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Influence of Socio-Economic Factors on Self-Medication Practices among Health Workers in Selected Health Facilities in Akwa Ibom State, Nigeria

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ABSTRACT

Self-medication among health workers sits between professional competence and unsafe practice, and in Nigeria economic pressure widens that space. This study examined the influence of socio-economic factors on self-medication practices among health workers in selected health facilities in Akwa Ibom State, Nigeria. Five factors were examined: monthly income, health insurance coverage, education level, years of work experience and drug cost. A cross-sectional survey design was adopted. From a population of 8,224 health workers, a sample of 367 was determined with the Krejcie and Morgan formula and selected by multistage sampling. Data were collected with the Self-Medication Practices Questionnaire among Health Workers (Cronbach's $\alpha = 0.78$); 342 questionnaires were returned and usable (93.2%). Data were analysed with SPSS version 25.0 using frequencies, Chi-square and multivariable binary logistic regression at the 0.05 level. Self-medication in the preceding six months was reported by 75.7% of respondents, and over half of these had used antibiotics. Monthly income (Wald = 9.214, $p = 0.027$), health insurance coverage (Wald = 11.095, $p = 0.001$), education level (Wald = 21.709, $p < 0.001$) and drug cost (Wald = 11.175, $p = 0.004$) significantly influenced self-medication, whereas years of experience did not (Wald = 6.566, $p = 0.087$). Uninsured workers had 2.72 times the odds of insured workers, and those rating drug cost as high had 3.25 times the odds of those rating it low. Self-medication among health workers in Akwa Ibom State was shaped as much by money and access as by clinical knowledge.

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1. INTRODUCTION

Self-medication is the use of medicines to treat self-diagnosed symptoms or conditions without the guidance of a qualified prescriber, and it includes the reuse of old prescriptions and the sharing of drugs with relatives. It is not inherently harmful. When practised responsibly with over-the-counter products, it relieves pressure on overstretched health systems. However, irresponsible self-medication carries well-documented risks, including incorrect self-diagnosis, masking of serious disease, adverse drug reactions, drug interactions and, most consequentially, antimicrobial resistance (Ahmed et al., 2023; Otaigbe & Elikwu, 2023). According to the GBD 2021 Antimicrobial Resistance Collaborators (2024), bacterial resistance was associated with several million deaths worldwide, and sub-Saharan Africa carried a disproportionate share of that burden. Nigeria sits near the centre of this problem. Muoka et al. (2026), pooling 86 Nigerian studies, estimated a national self-medication prevalence of 67.8%, rising above 78% among occupational groups. Moreover, antibiotics, analgesics and antimalarials dominated the medicines used, while financial barriers and easy access to drugs emerged as leading drivers. Similar patterns appeared in population surveys conducted during and after the COVID-19 pandemic (Wegbom et al., 2021; Amuzie et al., 2022; Adeke et al., 2025).

Health workers form a distinctive group within this picture. They possess pharmacological knowledge, work beside dispensaries and pharmacies, and often feel competent to manage their own minor illnesses. As a result, self-medication among them is frequently higher than in the general population. Okoye et al. (2022) reported that higher income and being a pharmacist were associated with self-medication among Nigerian health professionals, while Tobin et al. (2023) documented a high prevalence among workers in a tertiary hospital in South-South Nigeria. In Ethiopia, Demsie et al. (2025) found that physicians were over twenty times more likely than laboratory staff to self-medicate with antibiotics. Thus, knowledge alone does not guarantee rational use; it can equally fuel overconfidence. The economic setting matters. Nigerian health workers operate in a system where out-of-pocket payment remains the dominant mode of financing care, health insurance coverage is thin, and salary delays and industrial disputes are recurrent (Obembe et al., 2021; Onah et al., 2022). Even though health workers are employees of the health sector, many are uninsured and still pay for consultations, investigations and prescribed drugs. Moreover, the price of medicines has risen sharply with currency depreciation, so the cost of a full prescription can exceed the cost of buying a few tablets directly (Muoka et al., 2026). In addition, heavy workloads leave little time for formal consultation, and years spent in practice build the familiarity that makes self-treatment feel routine. These conditions suggest that income, insurance, education level, years of experience and drug cost could shape self-medication independently of clinical knowledge.

Statement of the Problem

Most Nigerian research on self-medication has focused on students, pregnant women and community residents (Akande-Sholabi et al., 2021; Edet et al., 2023; Akande-Sholabi & Akinyemi, 2023). Studies among health workers exist, yet they have concentrated on prevalence, drug patterns and knowledge, with socio-economic variables treated as background descriptors rather than as the object of inquiry (Jabbo et al., 2023; Ojo et al., 2024). Consequently, the extent to which income, insurance status, education level, years of experience and the cost of drugs influence self-medication among health workers remains unclear. In Akwa Ibom State, no published study has examined these factors together across tertiary, secondary and primary facilities. This gap matters because health workers model medicine-use behaviour for patients, and their own irrational use undermines antimicrobial

stewardship. Without evidence on the economic drivers, interventions are likely to rely on education alone and miss the structural pressures behind the behaviour.

Research Objectives

The general objective was to examine the influence of socio-economic factors on self-medication practices among health workers in selected health facilities in Akwa Ibom State. The specific objectives were to:

1. Determine the influence of monthly income on self-medication practices among health workers in Akwa Ibom State.
2. Examine the influence of health insurance coverage on self-medication practices among health workers in Akwa Ibom State.
3. Assess the influence of education level on self-medication practices among health workers in Akwa Ibom State.
4. Ascertain the influence of years of work experience on self-medication practices among health workers in Akwa Ibom State.
5. Determine the influence of drug cost on self-medication practices among health workers in Akwa Ibom State.

Research Questions

The following questions guided this study:

1. What is the influence of monthly income on self-medication practices among health workers in Akwa Ibom State?
2. What is the influence of health insurance coverage on self-medication practices among health workers in Akwa Ibom State?
3. What is the influence of education level on self-medication practices among health workers in Akwa Ibom State?
4. What is the influence of years of work experience on self-medication practices among health workers in Akwa Ibom State?
5. What is the influence of drug cost on self-medication practices among health workers in Akwa Ibom State?

Research Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

$H0_1$: Monthly income has no significant influence on self-medication practices among health workers in Akwa Ibom State.

$H0_2$: Health insurance coverage has no significant influence on self-medication practices among health workers in Akwa Ibom State.

$H0_3$: Education level has no significant influence on self-medication practices among health workers in Akwa Ibom State.

$H0_4$: Years of work experience have no significant influence on self-medication practices among health workers in Akwa Ibom State.

$H0_5$: Drug cost has no significant influence on self-medication practices among health workers in Akwa Ibom State.

