8 -3.9%

The logistic regression analysis shows that sex was the only statistically significant predictor of residents' level of satisfaction with health services provided by patent medicine stores/vendors, while age, tribe, and marital status were not significant predictors. Males were significantly more likely to be satisfied with the services compared to females (OR = 1.812, 95% CI: 1.256–2.614, p = 0.001), indicating a strong influence of sex on satisfaction. Age showed a slight negative association with satisfaction (OR = 0.983), but this was not statistically significant, indicating that satisfaction did not meaningfully change with increasing age. Edo indigenes had slightly higher odds of satisfaction compared to non-indigenes (OR = 1.109), but this was not statistically significant (p = 0.588), showing no influence of tribe on satisfaction. Never-married respondents had lower odds of satisfaction compared to ever-married respondents (OR = 0.704), but this was not statistically significant (p = 0.095), indicating that marital status did not significantly influence satisfaction.

CHAPTER FIVE

DISCUSSION

The findings of this study offer a detailed view of how residents of Ovia North East Local Government Area use patent medicine stores and vendors for their health needs. Patent medicine vendors are heavily relied upon for common illnesses such as malaria, fever and headache, but are rarely used for sensitive services like family planning or treatment of sexually transmitted infections. Residents value the convenience, proximity and speed of these vendors, yet they are well aware of the risks, including delayed medical care and the sale of medicines without prescription. Utilisation is driven mainly by accessibility rather than trust, and while most residents are satisfied with the services, satisfaction is notably lower among women. These findings have important implications for policy and practice, which are discussed below in relation to each of the four study objectives.

Regarding the types of health services sought, a pronounced hierarchy was evident. Almost all respondents had obtained malaria treatment from a patent medicine vendor at least once in the preceding year, with a substantial proportion doing so frequently. Headache and pain relief were similarly sought by the majority of respondents, while treatment for general fever and for cough or respiratory symptoms were each accessed by approximately four out of every five respondents. These findings closely mirror patterns reported in other settings. In rural Uganda, PMVs were found to be the primary source of antimalarials, analgesics, and antibiotics for febrile illnesses[23]. In Bangladesh, informal drug sellers routinely dispensed painkillers, antidiarrheals, and medicines for febrile conditions [22,26]. Within Nigeria, studies in Kwara and Ebonyi States have documented that up to three-quarters of community

members use patent medicine vendors as their first point of care for malaria and common childhood illnesses[2,25]. The likely reasons for this reliance are clear. Malaria is hyperendemic in this ecological zone, its symptoms are well recognised by the public, and vendors offer antimalarials without the bureaucratic obstacles typical of formal health facilities. From a public health perspective, these factors position PMVs as first-line providers for malaria case management, making them a critical point of intervention in any strategy to improve malaria control. However, a significant consequence of leaving PMVs unregulated is that, despite their potential to expand access to antimalarials, they may instead encourage presumptive treatment. This practice, which involves administering antimalarials without a confirmed diagnosis, may contribute to the development of drug resistance and thus undermine public health gains. To prevent this outcome, a structured regulatory framework should be implemented, including mandatory training and certification for PMVs, routine supervision, subsidised diagnostic tools, and clear protocols requiring rapid diagnostic test confirmation before ACT dispensing. Such measures would preserve therapeutic efficacy while safely maintaining access.

In contrast, services related to sexual and reproductive health were greatly underutilised. Only about one-fifth of respondents had ever used patent medicine vendors for family planning products or reproductive health advice, and barely one in ten had sought treatment for a sexually transmitted infection. Referral services and vaccination advice were also infrequently accessed, with roughly two-fifths and under one-third reporting any use within the past year. These gaps are consistent with earlier Nigerian work, including the IntegratE Project's findings in Lagos and Kaduna States which showed that while clients appreciated the convenience of vendors for refilling contraceptives, uptake remained low due to privacy concerns and prevailing myths surrounding family planning[7,31]. In Ebonyi State, it was observed that although family planning commodities were available, only a quarter of

respondents made use of them[25]. The profound underutilisation of sexual and reproductive health services likely arises from a combination of factors. Many residents fear that seeking such services from a neighbourhood vendor will be observed by other members of the community and lead to gossip or judgement, a concern that is especially common amongst unmarried young people. Vendors themselves may be reluctant to stock or openly display contraceptives and treatments for sexually transmitted infections for fear of being perceived as promoting promiscuity. Furthermore, the absence of private consultation spaces in most patent medicine shops renders any discussion of sensitive matters virtually impossible. From a public health viewpoint, this represents a significant missed opportunity. Patent medicine vendors are geographically accessible and trusted for general ailments; if appropriately trained, accredited, and equipped with private counselling corners, they could meaningfully extend the reach of family planning, syndromic management of sexually transmitted infections, and reproductive health education. Without such interventions, young, sexually active individuals are likely to forgo preventive services altogether or resort to unsafe sources, thereby contributing to unintended pregnancies and the spread of infections.

The sociodemographic patterning of utilisation adds an important perspective. For malaria treatment, use was uniformly high across all age groups, sexes, ethnicities, marital status categories, and socioeconomic strata. This universality highlights malaria's status as a community-wide health burden that cuts across demographic boundaries. No single subgroup was less likely to use vendors for malaria, a universal pattern rarely seen in health-seeking behaviour, indicating that PMVs have become the main providers of antimalarials, a situation documented earlier in a systematic review of their roles in Nigeria[17]. For diarrhoea treatment, however, significant differences emerged. Use was notably higher among adults aged twenty-five to forty-four years, females, and those of higher socioeconomic status. This pattern is expected as young and middle-aged women are typically the primary caregivers for

