Tropical Journal of Pharmaceutical Research March 2025; 24 (3): 393-401
ISSN: 1596-5996 (print); 1596-9827 (electronic)

Available online at http://www.tjpr.org
http://dx.doi.org/10.4314/tjpr.v24i3.12

Original Research Article

Exploring the demographics, educational qualifications, and remunerations of pharmacists in diverse practice settings in Nigeria

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Sent for review: 19 November 2024 *Revised accepted: 7 March 2025*

Abstract

Purpose: *To investigate the socio-demographic attributes of pharmacists, examine income patterns, consider monthly salaries and additional income sources, as well as analyze variations based on educational qualifications and practice settings.*

Methods: *This cross-sectional study examined socio-demographic characteristics, educational qualifications, income patterns, and job satisfaction among Nigerian Pharmacy graduates. Primary data were collected through a questionnaire targeting 618 Pharmacy graduate respondents. Statistical analyses, including Chi-square, analysis of variance and correlation tests, were conducted to assess key variables and determine associations.*

Results: *Socio-demographic characteristics varied across universities attended, with private universities having a higher percentage of young female graduates. First-degree holders predominantly earned monthly salaries between ₦100,000 ($236.0) and ₦150,000 ($354.0), while Ph.D. holders received higher salaries. Salary distribution analysis across practice settings showed higher salaries in academia, administration, hospitals and industry than in community pharmacies. The salary variations in industry were the highest.*

Conclusion: *The study reveals that first-degree holders earned the lowest salaries, while Ph.D holders earned higher salaries, showcasing the varied career trajectories in pharmacy. Discrepancies in salary distribution across practice settings emphasize the necessity for tailored strategies to tackle challenges encountered by pharmacists in different environments. These insights inform the need for educational policies and workforce planning efforts to improve job satisfaction among pharmacists in Nigeria.*

Keywords: *Pharmacist, Educational qualifications, Practice settings, Income discrepancies, Workforce*

Tropical Journal of Pharmaceutical Research is indexed by Scopus, Chemical Abstracts, Embase, Index Copernicus, EBSCO, African Index Medicus, JournalSeek, Directory of Open Access Journals (DOAJ), African Journal Online, Bioline International, Open-J-Gate and Pharmacy Abstracts

INTRODUCTION

Pursuing a Pharmacy degree is often associated with diverse career opportunities and financial advancement [1]. However, the rising costs of education raise concerns about whether future earnings justify this investment [2]. Economic challenges, including delayed job placements and prolonged financial dependence, further complicate the profession's economic outlook in Nigeria [3]. Understanding the economic dynamics of Pharmacy is therefore crucial. The pharmaceutical industry, essential for the

national drug supply, faces challenges such as underfunding research and limiting innovation and development [4]. Pharmacy practice in Nigeria spans hospital, community, academia, industry and administrative roles, with a shift towards patient-centered care in hospital settings [5]. Community pharmacies, the most accessible, provide prescription services and patient counseling, while administrative and academic roles shape policy and education, respectively [5].

Job satisfaction among Pharmacists is strongly linked to remuneration. Studies in Iraq and Ethiopia reinforce the importance of financial incentives and workplace improvements in enhancing motivation and job satisfaction [6,7]. Studies in Nigeria have identified salary as a primary determinant of job satisfaction [8,9]. In Benin City, Nigeria, salary increases were found to be crucial for pharmacist retention [10]. Furthermore, a national study revealed a low job satisfaction rate of 65 %, with remuneration a major concern [11]. Literature further reveals that salary benchmarks vary markedly by practice setting. In academia, salaries range from ₦136,740 – ₦164,170 for Lecturer II to ₦381,670 – ₦501,670 for Professors. Industrial roles range from ₦150,000 – ₦500,000 for Sales Representatives to above ₦1,000,000 for Production Managers. In Government and Teaching Hospitals, entry-level salaries range from ₦165,000 – ₦200,000, mid-level from ₦250,000 – ₦450,000 and senior positions from ₦450,000 – ₦800,000. Private hospitals offer entry-level earnings of ₦50,000 – ₦150,000, mid-level of ₦150,000 – ₦250,000, and senior-level of ₦200,000 – ₦400,000, while Community Pharmacists earn approximately ₦100,000 at entry level, ₦150,000 at mid-level and ₦200,000 for senior positions (exchange rate: $1 = ₦423.9) [12].

Despite studies on Pharmacy education in Nigeria, there is limited information on its economic benefits across different practice settings [13,14]. While studies highlight Pharmacy's role in healthcare and the demand for adaptable professionals [15], comparative analyses of remuneration remain scarce. This study aims to examine the socio-demographic characteristics of Pharmacists, explore income patterns across practice settings and analyze the relationship between remuneration and job satisfaction. The findings will offer valuable insights for prospective and practicing Pharmacists, as well as policymakers, in navigating the evolving pharmaceutical landscape in Nigeria.