2. LITERATURE REVIEW

Self-Medication

Self-medication has been defined in several overlapping ways. At its narrowest, it refers to the purchase and use of over-the-counter medicines for self-recognised symptoms. At its broadest, it covers the use of prescription-only medicines without prescription, the reuse of leftover drugs, the modification of prescribed doses and the sharing of medicines within households (Ahmed et al., 2023). Most recent studies adopt the broader view because, in low- and middle-income countries, the boundary between prescription-only and over-the-counter products is weakly enforced (Torres et al., 2021; Yeika et al., 2021). Antibiotics, which should never be obtained without prescription, are therefore routinely bought from patent medicine vendors and community pharmacies across Nigeria (Okafor et al., 2024). The literature distinguishes responsible from irresponsible self-medication. Responsible self-medication involves safe, effective, approved products used for minor, self-limiting conditions, with appropriate information. Irresponsible self-medication, by contrast, includes antibiotic use for viral infections, incomplete courses, excessive analgesic use and treatment of symptoms that warrant investigation. According to Otaigbe and Elikwu (2023), the second category is a principal driver of inappropriate antibiotic use in low- and middle-income settings. Sun et al. (2022), in a mixed-methods meta-analysis, further showed that non-biomedical factors such as cost, convenience and prior experience shape antibiotic use as strongly as clinical need. Prevalence estimates vary widely, largely because recall periods and definitions differ. Behzadifar et al. (2020) reported a pooled prevalence of about 70% among university students worldwide. During the COVID-19 pandemic, Kazemioula et al. (2022) estimated a global pooled prevalence of roughly 44%, while Quincho-Lopez et al. (2021) and Zheng et al. (2023) documented widespread use of ivermectin, azithromycin, hydroxychloroquine and vitamin supplements without medical advice. In Nigeria, Muoka et al. (2026) placed the pooled figure at 67.8%, with the highest levels among occupational groups and in workplace settings. Hence, self-medication is not a marginal behaviour in Nigeria; it is the norm.

Self-Medication among Health Workers

Health workers are exposed to the same illnesses as the public, yet they differ in knowledge, access and professional identity. Their proximity to medicines lowers the practical barriers to self-treatment. Their training gives them confidence in diagnosis and dosing. Furthermore, a professional culture that values resilience can discourage them from presenting as patients. As a result, several studies report higher self-medication among health workers than among the general population. In Kenya, Onchonga et al. (2020) reported that self-medication among health workers rose from about 36% before the COVID-19 pandemic to 60% during it. In Ethiopia, Fekadu et al. (2020) found a prevalence above 70% among health professionals in western hospitals, and Mohammed et al. (2021) reported a comparable level at Debre Markos. Demsie et al. (2025) found that 57.6% of health professionals in two tertiary hospitals in Bahir Dar had self-medicated with antibiotics in the preceding six months. In Spain, Cotobal-Calvo et al. (2025) showed that self-medication is equally common among health professionals in a high-income setting with universal coverage, which suggests that access to free care does not eliminate the behaviour. Nigerian evidence follows the same

direction. Okoye et al. (2022) surveyed health professionals during the pandemic and found that older age, being a pharmacist, higher income and prior COVID-19 testing were associated with self-medication. Aitafo et al. (2022) reported similar patterns among health workers in southern Nigeria. Tobin et al. (2023) documented a high prevalence among staff of a tertiary hospital in South-South Nigeria, while Jabbo et al. (2023) reported comparable findings in the North-East. In addition, Ojo et al. (2024) found that 30% of health workers in a federal teaching hospital in the South-West had self-medicated with antibiotics, even though most had good knowledge of antimicrobial resistance. Emeagha and Chika (2023) went further and documented complications arising from self-medication among workers at a federal medical centre in Imo State. These findings reveal a paradox. Knowledge of pharmacology is expected to discourage unsafe practice, yet it often coexists with high self-medication. Demsie et al. (2025) found that poor attitude, rather than poor knowledge, predicted antibiotic self-medication after adjustment. Chukwu et al. (2021) similarly reported gaps between awareness of antimicrobial resistance and prescribing behaviour among Nigerian health workers. Thus, knowledge is necessary but insufficient, and attention must shift to the structural and economic conditions that surround decision-making.

Socio-Economic Factors and Health-Seeking Behaviour

Socio-economic status is a composite of income, education, occupation and access to resources. It shapes health behaviour through several routes: the ability to pay for care, the opportunity cost of time, access to information and the sense of control over one's health. In health-seeking research, socio-economic factors typically operate as enabling or constraining conditions. Lederle et al. (2021), reviewing applications of Andersen's behavioural model, noted that income, insurance and education are among the most frequently examined enabling factors in health-service use. In Nigeria, these factors take a specific form. Out-of-pocket spending remains the main source of health financing, and catastrophic expenditure is common even among urban households (Obembe et al., 2021). The National Health Insurance Authority Act (2022) sought to make coverage mandatory, yet enrolment in formal schemes remains limited, particularly at state and local government levels. Moreover, the emigration of doctors and nurses has intensified workloads for those who remain (Onah et al., 2022). Under these conditions, a health worker with a fever may weigh the cost and time of consultation against the ease of taking an antimalarial from the ward stock or a nearby pharmacy. The relevance of socio-economic factors to self-medication has been confirmed in several contexts. Chautrakarn et al. (2021) linked income and education with over-the-counter self-medication in metropolitan Thailand. Rathod et al. (2023) found that cost of consultation and prior experience drove self-medication in central India. In Nigeria, Wegbom et al. (2021) showed that socio-economic characteristics predicted self-medication for COVID-19 prevention, and Edet et al. (2023) linked income and education with self-medication among pregnant women in Port Harcourt. However, few studies have isolated these factors among health workers.

Monthly Income and Self-Medication

The relationship between income and self-medication is not linear, and the literature contains two competing explanations. The first holds that low income drives self-medication because workers cannot afford consultation fees, laboratory tests and full prescriptions. Tesfamariam et al. (2019) found that cost of care was a leading reason for self-medication in Asmara, and Rathod et al. (2023) reported similar findings in India. Makeri et al. (2025), pooling Ugandan studies, identified financial constraints as one of the most consistent drivers. The second explanation holds that higher income enables self-medication because it allows workers to buy medicines directly without waiting for subsidised care. Okoye et al. (2022) reported that

self-medication among Nigerian health professionals rose steadily with annual income, from under 18% in the lowest band to about 66% in the highest. In the same vein, Alduraibi and Altowayan (2022) linked higher family income with self-medication among medical and pharmacy students in Saudi Arabia. On the other hand, Akande-Sholabi et al. (2021) found no clear income gradient among Nigerian undergraduate health students. These positions are reconcilable. Low income may push workers towards self-medication by making formal care unaffordable, while higher income may pull them towards it by making direct purchase easy. The net effect, therefore, depends on the price of formal care relative to medicines and on the availability of employer-supported care. This ambiguity justifies an empirical test in a setting such as Akwa Ibom State, where salary scales differ sharply across tertiary, secondary and primary facilities.

Health Insurance Coverage and Self-Medication

Health insurance reduces the direct cost of formal care and should, in principle, reduce reliance on self-medication. Evidence from several settings supports this. Ghasemyani et al. (2022), in a global meta-analysis, observed higher self-medication prevalence in regions with weaker financial protection. Yeika et al. (2021) found that lack of insurance and high consultation costs were recurrent determinants of antibiotic self-medication across African studies. In Ethiopia, Demsie et al. (2025) reported that cost-effectiveness was cited by nearly a quarter of health professionals as a reason for self-medicating with antibiotics. Nevertheless, insurance does not automatically change behaviour. Cotobal-Calvo et al. (2025) found high self-medication among Spanish health professionals despite universal coverage, which points to convenience and professional confidence as independent drivers. In Nigeria, the picture is complicated by the design of existing schemes. Enrolees often face long queues, restricted provider lists and copayments for medicines, so the effective price of insured care may remain high. According to Muoka et al. (2026), expanding health insurance coverage is central to curbing inappropriate self-medication, yet empirical evidence linking insurance status to self-medication among Nigerian health workers is scarce.