children under five, who suffer the highest incidence of diarrhoeal disease, and they are the ones who likely purchase oral rehydration salts and zinc from the nearest vendor. Higher socioeconomic status enables more frequent purchases of prepackaged oral rehydration solution rather than home-prepared mixtures, and may also be associated with better health literacy and awareness of the need for prompt rehydration. These findings align with studies in Uganda and Bangladesh that identified caregiver sex and household wealth as determinants of drug shop utilisation for childhood illnesses [23,26]. For family planning products, utilisation peaked among adults aged twenty-five to forty-four, those who were ever-married, and those of higher socioeconomic status, while it was extremely low among younger, never-married individuals. This is consistent with the expected life-course of reproductive needs, where married couples in their childbearing years have the greatest demand for contraception. The very low use among never-married youth may reflect not only lower perceived need but also significant stigma, as earlier qualitative work in Nigeria; Lagos and Kaduna, found that young unmarried women avoided purchasing contraceptives from vendors for fear of being labelled promiscuous[7]. The fact that PMVs are largely bypassed for family planning products by the youths represents a critical vulnerability in the public health system leading to increasing number of unmet contraceptive needs amongst this population. The pattern for reproductive health advice mirrored that of family planning, with higher use among ever-married and higher socioeconomic status respondents which may be for the same reasons as stated for family planning utilisation.

The treatment of sexually transmitted infections showed the lowest overall utilisation. Ever-married individuals and those of higher socioeconomic status were relatively more likely to have used vendors for this service. This suggests that when the need is compelling, as in a married person who suspects an infection, some will overcome the barriers of stigma and privacy to seek help from a PMV, particularly if that vendor has previously supplied

other medicines discreetly. Skin problems and referral services showed only marital status as a significant correlate, with ever-married individuals using them more. This could be attributed to the fact that ever-married individuals are more likely to have children and would want to prevent spread of skin infections as well as require prompt referral services to adequately care for them. Vaccination advice utilisation was higher among older adults, ever-married respondents, and those of higher socioeconomic status, probably because these groups are more likely to have young children requiring vaccination and are more proactive about seeking information. Nutrition service utilisation was strongly associated with socioeconomic status, a finding that is unsurprising given that vitamin and mineral supplements are often regarded as discretionary preventive items that wealthier households can afford.

When the combined influence of multiple sociodemographic factors was examined simultaneously, the most consistent determinant of vendor use across a broad range of services was marital status. Being ever-married was independently associated with higher odds of using vendors for malaria, fever, headache, family planning, reproductive health advice, STI treatment, skin problems, referral, and vaccination advice. This corroborates previous research demonstrating that household structure and care-giving roles are central determinants of patent medicine vendor patronage in Nigeria[3,4]. Married individuals are not merely seeking care for themselves; they are the health decision-makers and purchasers for their spouses, children, and sometimes elderly parents. Their cumulative exposure to health needs is greater, and over time they develop practical knowledge of which vendors stock reliable products and which do not. Younger age was also an independent predictor for several common symptomatic complaints, including malaria, fever, cough, and headache, suggesting that younger adults, who may have young children at home, bear the brunt of acute infectious episodes and turn to vendors for rapid relief. Female sex was a significant

predictor for diarrhoea treatment and reproductive health advice, consistent with women's gatekeeping roles in child health and their own reproductive needs. Higher socioeconomic status independently predicted utilisation for diarrhoea treatment and nutrition services, reflecting both ability to pay and greater health awareness.

These patterns closely mirror international evidence. In rural Uganda, drug shops were the primary source of antimalarials and antibiotics for childhood febrile illnesses, while family planning was rarely discussed[23]. In Bangladesh, a study of village doctors found that while they were widely used for acute childhood illnesses through the Integrated Management of Childhood Illnesses model, reproductive health services were virtually absent from their repertoire[26]. The Seven Communities East and West Africa study reported that across sites in Uganda, Kenya, and Ghana, community members consistently rated vendors highly for accessibility and convenience but were reluctant to use them for stigmatised conditions[28]. These findings show that the drivers of vendor utilisation and the reasons for service- specific underutilisation are deeply rooted in social norms, gender roles, and the structure of informal healthcare markets. The public health implication is clear: any attempt to broaden the scope of vendor services into reproductive and sexual health must address not only the clinical competence of vendors but also the social environment in which services are delivered. Structural interventions such as private counselling spaces, community sensitisation to reduce stigma, and explicit endorsement of vendors as safe providers of reproductive health by health authorities could potentially shift these entrenched patterns.

Turning to the perceived benefits and risks of patronising patent medicine vendors, residents demonstrated a significant and balanced appraisal. The most frequently endorsed benefits were shorter waiting times, cited by nearly three- quarters of respondents, and closer proximity than other health facilities, mentioned by roughly seven in ten. Extended operating

hours when health centres are closed were appreciated by approximately three- fifths, while perceived treatment effectiveness and affordability were each acknowledged by about three- fifths. Just over half agreed that vendors meet their family's basic health needs. These findings are entirely consistent with the global literature on informal healthcare providers. The SevenCEWA study across East and West Africa identified affordability, proximity, convenient hours, and short wait times as the predominant reasons communities favoured vendors[28]. In Ghana, clients of licensed chemical sellers reported similar satisfaction drivers, particularly prompt service and respectful interactions[35]. The fact that shorter waiting time emerged as the single most appreciated benefit speaks volumes about the performance of the formal health system in this setting. In public primary health centres, a patient with a simple febrile illness may spend several hours queuing, often to be told that the required medicine is out of stock. In contrast, a vendor transaction can be completed in a few minutes, with the medicine immediately in hand. This radical difference in time cost is a powerful incentive to bypass formal care, even among individuals who intellectually trust formal providers more.