METHODS

Design

This study employed a cross-sectional design to investigate the socio-demographic characteristics, educational qualifications, income patterns and job satisfaction among pharmacy graduates in Nigeria.

Setting

It covered all six geopolitical zones in Nigeria and participants were recruited from different practice settings, including academia, community, hospital, administrative, regulatory and pharmaceutical industries.

Sample size determination

Using the Krejcie and Morgan formula, 560 graduates were selected as the sample size with a 95 % confidence interval. Considering a 10 % attrition rate, the final sample size was adjusted to 618 respondents.

Inclusion and exclusion criteria

The study included pharmacists who graduated from any school of Pharmacy in Nigeria, aiming to capture insights from individuals with substantial post-graduation experience. Pharmacists with less than 5 years of post-graduation experience were excluded to ensure that participants had sufficient time in the field to provide comprehensive perspectives on the factors under investigation.

Sampling procedures/bias

The sample frame comprised Pharmacy graduates from schools of Pharmacy in Nigeria. Efforts were made to address potential sources of bias by ensuring anonymity and confidentiality of participants' responses. Additionally, a simple random sampling technique was applied to a comprehensive list of Pharmacy graduates from accredited Nigerian schools (obtained from PCN), ensuring that each eligible individual had an equal chance of being selected, ensuring fairness and representativeness.

Variables and measurements

Key variables included educational qualifications (first degree, Master's, Ph.D.), monthly salary, marital status, age, gender and practice setting while measurement was done using both ratio and ordinal scales.

Pilot study

Prior to the main study, a pilot study was conducted involving a sample of 30 graduate Pharmacists. The aim was to evaluate the practicality of this approach and identify any potential obstacles that could arise during the main study. Participants involved in the pilot study were not included in the subsequent main study to prevent any overlap or bias in the data collection process.

Data sources

Both primary and secondary sources were utilized. Primary data included responses from participants regarding their socio-demographic information, educational qualifications, income and additional. Secondary sources included websites and records from the Pharmacy Council of Nigeria (PCN).

Instruments

A pre-tested semi-structured questionnaire with three sections addressing demographic characteristics, remuneration of pharmacists and additional income was used.

Validation of instruments

The questionnaire underwent validity checks by experts in the field. In addition, a test-retest reliability check was conducted, resulting in an average reliability coefficient of 0.83 for the instrument.

Ethical clearance

Ethical approval was obtained from the ethics committee of Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria (ref no. IPHOAU/12/1214). Informed consent was obtained from all participants before their involvement in the study.

Data collection

The survey instrument was administered using Google Forms, and eligible participants received the survey link via email and WhatsApp. Participants were provided with clear information about the nature of the study, its purpose and the use of their responses. They were also informed about their rights as participants, including the voluntary nature of their participation and the confidentiality of their responses. This process ensured that participants were fully aware of the study's objectives and their role in it before providing their responses. The data collection period, relying on self-reported responses, lasted approximately four months.

Data analysis

Data were coded and analyzed using Statistical Package for Social Sciences (SPSS) Software (Version 25). Descriptive statistics such as frequencies and percentages were used for objective determination. Inferential statistics including Chi-square, correlation analysis, Welch's ANOVA and Games-Howell's multiple comparisons *post hoc* test were employed at a 5 % level of significance for further analysis of the study objectives.

RESULTS

Socio-demographic characteristics of Pharmacists across universities

Table 1 presents the socio-demographic characteristics of Pharmacists across different universities. The variables examined include age, gender, religion and marital status. The findings indicated that most respondents across all universities were below 40 years old, with the highest percentage observed in private universities (94.1 %). The percentage of females was highest in private universities (64.7 %), while males dominated in Federal and State Universities. A marginally significant association was observed between gender and university type (Chi-square = 0.05, p = 0.05). Christians constituted the majority across all university types, with the highest percentage recorded in private universities (98.0 %). In the study, there were more married respondents across all university types, except in private universities where more respondents were single. A highly significant association was found between marital status and university type (Chi-square = 0.000, $p < 0.001$).

The distribution of respondents across different areas of Pharmacy practice showed that among the 618 respondents, majority (37.5 %) worked in hospital settings, followed by those in Community Pharmacy (35.1 %). Academic Pharmacy practice accounted for 13.1 % of respondents, while a smaller proportion (8.3 %) were employed in the pharmaceutical industry, and Pharmacists in administrative and research settings comprised 6.0 %.