Education Level and Self-Medication

Education shapes both the knowledge and the confidence that underpin self-medication. Among the general public, higher education is usually associated with more self-medication with over-the-counter products and, in some studies, with more appropriate use (Chautrakarn et al., 2021). Among health workers, however, education interacts with professional role. Demsie et al. (2025) found that degree holders, master's graduates and specialist physicians were far more likely to self-medicate with antibiotics than diploma holders, with adjusted odds ratios above twenty. Similarly, Kifle et al. (2021) reported that higher academic year was associated with self-medication among Ethiopian health sciences students. Conversely, other studies suggest that education promotes caution. Popoola et al. (2024), surveying Nigerian graduates nationally, found that knowledge of antibiotic resistance was associated with lower self-medication with antibiotics. Chukwu et al. (2021) similarly linked training with better awareness among health workers. Hence, education appears to work in two directions: it improves awareness of risk while also increasing confidence in self-management. Among health workers, the second effect often dominates because advanced training confers both prescribing knowledge and professional authority.

Years of Work Experience and Self-Medication

Years of experience capture accumulated clinical exposure, familiarity with common illnesses and seniority within the workplace. Experience is expected to raise confidence in self-diagnosis and to widen informal access to medicines through colleagues and ward stock.

Okoye et al. (2022) found that Nigerian health professionals aged above 44 years, who were largely the most experienced, had nearly three times the odds of self-medicating compared with younger colleagues. In the same direction, Demsie et al. (2025) linked seniority markers, such as specialist status and higher degrees, with antibiotic self-medication among Ethiopian health professionals. However, experience is closely bound up with age, income and education, and its independent effect is uncertain. Once these correlates are held constant, experience may add little explanatory power. Mohammed et al. (2021) and Fekadu et al. (2020) reported self-medication across all experience bands among Ethiopian health workers, which suggests that the habit forms early in professional life. Hence, whether experience itself influences self-medication, or merely travels with the factors that do, remained an open question for this study.

Drug Cost and Self-Medication

Drug cost refers to the price health workers pay, or perceive they would pay, for medicines obtained through a formal prescription. In Nigeria, medicine prices rose steeply after the currency devaluations of 2023 and 2024, and prescribed treatment typically includes consultation, investigations and a full course of drugs. Self-medication allows the worker to buy only the tablets considered necessary, often in smaller quantities, which makes it appear cheaper. According to Muoka et al. (2026), financial barriers were among the major drivers of self-medication across Nigerian studies. Evidence from other settings supports this link. Tesfamariam et al. (2019) found that the cost of formal care was a leading reason for self-medication in Asmara, and Rathod et al. (2023) reported similar findings in central India. Yeika et al. (2021) identified high treatment costs as a recurrent determinant of antibiotic self-medication across Africa, while Demsie et al. (2025) found that nearly a quarter of health professionals cited cost-effectiveness as their reason for self-medicating with antibiotics. Furthermore, Ahmed et al. (2023) listed cost among the most consistent determinants in their meta-analysis. Nevertheless, drug cost among health workers has rarely been measured directly as an independent variable, which left its influence untested in the Nigerian workforce.

2.2 Theoretical Framework

Two theories anchored this study: Andersen's Behavioural Model of Health Services Use and the Health Belief Model. A third perspective, Grossman's demand for health model, provided an economic lens on the trade-off between formal care and self-treatment.

Andersen's Behavioural Model of Health Services Use

Andersen's model explains health service use as a function of predisposing, enabling and need factors. Predisposing factors include age, gender, education and health beliefs. Enabling factors include income, insurance and access to services. Need factors refer to perceived and evaluated illness. Lederle et al. (2021) showed that the model has been widely applied to explain both the use and the avoidance of formal care, and it has been extended to self-care behaviours. The model fits this study closely. Monthly income and insurance coverage are classic enabling factors, while educational qualification is a predisposing factor. For health workers, access to medicines within the workplace acts as an additional enabling factor that favours self-medication over formal consultation. Therefore, the model predicts that workers with weaker financial access to formal care, or with stronger access to medicines, will self-medicate more often. Its limitation lies in its treatment of behaviour as largely determined by structural conditions, with limited attention to individual perceptions of risk.

Health Belief Model

The Health Belief Model explains health behaviour through perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. According to Alyafei and Easton-Carr (2024), the model remains one of the most widely used frameworks for explaining preventive and treatment-seeking behaviour. In the context of self-medication, a health worker who perceives an illness as minor, perceives high barriers to formal care such as cost and waiting time, and has strong self-efficacy in managing symptoms is likely to self-medicate. This model complements Andersen's framework. Whereas Andersen explains the structural conditions, the Health Belief Model explains how those conditions are perceived. Income and insurance translate into perceived barriers; education translates into self-efficacy. Bosnjak et al. (2020), discussing the related theory of planned behaviour, similarly emphasised perceived behavioural control as a key predictor of action. Thus, the combination of both models explains why knowledgeable health workers may still choose self-medication.

Grossman's Demand for Health Model

Grossman's model treats health as a durable capital stock that individuals invest in through medical care and time. Its central insight for this study is the opportunity cost of time. Health workers on long shifts face high time costs for formal consultation, particularly when they are also providers in the same facility. Self-medication becomes a low-cost substitute for formal care when consultation fees, waiting time and lost income are high. Therefore, the model predicts that the relative price of formal care, shaped by income and insurance, influences the choice between self-treatment and consultation.

2.3 Conceptual Framework

The conceptual framework (Figure 1) links five socio-economic factors to self-medication practice. Monthly income, health insurance coverage and drug cost act through financial access to formal care, while education level and years of experience act through knowledge and self-efficacy. Workplace access to medicines is shown as a contextual factor that lowers the practical barrier to self-treatment for all categories of workers.