A critical and somewhat paradoxical finding was the low level of trust in the advice provided by vendors. Only slightly more than one- third of respondents expressed confidence in the guidance they received. This suggests that the patron–vendor relationship is predominantly transactional: residents go to vendors knowing what medicine they want, often based on prior experience or lay advice, and view the vendor primarily as a dispenser rather than a clinician. This finding resonates with qualitative work in Bangladesh, where drug sellers were valued for their accessibility and credit provision, but customers often questioned their technical knowledge[22]. Similarly, in Nigeria, clients of vendors in family planning programmes expressed satisfaction with the service but noted that counselling was often incomplete[7]. The public health significance of this trust deficit is substantial. If residents do not trust the advice of vendors, they are unlikely to ask for or follow it, which increases the risk of inappropriate

self-medication, incorrect dosing, and failure to seek timely formal care for dangerous conditions. It also means that even if vendors are trained to provide better counselling, the impact may be limited unless the community's perception of vendors' clinical competence is simultaneously elevated through visible accreditation, quality seals, and public information campaigns.

On the risk side, the most prevalent concern, expressed by half of all respondents, was that using vendors could delay proper medical care. This was followed by worries about the sale of medicines without prescriptions, insufficient vendor training, incorrect dosage or advice, and poor quality or expired medicines, each cited by more than two-fifths of residents. A smaller yet clinically meaningful proportion, about one-third, reported having actually had to visit a hospital after vendor treatment because the medicine was ineffective. This last figure moves the discussion from hypothetical risk to documented harm: a substantial minority of residents have experienced treatment failure arising from vendor care, with its attendant costs, suffering, and potential for disease progression. These findings align with earlier Nigerian research. In Sokoto, over half of vendors were found to regularly sell antibiotics without prescriptions, and in Lagos and Kebbi States, concerns about inappropriate dispensing and lack of training were widespread among community members[5,31]. In Ghana, widespread non-compliance with prescription-only medicine regulations among over-the-counter medicine sellers has been documented[24]. Globally, estimates indicate that a quarter of medicines in low- and middle-income countries are substandard or counterfeit, a risk that is magnified in unregulated outlets[11]. The high level of concern about delayed medical care reflects a mature understanding among residents that while vendors offer convenience, they can also inadvertently prolong illness by masking symptoms or providing ineffective treatment.

Sociodemographic analysis revealed that concern about medication side effects increased significantly with age and with higher socioeconomic status. Older individuals are more likely to have experienced or witnessed adverse drug reactions, particularly if they take multiple medications for chronic conditions. Higher socioeconomic status is often associated with greater health literacy and exposure to health information, which may heighten awareness of medication risks. The perception of delayed medical care was significantly associated with female sex and higher socioeconomic status. Women, as primary caregivers, may be more attuned to the consequences of delayed treatment in children and other family members, and thus more likely to perceive this risk. The association with higher socioeconomic status might seem counterintuitive, but it may reflect that wealthier individuals have better access to formal care and are therefore more aware of what they might be missing by relying on vendors. None of the sociodemographic factors significantly influenced perceived treatment effectiveness or the ability of vendors to meet family basic needs, indicating that these positive perceptions are widely shared across the community and not concentrated in any particular subgroup. In analyses that considered all factors together, only age emerged as a significant predictor of concern about side effects, while female sex was the sole independent predictor of the perceived risk of delayed medical care, reinforcing the earlier observations.

The public health importance of these perception data is profound. They demonstrate that the community is not undiscriminating in its use of vendors; rather, residents are making calculated trade- offs between accessibility and safety. The challenge for the health system is to tip the balance in favour of safety without sacrificing accessibility. This requires a multi- pronged approach: improving the quality and safety of vendor services through training and regulation so that the risk side of the equation shrinks; simultaneously improving the accessibility and responsiveness of formal primary health centres so that the benefit side

of vendor utilisation becomes less compelling; and mounting sustained health education campaigns that help residents recognise when vendor care is appropriate and when it is dangerous. The fact that about one-third of respondents had experienced treatment failure leading to hospital attendance underscores the urgency of these measures.

The factors that residents themselves identified as influencing their decision to use patent medicine vendors coalesce firmly around accessibility and convenience. Proximity to home was the most frequently endorsed factor, cited by seven-tenths of respondents, followed by extended operating hours and previous positive experiences, each mentioned by roughly three-fifths. Cost of services and availability of medicines were also important for more than half of respondents. In contrast, recommendations from family or friends and trust in vendors' knowledge and skill were each cited by only about one-third, and greater trust in vendors than in formal healthcare facilities was acknowledged by a mere one in eight. This distribution confirms that vendors are valued not for their perceived clinical superiority but for their logistical advantages. Residents use vendors because they are near, open when needed, stock the required medicines, and charge affordable prices. Trust, in the relational sense, is not the primary currency of the transaction.

This pattern closely mirrors the determinants of informal healthcare use documented elsewhere. A randomised experiment in Ghana demonstrated that partial health insurance subsidies, which reduced financial barriers, led to sustained increases in healthcare utilisation, highlighting the primacy of affordability as a driver[27]. The SevenCEWA study found that across Uganda and Kenya, community members chose vendors principally for their low cost, close proximity, flexible hours, and shorter wait times, while expressing reservations about diagnostic accuracy[28]. In Nigeria, the IntegratE project reported that community pharmacists and vendors were preferred for family planning services precisely because they offered quick,

friendly, and convenient service, even though concerns about counselling quality existed[7]. The striking finding from the present study that only one in eight respondents trusted vendors more than formal facilities deserves emphasis. It suggests that residents have a clear mental model of the healthcare landscape: formal facilities are the place for serious, complex, or uncertain conditions; vendors are the place for quick, familiar, symptomatic relief. This functional differentiation has been observed in other Nigerian contexts. In Ebonyi State, despite high use of vendors for general ailments, respondents continued to express confidence in formal providers for severe illness[25].