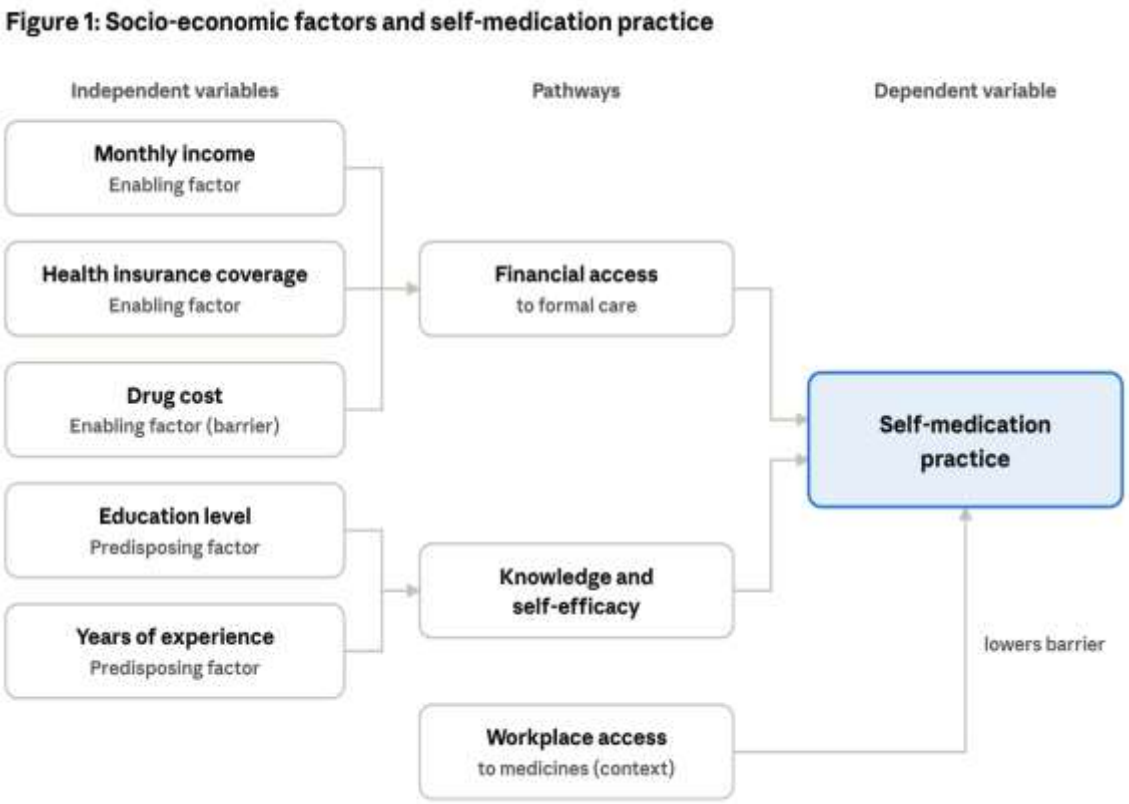

Figure 1: *Conceptual framework of the study*. **Source:** *Researcher's conceptualisation (2026), adapted from Andersen's Behavioural Model (Lederle et al., 2021) and the Health Belief Model (Alyafei & Easton-Carr, 2024).*

2.4 Review of Related Empirical Studies

Okoye et al. (2022) conducted a cross-sectional study of health care professionals in Nigeria during the COVID-19 pandemic. Self-medication was reported by about 40% of respondents, and ivermectin, azithromycin, vitamin C and zinc were the most commonly used products. Older age, being a pharmacist and higher income were significantly associated with self-medication, while age above 44 years and prior COVID-19 testing emerged as independent predictors. The study is relevant because it directly linked income with self-medication among Nigerian health workers, although it was conducted during a pandemic when self-medication was unusually high.

Tobin et al. (2023) examined self-medication among health workers in a tertiary hospital in South-South Nigeria. The study reported a high prevalence and identified analgesics and antimalarials as the leading drugs. Perceived mildness of illness and time constraints were the main reasons. The study shares a geopolitical zone with the present work, yet it was limited to a single tertiary facility and did not examine insurance status.

Ojo et al. (2024) studied 320 health workers in a federal teaching hospital in the South-West using a two-stage sampling technique. Most respondents had good knowledge of antibiotic use and resistance, yet only 39.4% had positive attitudes, and 30% had self-medicated with antibiotics. The study used logistic regression, and its findings reinforce the gap between knowledge and practice among Nigerian health workers.

Jabbo et al. (2023) assessed the prevalence and pattern of self-medication among health workers in a tertiary hospital in North-East Nigeria. Self-medication was common, and

analgesics and antimalarials dominated. Emeagha and Chika (2023), working in Imo State, reported that workers in a federal medical centre experienced complications including gastric irritation and drug reactions after self-medication. Aitafo et al. (2022) surveyed health workers in southern Nigeria during the pandemic and reported frequent use of antibiotics and supplements for COVID-19 prevention.

Demsie et al. (2025) studied 410 health professionals in two tertiary hospitals in Bahir Dar, Ethiopia. The prevalence of antibiotic self-medication was 57.6%. Ease of access (36%), cost-effectiveness (23%) and professional knowledge (22%) were the main reported drivers. After adjustment, physicians, pharmacists, degree holders, master's graduates and specialists were significantly more likely to self-medicate, and poor attitude remained a significant determinant. The study provides strong evidence that higher education increases self-medication among health workers.

Mohammed et al. (2021) investigated self-medication among health care professionals at Debre Markos Comprehensive Specialized Hospital in Ethiopia and reported a prevalence above 70%. Fekadu et al. (2020) found a similar level among health professionals in western Ethiopia, with perceived mildness of illness and financial constraints among the leading reasons. Both studies confirmed that self-medication among health workers in sub-Saharan Africa is the rule rather than the exception.

Onchonga et al. (2020) compared self-medication among Kenyan health workers before and during the COVID-19 pandemic. Prevalence rose markedly during the pandemic, driven by fear of infection, stigma and difficulty accessing care. The study is relevant because it shows that barriers to formal care, rather than knowledge, shifted behaviour.

Cotobal-Calvo et al. (2025) surveyed health professionals in Spain and found that self-medication was widespread despite universal coverage. Analgesics and anti-inflammatory drugs were the most frequently used. Professional confidence and convenience were central explanations. The study offers a useful contrast with Nigeria, where financial barriers are higher.

Among non-health populations in Nigeria, Wegbom et al. (2021) conducted a national population survey and found that socio-economic characteristics, including education and income, were associated with self-medication for COVID-19. Adeke et al. (2025) studied adults in Abakaliki and linked health-seeking behaviour and economic factors to antibiotic self-medication. Akande-Sholabi and Akinyemi (2023) found high over-the-counter self-medication among consumers in a south-western state. Popoola et al. (2024) reported that knowledge of antibiotic resistance among graduates was associated with lower antibiotic self-medication. Edet et al. (2023) linked income and education with self-medication among pregnant women in urban tertiary hospitals.

At the regional level, Yeika et al. (2021) compared antibiotic self-medication across Africa and identified cost of care, lack of insurance and easy availability as common determinants. Torres et al. (2021) estimated the use of non-prescribed antibiotics across low- and middle-income countries and highlighted weak regulation. Ahmed et al. (2023), in a systematic review and meta-analysis, found that lower income, lack of insurance and previous experience were among the most consistent determinants of antibiotic self-medication.

On the cost dimension, Rathod et al. (2023) conducted a community-based study in central India and found that the expense of consulting a doctor and buying prescribed drugs was a leading reason for self-medication. Tesfamariam et al. (2019), working in pharmacy outlets in Asmara, reported that cost of care and previous experience with the same illness drove risky

over-the-counter use. Makeri et al. (2025), in a meta-analysis of Ugandan studies, identified financial constraints as one of the most consistent drivers. Together, these studies suggest that the relative price of formal treatment is a central determinant, although none measured it among health workers.

3. RESEARCH METHODOLOGY

Research Design

The study adopted a cross-sectional survey design. This design allowed data on the socio-economic characteristics and self-medication practices of health workers to be collected systematically at a single point in time and analysed for relationships among variables. The study was conducted in Akwa Ibom State, in the South-South geopolitical zone of Nigeria. The state comprised thirty-one Local Government Areas with urban and rural populations and a network of tertiary, secondary and primary health facilities. Tertiary care was provided by the University of Uyo Teaching Hospital and Ibom Specialist Hospital, while general hospitals in the Local Government Areas provided secondary care. Primary health care centres and community health posts delivered primary care. In addition, private hospitals, clinics, community pharmacies and patent medicine outlets were widely distributed across the state. These facilities employed doctors, nurses, pharmacists, medical laboratory scientists, radiographers, community health officers, community health extension workers and other allied professionals. The spread of facilities across the three senatorial districts, together with marked differences in salary structures across levels of care, made the state suitable for examining the influence of socio-economic factors on self-medication.