The public health significance of this determinant profile is that formal health facilities could potentially recapture a substantial share of primary care visits by addressing the very factors that drive residents to vendors. If primary health centres were to extend their operating hours into the evenings and weekends, reduce waiting times through better triage and appointment systems, ensure consistent availability of essential medicines, and keep user fees low or exempt certain services, the convenience gap would narrow considerably. At the same time, the finding that previous positive experience is a major driver of return visits indicates that vendors could be incentivised to improve quality through market mechanisms. Accreditation systems that signal to consumers which vendors have received training and adhere to standards could leverage this experiential learning to shift patronage towards safer outlets.

Satisfaction with PMVs was high, with two-thirds of respondents reporting being satisfied or very satisfied, and only about one in six expressing dissatisfaction. This is consistent with satisfaction ratings reported in other settings. In peri-urban and rural Ghana, over four-fifths of clients expressed satisfaction with licensed chemical sellers, citing respectful interactions and speedy service[35]. In Turkey, a study of rural pharmacy users found that medicine supply reliability and staff communication were the strongest predictors of satisfaction and loyalty[34].

In Portugal, community pharmacy users reported high satisfaction with staff politeness and prompt service, though lower scores were noted for counselling on side effects[33]. This suggests that fast and respectful service and product availability were significant drivers of satisfaction..

Future intentions were strongly positive. Nearly half of respondents were likely to continue using vendors, one-fifth were very likely, and over seven-tenths stated they would recommend vendors to others. This social endorsement is a powerful indicator of the embeddedness of vendors in the community's healthcare ecosystem. It implies that any attempt to curtail vendor operations without providing adequate alternatives would not only be practically difficult but also politically unpopular. Indeed, the high recommendation rate reinforces the argument for a progressive formalisation approach, in which vendors are trained, accredited, and linked to the formal health system, rather than being outlawed or ignored.

A notable and important finding was the significant gender difference in both satisfaction and willingness to recommend. Male respondents were substantially more likely to be satisfied and to express a willingness to recommend vendors compared to their female counterparts. After accounting for other factors, male sex was associated with more than twice the odds of recommending vendors and nearly twice the odds of being satisfied. This gender gap has not been extensively reported in the vendor literature, though it is consistent with broader patterns of healthcare satisfaction. Women generally have more frequent and more varied interactions with the healthcare system, particularly during their reproductive years, and may therefore have higher expectations of interpersonal communication, privacy, and completeness of information. A hurried or dismissive vendor may be tolerated by a male client seeking a single medicine, but may cause significant dissatisfaction in a female client

who is managing a child's illness or seeking reproductive health advice. Additionally, women may be more sensitive to the privacy limitations of vendor shops, where consultations often take place over a counter within earshot of other customers. This could explain why satisfaction with vendors was lower among females despite their similar utilisation of most services. The public health implication is that quality improvement efforts must incorporate a gender lens. Training programmes for vendors should include modules on gender-sensitive communication, active listening, and the importance of privacy for female clients. Simple structural modifications, such as a curtained-off consultation area, could substantially enhance the experience of female clients and, by extension, improve the safety and acceptability of services.

In summary, this study has shown that residents of Ovia North East Local Government Area rely heavily on patent medicine vendors for common symptomatic illnesses such as malaria, fever, and headache, while underutilising them for sensitive reproductive and sexual health services. The community highly values the convenience, proximity, and speed of vendors, yet is clearly aware of the associated risks, including delayed medical care, sale of medicines without prescription, and insufficient vendor training. The main drivers of utilisation are accessibility factors, not clinical trust. Overall satisfaction is high, especially among males and ever-married individuals, and most residents would recommend vendors to others. These findings indicate that patent medicine vendors are critical but flawed fixtures in the local health system. The way forward is not to eliminate them, but to formally integrate them through targeted training, strengthened regulation, and collaborative linkages with formal health facilities. Such an approach can preserve the benefits of accessibility while substantially improving the safety and quality of care provided to the community. Without these interventions, the current pattern of transactional, under-regulated use will persist, with its attendant risks of antimicrobial resistance, treatment failure, and missed opportunities for

preventive and reproductive health care. With thoughtful policy and investment, however, patent medicine vendors can be transformed from a necessary evil into a genuine asset for primary healthcare delivery in Edo State and beyond.

Contributions to Knowledge

This study makes several original contributions to the existing body of literature on patent medicine vendors and informal healthcare delivery in Nigeria. One key contribution is the provision of detailed, community-level evidence from Ovia North East Local Government Area, a mixed rural-urban setting in Edo State that has been relatively understudied compared to other regions. Whereas much of the existing research has focused on northern or southwestern Nigeria, this study adds a much-needed southeastern perspective, revealing that the patterns of high utilisation for malaria and low utilisation for reproductive health services are consistent across different geopolitical zones[23,25]. Another important contribution is the use of both bivariate and multivariate analytical techniques to identify sociodemographic predictors of vendor use. In doing so, the study establishes that marital status is the most consistent predictor of utilisation across a wide range of health services, even after accounting for age, sex, tribe, and socioeconomic status. This finding goes beyond earlier descriptive work and highlights that family structure and household roles fundamentally shape health-seeking behaviour in ways that have not been fully appreciated[2]. Furthermore, the study makes a conceptual contribution by documenting the gap between perceived benefits and trust. While many previous studies have noted that residents value the convenience of patent medicine vendors, few have quantified the low level of trust in vendor advice only a little over one-third of respondents expressed confidence in what vendors tell them. This finding challenges the assumption that high utilisation equals high trust, and it reframes the vendor-client relationship as primarily transactional rather than relational[28,35].