Population and Sampling

The population comprised all health workers employed in the public health sector of Akwa Ibom State. Records obtained from the Akwa Ibom State Ministry of Health and the Akwa Ibom State Local Government Service Commission put the total at 8,224 health workers across the three levels of care. The target population included doctors, nurses, pharmacists, medical laboratory scientists, community health officers, community health extension workers and other allied professionals directly involved in service delivery. However, the sample size was determined using the Krejcie and Morgan (1970) formula for finite populations:

$$S = \frac{X^2 NP(1 - P)}{d^2(N - 1) + X^2 P(1 - P)}$$

where S was the required sample size, X^2 was the table value of chi-square for one degree of freedom at the 0.05 level (3.841), N was the population size (8,224), P was the population proportion (0.50) and d was the degree of accuracy (0.05). Substituting the values:

$$S = \frac{3.841 \times 8224 \times 0.5(1-0.5)}{0.05^2(8224-1) + 3.841 \times 0.5(1-0.5)}$$

$$S = \frac{3.841 \times 8224 \times 0.25}{0.0025(8224-1) + 0.96025}$$

$$S = \frac{7899.94}{21.51775}$$

$$S \approx 367$$

The sample size was therefore 367 health workers. A multistage sampling technique was used. In the first stage, health facilities were clustered by level of care into tertiary, secondary and primary facilities. In the second stage, the two tertiary institutions, the University of Uyo Teaching Hospital and Ibom Specialist Hospital, were selected purposively. The state was then stratified into its three senatorial regions (North-East, North-West and South), and two secondary facilities and two primary health care centres were selected from each region by simple random sampling. This produced twelve secondary and primary facilities in addition to the two tertiary institutions. The sample was allocated proportionately to staff strength: 147 respondents in the North-East, which hosted both tertiary institutions, and 110 each in the North-West and South. In the third stage, respondents were selected from staff lists in each facility by balloting without replacement, so that every eligible worker had an equal chance of selection. In total, 367 questionnaires were distributed.

Instrumentation

Data were collected with a researcher-developed structured questionnaire titled the Self-Medication Practices Questionnaire among Health Workers (SMPQ-HW), constructed after a review of related literature. The instrument had five sections. Section A captured socio-demographic and socio-economic characteristics, including age, sex, professional category, years of experience, facility level, net monthly income, health insurance status and highest educational qualification. Section B captured self-medication practice, including whether the respondent had used any medicine without a prescription in the preceding six months, the types of medicines used, frequency of use and conditions treated. Section C assessed knowledge of self-medication risks. Section D measured perceived influencing factors such as availability and accessibility of drugs, professional knowledge, cost of treatment and the cost of prescribed drugs. Section E assessed reasons for self-medication. Sections C, D and E used a five-point Likert scale: Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1).

For analysis, self-medication practice, the dependent variable, was coded as a binary outcome (1 = used at least one medicine without a prescription in the preceding six months; 0 = did not). The five independent variables were coded as follows. Monthly income was grouped into four bands (below ₦100,000; ₦100,000 to ₦199,999; ₦200,000 to ₦299,999; ₦300,000 and above). Health insurance was coded as enrolled or not enrolled in any scheme. Education level was grouped as diploma or certificate, first degree, postgraduate degree, and professional fellowship. Years of work experience were grouped as below 5 years, 5 to 10 years, 11 to 20 years, and above 20 years. Drug cost was measured with five Section D items on the perceived cost of prescribed medicines; the mean item score was classified as low (below 2.50), moderate (2.50 to 3.49) or high (3.50 and above). However, face and content validity were established by experts in public health, pharmacology and research methodology, who assessed the items for clarity, relevance and adequacy. Their corrections were incorporated into the final version of the instrument. A pilot study was conducted among thirty health workers in a public health facility outside the selected study facilities. Internal consistency was tested with Cronbach's alpha, which yielded a coefficient of 0.78. This indicated acceptable reliability.

Procedure for Data Collection

Data collection began after ethical approval and facility permissions had been obtained. An introductory letter from the Department was presented to the management of each facility. Three research assistants, trained on the objectives of the study, ethical requirements and questionnaire administration, assisted the researcher. Questionnaires were delivered by hand

during working hours in duty units and offices. The purpose of the study was explained, and consenting workers received the instrument. Respondents were allowed twenty-four to forty-eight hours to complete it, after which the facilities were revisited for retrieval. Not all questionnaires were returned. Of the 367 distributed, 351 were retrieved, and nine were excluded because key items, including the self-medication outcome or income band, were left blank. Consequently, 342 questionnaires were analysed, giving a usable response rate of 93.2%. Thus, data were coded and analysed with the Statistical Package for the Social Sciences (SPSS) version 25.0. Frequencies, percentages, means and standard deviations summarised respondents' characteristics and patterns of self-medication. The research questions were answered with cross-tabulations, supported by Chi-square tests of association. Because the hypotheses concerned influence rather than association, they were tested with multivariable binary logistic regression, with all five socio-economic factors entered simultaneously. This allowed the influence of each factor to be estimated while holding the other four constant. Model adequacy was assessed with the omnibus test of model coefficients, the Cox and Snell and Nagelkerke R^2 values, the Hosmer and Lemeshow test and the classification accuracy. The joint Wald statistic for each factor was used to decide each hypothesis. All tests were conducted at the 0.05 level of significance.

4. ANALYSIS AND FINDINGS

Socio-Demographic and Socio-Economic Characteristics of Respondents

Table 2: Characteristics of Respondents (n = 342)

Variable	Category	Frequency	Percent (%)
Sex	Male	131	38.3
	Female	211	61.7
Age (years)	20 to 29	71	20.8
	30 to 39	128	37.4
	40 to 49	97	28.4
	50 and above	46	13.5
Professional category	Nurse or midwife	131	38.3
	Community health officer or extension worker	71	20.8
	Medical doctor	58	17.0
	Medical laboratory scientist	34	9.9
	Other allied professional	27	7.9
	Pharmacist	21	6.1
Facility level	Tertiary	128	37.4
	Secondary	118	34.5
	Primary	96	28.1

Variable	Category	Frequency	Percent (%)
Net monthly income	Below ₦100,000	39	11.4
	₦100,000 to ₦199,999	130	38.0
	₦200,000 to ₦299,999	118	34.5
	₦300,000 and above	55	16.1
Health insurance	Enrolled	106	31.0
	Not enrolled	236	69.0
Education level	Diploma or certificate	52	15.2
	First degree	121	35.4
	Postgraduate degree	123	36.0
	Professional fellowship	46	13.5
Years of experience	Below 5 years	84	24.6
	5 to 10 years	93	27.2
	11 to 20 years	117	34.2
	Above 20 years	48	14.0
Perceived drug cost	Low	71	20.8
	Moderate	115	33.6
	High	156	45.6

Source: *Field Survey, 2026*

Female workers made up 61.7% of respondents, reflecting the weight of nursing and midwifery (38.3%) in the public workforce. Most respondents were aged 30 to 49 years (65.8%), and a third (34.2%) had 11 to 20 years of experience. Income was concentrated in the middle bands, with 72.5% earning between ₦100,000 and ₦299,999. Only 31.0% were enrolled in any health insurance scheme, so most respondents paid for their own care out of pocket. Postgraduate holders (36.0%) and first-degree holders (35.4%) dominated the education profile. Nearly half (45.6%) rated the cost of prescribed drugs as high, and only a fifth (20.8%) considered it low. The sample therefore carried enough variation on all five factors to support the planned comparisons.