Methodologically, the study adds value through its relatively large sample size and a multi-stage sampling technique that ensured geographical representation across six wards, thereby strengthening the generalisability of findings within the local government area. The inclusion of a wide range of health services, from malaria treatment to nutrition advice provides a more comprehensive picture than studies that focus on a single disease condition[23,25]. In addition, the study contributes empirical data on client satisfaction and willingness to recommend, which are important quality indicators that have received less attention than utilisation patterns. The finding that approximately two-thirds of respondents are satisfied but that satisfaction is significantly lower among females points to an underexplored gender dimension in informal healthcare quality[36]. Finally, by documenting that nearly half of respondents are concerned about delayed medical care and that about one-third have actually experienced treatment failure requiring hospital follow-up, the study provides concrete evidence of the real-world harms associated with unregulated vendor use, moving beyond hypothetical risks to documented outcomes[26,34]. Taken together, these contributions enrich the evidence base for policy and programme design in Nigeria and other low- and middle-income countries where patent medicine vendors play a similar role

Policy Implications

The findings of this study carry several urgent implications for health policy at the national, state, and local government levels. The high level of utilisation of patent medicine vendors for malaria treatment, coupled with the low level of trust in vendor advice, suggests that current regulatory approaches are insufficient. Consequently, the Pharmacists Council of Nigeria should move beyond periodic inspections and punitive measures toward a model of supportive supervision and structured training. A tiered accreditation system should be introduced, wherein vendors who complete approved training courses on malaria diagnosis

(including rapid diagnostic tests), correct dosing of artemisinin-based combination therapies, and basic referral protocols receive formal certification and are permitted to display a quality seal. Such a system would create a market incentive for vendors to upgrade their skills while giving consumers a way to identify more reliable outlet[5,23]. Another policy implication arises from the severe underutilisation of patent medicine vendors for family planning, reproductive health advice, and sexually transmitted infection treatment, which indicates that current policies that prohibit vendors from providing these services are not serving the public health interest. While deregulation without safeguards would be unwise, a pilot programme should be considered in which trained and accredited vendors are authorised to provide a limited package of reproductive health services, including distribution of condoms, oral contraceptive pills, and emergency contraception, along with referral for long-acting methods and STI testing. Such programmes have been successfully piloted in Lagos and Kaduna States under the IntegratE project, and the present study provides evidence that a similar approach would be relevant in Edo State[29,31]. In addition, the finding that accessibility factors such as proximity and extended hours are the primary drivers of vendor use has direct implications for primary health care reform. The Edo State Ministry of Health and the Ovia North East Local Government Health Authority should therefore consider operational changes at public primary health centres to make them more competitive. This could include extending operating hours into the evening on weekdays, opening for at least half a day on weekends, reducing waiting times through appointment systems or triage protocols, and establishing community health posts or mobile clinics in areas with high vendor density but no nearby facility[27,28]. Without such changes, residents will continue to bypass formal facilities for even the simplest complaints, and the quality of care they receive will remain highly variable. The finding that females are less satisfied with vendor services and less willing to recommend them points to a need for gender-sensitive regulation and training. As a result, the

Pharmacists Council of Nigeria should mandate that all vendor training programmes include a module on respectful and private communication with female clients, particularly around reproductive health issues, and vendors should be encouraged to create physical spaces within their shops where women can speak without being overheard[7,36]. Furthermore, the high level of concern about delayed medical care and the substantial proportion of respondents who have experienced treatment failure requiring hospital follow-up indicate that the current referral system between vendors and formal facilities is weak or non-existent. The Edo State Ministry of Health should therefore establish a formal referral network in which trained vendors are provided with simple referral forms and a list of nearby primary health centres and hospitals. Vendors who consistently refer patients with danger signs should be recognised and incentivised, while those found to be treating severe conditions that they should have referred should face sanctions[26,31]. Finally, the strong willingness of residents to recommend patent medicine vendors to others suggests that any policy that seeks to drastically restrict or eliminate vendors would be politically unpopular and practically unworkable. Rather than prohibition, the policy direction should be one of progressive formalisation: bringing vendors into the official health system through training, accreditation, and linkage, while maintaining the accessibility and convenience that the community values. This approach aligns with global evidence on informal healthcare provider regulation and offers the best chance of improving both access and safety for the residents of Ovia North East and similar communities across Nigeria[28,32].

CONCLUSION

This study assessed how residents of the Ovia North East Local Government Area utilise patent medicine stores and vendors for health services, and several meaningful conclusions emerged from the four main objectives.

Regarding the types of health services used, the study concludes that patent medicine vendors are primarily relied upon for the immediate management of common symptomatic illnesses such as malaria, general fever, and pain relief. In contrast, specialized and confidential services, including family planning products and treatments for sexually transmitted infections, are significantly underutilised by the community.

When considering the perceived benefits and risks, the study establishes that residents highly value the practical and logistical advantages of these vendors, namely closer proximity, shorter waiting times, and extended operating hours. At the same time, there is a strong awareness of significant clinical risks, with residents recognizing the dangers of delayed proper medical care, the sale of medicines without a prescription, and insufficient vendor training.

In terms of the factors associated with utilisation, the findings indicate that accessibility and convenience are the primary drivers of patronage. Proximity to home, flexible hours, and previous positive experiences overwhelmingly dictate the use of patent medicine vendors, heavily outweighing any actual clinical trust in the vendors when compared to formal healthcare facilities.

Finally, assessing the level of satisfaction, the study concludes that despite the recognized risks, a strong majority of residents remain highly satisfied with the services provided by these vendors. This satisfaction translates into a high likelihood of continued patronage and a

strong willingness to recommend the vendors to others, with male residents demonstrating significantly higher levels of satisfaction and advocacy than their female counterparts.

Overall, the findings highlight that patent medicine vendors effectively bridge critical gaps in primary healthcare delivery through sheer convenience and accessibility. However, to maximize safe healthcare delivery and mitigate the clinical risks associated with informal care, formal integration, strategic training, and strict regulatory oversight by public health authorities are required.

RECOMMENDATIONS

To the Pharmacists Council of Nigeria (PCN) and the Edo State Ministry of Health

- Implement and scale up tiered accreditation and structured training programs for PMVs to formally integrate them into the primary healthcare system, particularly for basic malaria management and family planning.
- Intensify regulatory oversight and routine inspections to enforce strict boundaries on the sale of prescription-only medicines and ensure the quality and proper storage of drugs sold.
- Integrate PMVs into formal health reporting structures, establishing clear referral linkages between these vendors and local health facilities.

To Patent Medicine Vendors (PMVs) and PMV Associations (e.g., NAPMED)

- Participate actively in capacity-building workshops to improve drug dispensing practices, diagnostic awareness, and proper referral protocols for severe or unresponsive illnesses.
- Reconfigure store layouts to create private, non-judgmental counseling spaces, thereby encouraging community members to utilise PMVs for reproductive, family planning, and sexual health services.
- Improve medication counseling skills to ensure clients are fully educated on correct dosages, treatment durations, and potential side effects before completing a sale.

To Ovia North East Local Government Health Authorities and Primary Health Care (PHC) Centers

- Restructure Primary Health Care (PHC) operational models to be more consumer-friendly, such as extending operating hours and minimizing wait times, to effectively compete with the convenience of the informal sector.
- Collaborate with community health workers to conduct sustained health literacy campaigns, educating the public on "red flag" symptoms that necessitate bypassing PMVs for formal medical care.

To Residents of Ovia North East Community (Individuals and Households)

- Utilise PMVs responsibly for minor symptomatic relief while actively avoiding dangerous self-medication practices, particularly the unprescribed purchase and misuse of antibiotics.
- Seek immediate care at formal health facilities for severe, persistent, or specialized health conditions including sexual and reproductive health issues to avoid dangerous delays in receiving proper medical diagnosis and treatment.

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APPENDIX 1

INFORMED CONSENT FORM

TITLE OF STUDY

Utilisation of Patent Medicine Stores/Vendors for Health Services by Residents of Ovia North East Local Government Area, Edo State.

INSTITUTION

Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin, Benin City.

PRINCIPAL INVESTIGATORS

Atamewan Sarah Eseosa

Awo-Osagie Aisosa Andrew

SUPERVISOR

Prof. V. Y Adam

FINANCIAL SPONSORSHIP

This research work is financially sponsored by the principal investigators.

PURPOSE OF RESEARCH

The purpose of this research work is to assess the Utilisation of Patent Medicine Stores/Vendors for Health Services by Residents of Ovia North East Local Government Area, Edo State.

PROCEDURES AND PROTOCOL INVOLVED IN THE STUDY

You are kindly requested to complete a questionnaire designed to assess the Utilisation of Patent Medicine Stores/Vendors for Health Services By Residents of Ovia North East Local Government Area, Edo State. This questionnaire is for research purposes only.

CONFIDENTIALITY

All information collected would be kept confidential and stored securely. Data collected would he anonymized and only accessible to the research team.

COMPENSATION

Participants will not receive any compensation for their participation.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. You may withdraw from the study at any time without any consequences.

RISKS

There are no risks associated with participation in this study.

BENEFITS

The information you provide will help us better understand how the utilisation of patent medicine stores/vendors for health services affects healthcare delivery to residents of Ovia North East Local Government Area.This can help raise awareness and may inform future policies, support services, and community education efforts aimed at improving healthcare delivery.

CONTACT INFORMATION

If you have any questions or concerns regarding this research work please contact:

ATAMEWAN SARAH ESEOSA

Medical Student

Email: sarah.atamewan@med.uniben.edu

Phone Number: 09052646545

AWO-OSAGIE AISOSA ANDREW

Medical Student

Email: awoaisosa@yahoo.com

Phone Number: 08148313354

OR

Ethics and Research Committee,

University of Benin Teaching Hospital,

Benin City.

Email: ubthresearchethics@gmail.com

Phone number: 07063331337

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

Please, sign below if you have agreed to participate in the study.

CERTIFICATION OF CONSENT

I,_____ having full capacity to consent for myself do thereby consent to my participation in the research study.

The methods and means by which the study will be conducted have been explained to me by Ethical Committee. I have been given the opportunity to ask questions concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Participant's Signature:_____

Date:_____

APPENDIX 2

QUESTIONNAIRE
UTILISATION OF PATENT MEDICINE STORES/VENDORS FOR HEALTH SERVICES BY RESIDENTS OF OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE

Dear respondent,

We are final-year medical students currently doing our one-year project to assess Utilisation of Patent Medicine Stores/Vendors for Health Services by residents of Ovia North East Local Government Area, Edo State. All information provided will be kept confidential.

PLEASE NOTE: This questionnaire asks about your knowledge and personal experience of utilisation of patent medicine stores/ vendors for health services. Please kindly answer all questions as accurately as possible. There are no right or wrong answers, and there is no penalty for opting out of the study at any time. Be assured that every information given to us will be treated with utmost confidentiality. DO NOT WRITE YOUR NAME, AS YOUR RESPONSE WILL REMAIN ANONYMOUS, THANK YOU.

DATE: _____

SECTION A: SOCIODEMOGRAPHIC CHARACTERISTICS

INSTRUCTION: Answer all questions correctly. Please tick one answer only

1. Age (in years, as at last birthday): ……..
2. Gender: Male ( ) Female ( )
3. Marital status: Single ( ) Cohabiting ( ) Married ( ) Divorced ( ) Widowed ( ) Separated ( )
4. Tribe: Benin ( ) Esan ( ) Igbo ( ) Yoruba ( ) Hausa ( ) Etsako ( ) Owan ( ) Urhobo ( ) Others ( )
5. Religion: Christianity ( ) Islam ( ) African Traditional Religion ( ) Others ( )
6. Level of Education: No formal education ( ) Primary ( ) Secondary ( ) Tertiary ( )
7. Occupation: .....
8. Monthly income: <₦70,000 ( ) ₦70,000-₦150,000 ( ) ₦150,000-₦300,000 ( ) >₦300,000 ( )
9. Have you patronized a patent medicine store/vendor within the last 12 months?: Yes ( ) No ( )

SECTION B: TYPES OF HEALTH SERVICES UTILISED IN PATENT MEDICINE STORES.