Prevalence and Pattern of Self-Medication

Table 3: Prevalence, Medicines Used and Sources of Self-Medication

Item	Category	Frequency	Percent (%)
Self-medicated in past six months (n = 342)	Yes	259	75.7
	No	83	24.3
Medicines used (n = 259; multiple responses)	Analgesics	218	84.2

Item	Category	Frequency	Percent (%)
	Antimalarials	184	71.0
	Antibiotics	137	52.9
	Vitamins and supplements	116	44.8
	Antacids	63	24.3
Main source of medicines (n = 259)	Facility pharmacy or ward stock	110	42.5
	Community pharmacy	102	39.4
	Patent medicine vendor	29	11.2
	Leftover medicines at home	18	6.9

Source: *Field Survey, 2026*

Self-medication in the six months preceding the survey was reported by 259 respondents (75.7%), so three in every four health workers had treated themselves without a prescription. Analgesics were the most frequently used medicines (84.2%), followed by antimalarials (71.0%). More than half of those who self-medicated (52.9%) had used antibiotics, which is the most concerning finding given the stewardship role expected of health workers. Vitamins and supplements (44.8%) and antacids (24.3%) followed. The facility pharmacy or ward stock was the leading source (42.5%), with community pharmacies close behind (39.4%). Hence, workplace access to medicines was a major channel, while only a minority relied on patent medicine vendors (11.2%) or leftover medicines (6.9%).

Research Question One: What is the influence of monthly income on self-medication practices among health workers in Akwa Ibom State?

Table 4: Self-Medication Practice by Net Monthly Income

Net monthly income	Self-medicated, n (%)	Did not self-medicate, n (%)	Total
Below ₦100,000	21 (53.8)	18 (46.2)	39
₦100,000 to ₦199,999	100 (76.9)	30 (23.1)	130
₦200,000 to ₦299,999	96 (81.4)	22 (18.6)	118
₦300,000 and above	42 (76.4)	13 (23.6)	55
Total	**259 (75.7)**	**83 (24.3)**	**342**

Source: *Field Survey, 2026.* $\chi^2 = 12.307$, $df = 3$, $p = 0.006$

Self-medication rose sharply once income passed the lowest band. Only 53.8% of workers earning below ₦100,000 had self-medicated, compared with 76.9% of those earning ₦100,000 to ₦199,999 and 81.4% of those earning ₦200,000 to ₦299,999. The highest earners (₦300,000 and above) recorded 76.4%, slightly below the band beneath them. The association was significant ($\chi^2 = 12.307$, df = 3, p = 0.006). The pattern is a threshold rather than a steady climb: the jump of 23.1 percentage points between the two lowest bands dwarfs every later difference. Workers who could afford to buy medicines directly did so, while the lowest earners were less able to purchase medicines at all.

Research Question Two: What is the influence of health insurance coverage on self-medication practices among health workers in Akwa Ibom State?

Table 5: Self-Medication Practice by Health Insurance Status

Health insurance status	Self-medicated, n (%)	Did not self-medicate, n (%)	Total
Enrolled	71 (67.0)	35 (33.0)	106
Not enrolled	188 (79.7)	48 (20.3)	236
Total	**259 (75.7)**	**83 (24.3)**	**342**

Source: *Field Survey, 2026.* $\chi^2 = 6.399$, $df = 1$, $p = 0.011$

Uninsured workers self-medicated more often than insured workers. Of the 236 respondents without insurance, 188 (79.7%) had self-medicated, compared with 71 of the 106 insured respondents (67.0%). The difference of 12.7 percentage points was significant ($\chi^2 = 6.399$, df = 1, p = 0.011). This is a substantial gap for a workforce that shares the same clinical knowledge and the same workplace access to medicines. Nevertheless, two in every three insured workers still treated themselves. Insurance therefore reduced self-medication without removing it, which indicates that financial protection lowered one barrier to formal care while convenience and professional confidence continued to sustain the behaviour.

Research Question Three: What is the influence of education level on self-medication practices among health workers in Akwa Ibom State?

Table 6: Self-Medication Practice by Education Level

Education level	Self-medicated, n (%)	Did not self-medicate, n (%)	Total
Diploma or certificate	29 (55.8)	23 (44.2)	52
First degree	84 (69.4)	37 (30.6)	121
Postgraduate degree	104 (84.6)	19 (15.4)	123
Professional fellowship	42 (91.3)	4 (8.7)	46
Total	**259 (75.7)**	**83 (24.3)**	**342**

Source: *Field Survey, 2026. $\chi^2 = 25.173$, df = 3, $p < 0.001$*

Self-medication climbed at every step of education. It stood at 55.8% among diploma and certificate holders, 69.4% among first-degree holders, 84.6% among postgraduate holders and 91.3% among fellowship holders. The association was the strongest of the five factors ($\chi^2 = 25.173$, df = 3, $p < 0.001$). The gradient spans 35.5 percentage points and never reverses. Higher qualifications bring prescribing authority, deeper pharmacological knowledge and greater autonomy. Consequently, the most highly trained workers were the most likely to manage their own illnesses without consultation, and only four of the 46 fellowship holders had not self-medicated. Education did not act as a brake on self-medication; it acted as an enabler.

Research Question Four: What is the influence of years of work experience on self-medication practices among health workers in Akwa Ibom State?

Table 7: Self-Medication Practice by Years of Work Experience

Years of experience	Self-medicated, n (%)	Did not self-medicate, n (%)	Total
Below 5 years	58 (69.0)	26 (31.0)	84
5 to 10 years	64 (68.8)	29 (31.2)	93
11 to 20 years	99 (84.6)	18 (15.4)	117
Above 20 years	38 (79.2)	10 (20.8)	48
Total	**259 (75.7)**	**83 (24.3)**	**342**

Source: *Field Survey, 2026. $\chi^2 = 9.793$, df = 3, $p = 0.020$*

Self-medication was similar among workers with below 5 years (69.0%) and 5 to 10 years (68.8%) of experience, then rose to 84.6% among those with 11 to 20 years before easing to 79.2% beyond 20 years. The bivariate association was significant ($\chi^2 = 9.793$, df = 3, p = 0.020). The pattern points to mid-career workers as the most frequent self-medicators. However, this group also held more postgraduate qualifications and earned more, so part of the apparent effect of experience may belong to education and income. Table 11 tests whether experience retained any influence once those factors were controlled. On its own, experience was linked to self-medication mainly after the first decade of practice.

Research Question Five: What is the influence of drug cost on self-medication practices among health workers in Akwa Ibom State?

Table 8: Self-Medication Practice by Perceived Drug Cost

Perceived cost of prescribed drugs	Self-medicated, n (%)	Did not self-medicate, n (%)	Total
Low	44 (62.0)	27 (38.0)	71
Moderate	89 (77.4)	26 (22.6)	115
High	126 (80.8)	30 (19.2)	156
Total	**259 (75.7)**	**83 (24.3)**	**342**

Source: *Field Survey, 2026.* $\chi^2 = 9.640$, *df = 2, p = 0.008*

Self-medication increased with the perceived cost of prescribed drugs. Workers who rated drug cost as low self-medicated at 62.0%, compared with 77.4% of those who rated it moderate and 80.8% of those who rated it high. The association was significant ($\chi^2 = 9.640$, df = 2, p = 0.008). The largest step (15.4 percentage points) occurred between low and moderate cost, which suggests that even a moderate price for a full prescription was enough to push workers towards buying only what they judged necessary. Since 45.6% of respondents rated drug cost as high, this factor affected the largest share of the workforce of any of the five examined.

Test of Hypotheses

The five hypotheses were tested with a multivariable binary logistic regression in which all five factors were entered together. The model's adequacy is summarised in Table 9, the coefficients in Table 10 and the hypothesis decisions in Table 11.