Instruction: For each of the items below, please indicate how often you have utilised the following services at a patent medicine store in the past 12 months.

Health Service / Condition	**Never**	**Once**	**A few times**	**Often**
Malaria treatment/antimalarials				
Fever (general) symptoms				
Cough/cold or respiratory symptoms				
Diarrhoea treatment / ORS				
Headache or pain relief (analgesics)				
Family planning products (condoms, pills)				
Reproductive health advice				

Treatment for STIs/sexual health concerns				
Treatment for skin problems				
Referral to a clinic/health facility				
Vaccination advice (non-administered)				
Nutrition or vitamin/mineral supplements				

SECTION C: PERCEIVED BENEFITS AND RISKS

Instruction: Please indicate your level of agreement with the following statements about patent medicine vendors.

Perceived Benefits	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
PMVs are closer to my home than other health facilities.					
Services at PMVs are cheaper than at clinics or hospitals.					
I can get medicine quickly without waiting a long time.					
PMVs are available even when health centers are closed.					
I trust the advice given by vendors about medicine use.					
I usually recover after treatment from a PMV.					
PMVs help meet my family's basic health needs.					

Perceived Risks	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
PPMVs often sell medicines without proper prescriptions.					
The medicines from PPMVs may be of poor quality or expired.					
PPMVs do not have sufficient training to treat health problems.					
I sometimes have to go to a hospital afterward because medicine didn't work.					
PPMVs sometimes give the wrong dose or incorrect advice.					
I worry about side effects from medicines bought at PPMVs.					

Using PPMVs may delay proper medical care.					

SECTION D: DETERMINANTS OF UTILISATION OF PATENT MEDICINE VENDORS

Instruction: Please indicate your level of agreement with the following statements about patent medicine vendors.

DETERMINANTS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The cost of services influences my decision to visit a PMV					
Flexible payment options (e.g paying on credit) affect my decision to use a PMV					
The proximity of the PMV to my home is important in deciding to visit					
The operating hours of PMV influence my decision to visit					
The distance I must travel to reach a PMV affects my utilization					
Family or friends' recommendations influence my decision to visit a PMV					
I trust PMVs more than formal healthcare facilities					
The knowledge and skill of the PMV affects my decision to use their service					
The availability of medicines at the PMV influences my decision					
Previous positive experiences with a PMV influence my decision to return					

SECTION E: SATISFACTION WITH PMV SERVICES

28. How satisfied are you with the services provided by PMVs?. Very satisfied ( ) Satisfied ( ) Neutral ( ) Dissatisfied ( ) Very dissatisfied ( )

29.How likely are you to continue using PMVs for health services? Very likely ( ) Likely ( ) Neutral ( ) Unlikely ( ) Very Unlikely ( )

30. Would you recommend PMVs to others? Yes ( ) No ( )

APPENDIX 3

ETHICAL CLEARANCE FORM

HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

P.M.B. 1111 BENIN CITY NIGERIA Telephone: 052-600418 Website: ubth.org

CHIEF MEDICAL DIRECTOR Prof. (Mrs) I.N Ize-Iyamu

DIRECTOR OF ADMINISTRATION Jim Uwadie, Esq

CHAIRMAN Prof. (Mrs.) Antoinette N. Ofili

HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number: NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486549127[illegible]

PROPOSAL TITLE: "UTILIZATION OF PATENT MEDICINE STORES/VENDORS FOR HEALTH SERVICES BY RESIDENTS OF OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE"

PRINCIPAL INVESTIGATOR(S): SARAH ESEOSA ATAMEWAN, AISOSA ANDREW AWO-OSAGIE

DEPARTMENT/INSTITUTION: DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

DATE CONSIDERED: MARCH 18TH, 2026

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 18/03/2026 TO 17/03/2027. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

UNIVERSITY OF BENIN TEACHING HOSPITAL ETHICS & RESEARCH COMMITTEE Date..... BENIN CITY P.M.

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE Sign 18/3/2026

SUPERVISOR (S): PROF V. Y. ADAM

DECLARATION BY INVESTIGATOR(S):