Table 9: Model Fit Summary for the Binary Logistic Regression (n = 342)

Statistic	Value
Omnibus test of model coefficients	$\chi^2 = 61.754$, df = 12, p < 0.001
−2 Log likelihood	317.292
Cox and Snell R^2	0.165
Nagelkerke R^2	0.247
Hosmer and Lemeshow test	$\chi^2 = 12.710$, df = 8, p = 0.122
Overall classification accuracy	79.5%

Source: *Field Survey, 2026*

The omnibus test was significant ($\chi^2 = 61.754$, df = 12, p < 0.001), so the five factors together predicted self-medication better than a model with no predictors. The Nagelkerke R^2 of 0.247 shows that the model explained about a quarter of the variation in self-medication, which is reasonable for a behavioural outcome shaped by many unmeasured influences such as illness type and attitude. The Hosmer and Lemeshow test was not significant ($\chi^2 = 12.710$, df = 8, p = 0.122), indicating that predicted and observed outcomes did not differ materially and the model fitted the data well. The model classified 79.5% of respondents correctly.

Table 10: Multivariable Binary Logistic Regression of Self-Medication on Socio-Economic Factors (n = 342)

Variable	Category	B	S.E.	Wald	p-value	Exp(B)	95% CI for Exp(B)
Monthly income	Below ₦100,000 (ref.)					1.00	
	₦100,000 to	0.959	0.436	4.843	0.028	2.61	1.11 to 6.13

Variable	Category	B	S.E.	Wald	p-value	Exp(B)	95% CI for Exp(B)
	₦199,999						
	₦200,000 to ₦299,999	0.874	0.472	3.421	0.064	2.40	0.95 to 6.05
	₦300,000 and above	−0.074	0.575	0.017	0.897	0.93	0.30 to 2.87
Health insurance	Enrolled (ref.)					1.00	
	Not enrolled	1.000	0.300	11.095	0.001	2.72	1.51 to 4.90
Education level	Diploma or certificate (ref.)					1.00	
	First degree	0.492	0.385	1.632	0.201	1.64	0.77 to 3.48
	Postgraduate degree	1.482	0.419	12.530	< 0.001	4.40	1.94 to 10.00
	Professional fellowship	2.494	0.679	13.494	< 0.001	12.11	3.20 to 45.82
Years of experience	Below 5 years (ref.)					1.00	
	5 to 10 years	−0.212	0.372	0.323	0.570	0.81	0.39 to 1.68
	11 to 20 years	0.720	0.411	3.063	0.080	2.05	0.92 to 4.60
	Above 20 years	0.447	0.522	0.736	0.391	1.56	0.56 to 4.35
Perceived drug cost	Low (ref.)					1.00	
	Moderate	0.943	0.376	6.296	0.012	2.57	1.23 to 5.37
	High	1.180	0.361	10.678	0.001	3.25	1.60 to 6.60
Constant		−2.098	0.594	12.455	< 0.001	0.12	

Source: *Field Survey, 2026. ref. = reference category; Exp(B) = adjusted odds ratio; CI = confidence interval*.

Table 11: Summary of Hypothesis Tests (Joint Wald Test for Each Factor)

Hypothesis	Factor	Wald χ^2	df	p-value	Decision
H01	Monthly income	9.214	3	0.027	Rejected
H02	Health insurance coverage	11.095	1	0.001	Rejected
H03	Education level	21.709	3	< 0.001	Rejected
H04	Years of work experience	6.566	3	0.087	Not rejected
H05	Drug cost	11.175	2	0.004	Rejected

Source: *Field Survey, 2026. Significance level $\alpha = 0.05$*.

H01: Monthly income has no significant influence on self-medication practices among health workers in Akwa Ibom State.

The joint Wald test for income was significant (Wald $\chi^2 = 9.214$, df = 3, p = 0.027). Since p was below 0.05, the null hypothesis was rejected. Hence, monthly income had a significant influence on self-medication among health workers in Akwa Ibom State, even after insurance, education, experience and drug cost were held constant. Table 10 locates the effect: workers earning ₦100,000 to ₦199,999 had 2.61 times the odds of self-medicating compared with those earning below ₦100,000 (B = 0.959, p = 0.028). The ₦200,000 to ₦299,999 band approached significance (p = 0.064), while the highest band did not differ from the reference (Exp(B) = 0.93, p = 0.897). Income therefore influenced self-medication mainly by lifting workers out of the lowest band.

H02: Health insurance coverage has no significant influence on self-medication practices among health workers in Akwa Ibom State.

The Wald test for insurance was significant (Wald $\chi^2 = 11.095$, df = 1, p = 0.001), so the null hypothesis was rejected. Health insurance coverage therefore had a significant influence on self-medication among health workers in Akwa Ibom State. The adjusted effect was stronger than the unadjusted gap in Table 5 suggested. With income, education, experience and drug cost held constant, uninsured workers had 2.72 times the odds of self-medicating compared with insured workers (B = 1.000; 95% CI: 1.51 to 4.90). The widening of the effect after adjustment reflects the fact that insured workers tended to earn more, and higher income on its own raised self-medication. Insurance, taken on its own terms, was clearly protective.

H03: Education level has no significant influence on self-medication practices among health workers in Akwa Ibom State.

The joint Wald test for education was the largest in the model (Wald $\chi^2 = 21.709$, df = 3, $p < 0.001$). Since p was well below 0.05, the null hypothesis was rejected. Education level therefore had a significant influence on self-medication among health workers in Akwa Ibom State. First-degree holders did not differ significantly from diploma holders (Exp(B) = 1.64, p = 0.201). However, postgraduate holders had 4.40 times the odds ($p < 0.001$) and fellowship holders 12.11 times the odds ($p < 0.001$) of self-medicating. The very wide interval for fellowship holders (3.20 to 45.82) reflects the small number of non-self-medicators in that group, yet even its lower limit indicates a strong effect.

H04: Years of work experience have no significant influence on self-medication practices among health workers in Akwa Ibom State.

The joint Wald test for experience was not significant (Wald $\chi^2 = 6.566$, df = 3, p = 0.087). Since p exceeded 0.05, the null hypothesis was not rejected. Years of work experience therefore had no significant independent influence on self-medication among health workers in Akwa Ibom State. This contrasts with the significant bivariate association in Table 7 (p = 0.020). The difference arises because experience travels with education and income: once those factors were controlled, the higher rate among workers with 11 to 20 years of experience shrank to a non-significant Exp(B) of 2.05 (p = 0.080). Experience appeared to matter only because experienced workers were better educated and better paid.

H05: Drug cost has no significant influence on self-medication practices among health workers in Akwa Ibom State.

The joint Wald test for drug cost was significant (Wald $\chi^2 = 11.175$, df = 2, p = 0.004), so the null hypothesis was rejected. Drug cost therefore had a significant influence on self-medication among health workers in Akwa Ibom State. Compared with workers who rated prescribed drugs as low in cost, those who rated them moderate had 2.57 times the odds of self-medicating (p = 0.012), and those who rated them high had 3.25 times the odds (p = 0.001). The effect grew with each step in perceived cost and held after income and insurance were controlled. Hence, the price of a full prescription pushed workers towards self-treatment independently of what they earned.