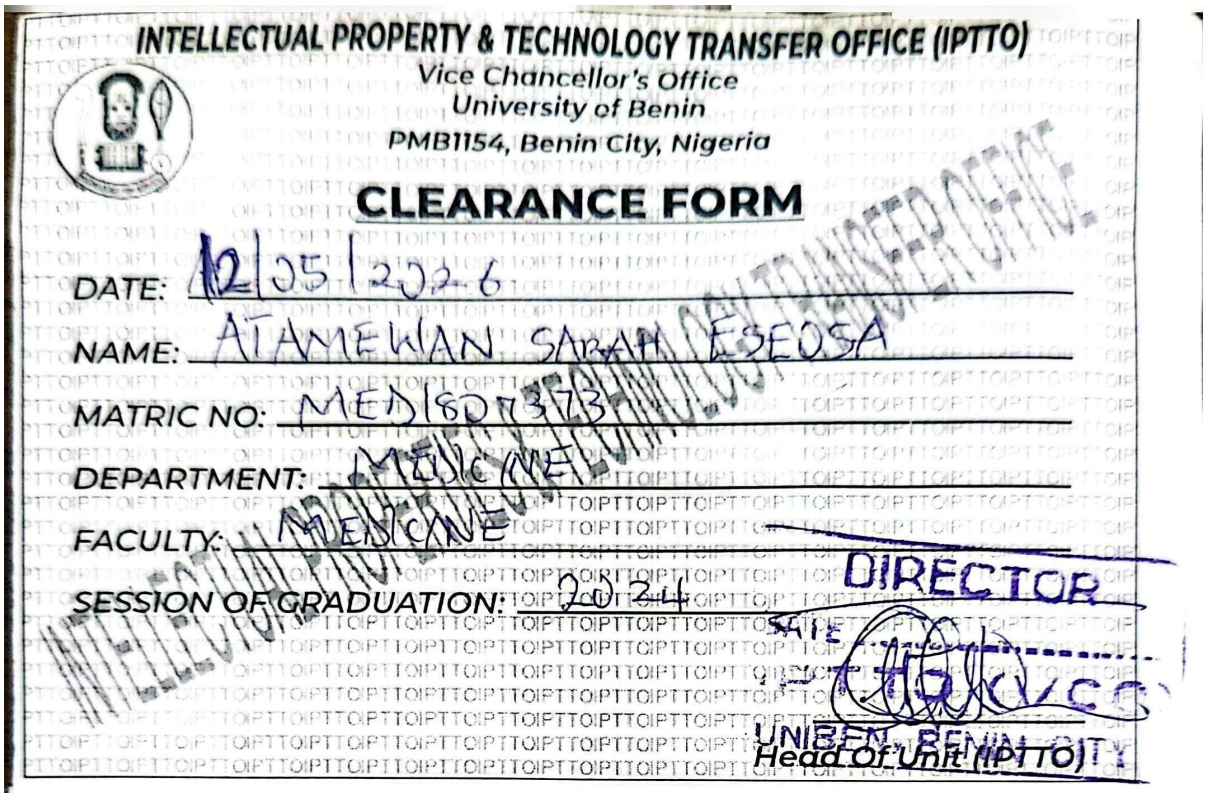
PROTOCOL NUMBER (please quote in all enquiries)

Note that no participant accrual or activity related to this research may be conducted outside of these dates and **you are to furnish the committee with the research activities at the completion of the study**. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification.

Signature & Date.....

APPENDIX 4

PLAGIARISM TEST

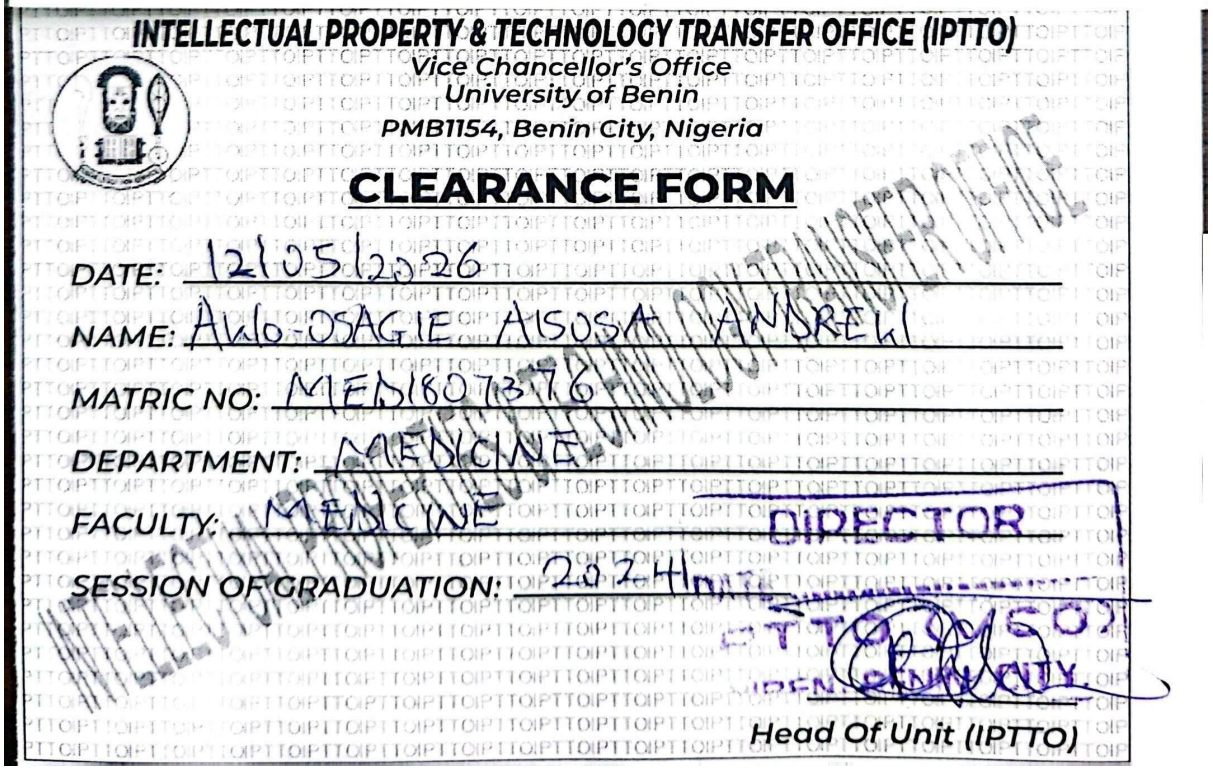


INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 12/05/2026
NAME: ATAMEWAN SARAH ESEOSA
MATRIC NO: MED/18073/3
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2024

DIRECTOR
SIGN
UNIBEN, BENIN CITY
Head Of Unit (IPTTO)



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Vice Chancellor's Office
University of Benin
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CLEARANCE FORM

DATE: 12/05/2026
NAME: AWO-OSAGIE AISOSA ANISREAL
MATRIC NO: MED/18073/6
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2024

DIRECTOR
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Head Of Unit (IPTTO)