5. Discussion of Findings

The prevalence of 75.7% places health workers in Akwa Ibom State above the national pooled estimate of 67.8% reported by Muoka et al. (2026), yet close to the 78.1% that the same review found among occupational groups. It also aligns with levels reported among health professionals in Ethiopia (Fekadu et al., 2020; Mohammed et al., 2021) and in Kenya during the pandemic (Onchonga et al., 2020). Conversely, it exceeds the antibiotic-specific figure of 30% reported by Ojo et al. (2024), although that study measured antibiotics alone. The dominance of analgesics and antimalarials mirrors Jabbo et al. (2023) and Tobin et al. (2023). More troubling is that over half of those who self-medicated used antibiotics, which matches the 57.6% reported by Demsie et al. (2025) and sits uneasily with the stewardship role health workers are expected to lead. The prominence of ward stock and facility pharmacies as sources further supports the conclusion of Demsie et al. (2025) that ease of access is the leading practical driver.

The significant influence of income agrees with Okoye et al. (2022), who found that self-medication among Nigerian health professionals rose with annual income, and with Alduraibi and Altowayan (2022), who linked higher family income with self-medication among health students. However, it contrasts with community studies in which low income drives self-medication because formal care is unaffordable (Tesfamariam et al., 2019; Rathod et al., 2023; Makeri et al., 2025). The threshold pattern explains the contrast. Among health workers, the main barrier to self-medication is the ability to buy the medicine, not knowledge. Once income passes a modest level, direct purchase becomes easier and faster than consultation, and the opportunity cost of time predicted by Grossman's model tips the balance. The absence of a further rise in the highest band suggests that, at that level, workers could also afford formal care. In Andersen's terms, income acted as an enabling factor for self-treatment rather than for service use.

Uninsured workers had 2.72 times the adjusted odds of self-medicating compared with insured workers. This supports Yeika et al. (2021) and Ahmed et al. (2023), who identified lack of insurance as a consistent determinant, and it lends empirical weight to the argument by Muoka et al. (2026) that expanding coverage is central to reducing inappropriate use. The effect grew after adjustment because insured workers also tended to earn more, and income pushed self-medication upward. Nevertheless, two-thirds of insured workers still self-medicated, which mirrors the Spanish findings of Cotobal-Calvo et al. (2025) where universal coverage coexisted with high self-medication among health professionals. Thus, insurance removed one perceived barrier in the Health Belief Model sense, while waiting time and the awkwardness of being a patient among colleagues remained.

Education level exerted the strongest influence, with postgraduate holders at 4.40 times and fellowship holders at 12.11 times the odds of diploma holders. This is consistent with Demsie

et al. (2025), who reported very high adjusted odds of antibiotic self-medication among degree holders, master's graduates and specialists, and with Kifle et al. (2021), who found more self-medication among students in higher academic years. On the other hand, it diverges from Popoola et al. (2024), who found that knowledge of antibiotic resistance reduced self-medication among Nigerian graduates. The divergence reflects the population. Among the public, education improves awareness of risk; among health workers, advanced education adds prescribing authority and self-efficacy, which the Health Belief Model predicts will favour self-management. The non-significant difference between diploma and first-degree holders indicates that the effect becomes decisive only at postgraduate level, where clinical autonomy is greatest.

Years of experience were associated with self-medication in the bivariate analysis but had no significant independent influence once the other factors were controlled. This partly agrees with Okoye et al. (2022), who found that older health professionals self-medicated more, since age and experience overlap. However, the multivariable result indicates that the apparent effect of experience was carried by education and income, which both rise over a career. It also fits the observation by Mohammed et al. (2021) and Fekadu et al. (2020) that self-medication appears across all experience bands, suggesting that the habit forms early rather than accumulating with time. Hence, experience behaves as a marker of career position rather than as a driver in its own right.

Perceived drug cost significantly influenced self-medication, with workers who rated prescribed drugs as high in cost having 3.25 times the odds of those who rated them low. This agrees with Tesfamariam et al. (2019) and Rathod et al. (2023), who identified the cost of formal treatment as a leading reason for self-medication, and with Demsie et al. (2025), who found that cost-effectiveness motivated nearly a quarter of health professionals who self-medicated with antibiotics. It also supports the conclusion of Muoka et al. (2026) that financial barriers are among the main drivers in Nigeria. Importantly, the effect held after income and insurance were controlled. This means that even well-paid and insured workers turned to self-treatment when a full prescription looked expensive, since self-medication allowed them to buy only the tablets they judged necessary.

6. Implications of the Study

For health policy, self-medication among health workers is not simply a knowledge problem. Educational campaigns alone will reach workers who already know the risks and still self-medicate. The protective influence of insurance implies that extending effective coverage to all public health workers under the National Health Insurance Authority Act (2022) would remove one structural driver, while the independent influence of drug cost points to the need for staff access to affordable prescribed medicines.

For facility management, the prominence of ward stock and facility pharmacies as sources implies weak control over dispensing within health institutions. Stewardship programmes that target patient prescribing but ignore staff access to antibiotics leave a significant gap.

For theory, the results support the combined use of Andersen's model and the Health Belief Model. Income, insurance and drug cost behaved as enabling factors, while education behaved as a predisposing factor that operated through self-efficacy. The loss of significance for experience after adjustment shows the value of multivariable testing, since a bivariate analysis would have overstated its role.

For practice, the high odds of self-medication among postgraduate and fellowship holders imply that senior clinicians and pharmacists, who are expected to lead stewardship, are

themselves part of the problem. This undermines the credibility of patient counselling on rational drug use.

7. Limitations

The cross-sectional design did not permit causal inference. Self-medication was self-reported over a six-month recall period and may have been under-reported, particularly among senior staff. Drug cost was measured as perceived rather than actual cost. The model did not include professional category or facility level, which are closely related to education and income, and the small number of non-self-medicating fellowship holders produced a wide confidence interval. Private facilities were excluded, which limits generalisation to the private workforce.

8. Conclusion and Recommendations

Self-medication was the norm rather than the exception among health workers in selected health facilities in Akwa Ibom State, with 75.7% reporting it in the preceding six months and over half of these using antibiotics. Monthly income, health insurance coverage, education level and drug cost each had a significant independent influence on the practice, whereas years of work experience did not once the other factors were controlled. Higher income, higher education and higher perceived drug cost raised the odds of self-medication, while insurance coverage lowered them. Hence, the economic and professional position of health workers shaped their self-medication as much as their clinical knowledge did.

Based on the findings, the following recommendations were made:

1. The Akwa Ibom State Government and the Akwa Ibom State Health Insurance Agency should enrol all public health workers in the state contributory health scheme, with a dedicated staff clinic or fast-track arrangement that reduces waiting time for workers seeking care in their own facilities.

2. Hospital management should introduce a staff drug scheme that supplies prescribed medicines at subsidised prices, so that the cost of a full prescription no longer exceeds the cost of self-selected tablets.

3. Drugs and Therapeutics Committees should tighten control of ward stock and facility pharmacies, requiring a documented prescription for any medicine dispensed to staff, with particular attention to antibiotics.

4. Antimicrobial stewardship programmes in the state should include health workers as a target group, with continuing professional development sessions directed at postgraduate and fellowship-level staff on the risks of self-prescription.

5. Professional regulatory bodies, including the Medical and Dental Council of Nigeria, the Pharmacy Council of Nigeria and the Nursing and Midwifery Council of Nigeria, should develop guidance on self-prescription and prescribing for family members.

6. Occupational health units should be strengthened in tertiary and secondary facilities so that staff have confidential, low-cost and convenient access to formal consultation.

7. Future studies should include professional category and facility level in multivariable models, measure actual rather than perceived drug cost, include

private facilities, and use qualitative methods to explore why highly qualified workers prefer self-treatment.

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