Correlation between remuneration and educational level of respondents

The relationship between monthly salary of Pharmacy graduates and their educational

qualifications is summarized in Table 2. First-degree holders mostly earned between ₦100,000 ($236.0) and ₦150,000 ($354.0) representing 31.1 % of respondents, while Ph.D. holders earned between ₦201,000 ($474.0) and ₦300,000 ($710.0). Table 2 also showed analysis of additional monthly incomes or gifts received by Pharmacy graduate respondents based on their educational qualifications.

Table 1: Socio-demographic characteristics of respondents

Variable		Type of University						Chi-square test
		Federal		***State***		***Private***		
		N	*%*	*N*	*%*	*N*	*%*	
Age (Years)	No response	0	0	0	0	1	2	0.000
	<40	246	51	79	92.9	48	94.1	
	40-50	133	27.6	6	7.1	2	3.9	
	51-60	74	15.4	0	0	0	0	
	>60	29	6	0	0	0	0	
Gender	Female	227	47.1	44	51.8	33	64.7	0.050
	Male	255	52.9	41	48.2	18	35.3	
Religion	No response	2	0.4	0	0	0	0	0.011
	Atheist	2	0.4	0	0	0	0	
	Christian	398	82.6	81	95.3	50	98	
	Islam	80	16.6	4	4.7	1	2	
Marital Status	Divorced	3	0.6	0	0	0	0	0.000
	Engaged	12	2.5	6	7.1	4	7.8	
	Married	379	78.6	43	50.6	18	35.3	
	Single	88	18.3	36	42.4	29	56.9	

Table 2: Monthly salary of respondents with their level of education in Nigeria

Variable		Level of Education					
		First Degree		***Masters***		***PhD***	
		N	*%*	*N*	*%*	*N*	*%*
Monthly salary of respondents	Below ₦100,000 ($236.0)	67	16.4	2	1.1	0	0
	₦100,000-₦150,000 ($236.0-$354.0)	127	31.1	41	23.6	4	11.1
	₦151,000-₦200,000 ($356.0-$472.0)	78	19.1	47	27	7	19.4
	₦201,000-₦300,000 ($474.0-$710.0)	77	18.9	41	23.6	16	44.4
	₦301,000-₦400,000 ($712.0-$946.0)	27	6.6	14	8	7	19.4
	₦401,000-₦500,000 ($948.0-$1,182.0)	13	3.2	8	4.6	2	5.6
	Above ₦500,000 ($1,184.0)	10	2.5	15	8.6	0	0
	No response	9	2.2	7	3.5	0	0
Additional income received monthly apart from your basic income	Above ₦500,000 ($1,184.0)	1	0.2	5	2.9	0	0
	Below ₦20,000 ($47.2)	1	0.2	0	0	0	0
	Below ₦100,000 ($235.9)	216	52.9	80	46	9	25
	₦100,000-₦150,000 ($235.9-$353.9)	18	4.4	13	7.5	2	5.6
	₦151,000-₦200,000 ($356.0-$472.0)	48	11.8	20	11.5	10	27.8
	₦201,000-₦300,000 ($474.0-$710.0)	10	2.5	6	3.4	1	2.8
	₦301,000-₦400,000 ($712.0-$946.0)	3	0.7	1	0.6	2	5.6
	₦401,000-₦500,000 ($948.0-$1,182.0)	1	0.2	3	1.7	0	0
	None	110	27	46	26.4	12	33.3

Exchange rate at the time of the study: US$1 = ₦423.9

It showed that first-degree holders had the highest percentage receiving below ₦100,000 ($236.0; 52.9 %), whereas Ph.D. holders had the highest percentage receiving above ₦200,000 ($472.0). An ANOVA test revealed significant differences in salary among educational levels (F (2,615) = 18.71, p = 0.000) and additional income received (F (4,613) = 4.28, p = 0.001), with Welch's robust test confirming these differences for salary (p = 0.000) and additional income (p = 0.036). Furthermore, analysis of the influence of religion on supplementary income revealed no significant differences among religious groups (F (3,614) = 4.95, p = 0.403). Lastly, a correlation analysis unveiled a positive correlation (r = 0.285, p < 0.01) between respondents' salaries and supplementary income, as well as the amount of additional income with a similar correlation observed 0.285 (p < 0.01), signifying a consistent relationship when viewed from either perspective.

Games-Howell's multiple comparisons *post hoc* test (Table 3) revealed variations in salary between First Degree and the other two educational levels, Masters (p = 0.000) and Ph.D. (p = 0.000). However, for additional income mean differences, no significant differences were found among educational levels.

The salary distribution analysis in various practice settings showed some interesting trends (Table 4). It was observed that more respondents (32.1 %) from Community Practice earned below ₦100,000, constituting 22.6 % of all respondents. In the ₦100,000 - 150,000 salary range, respondents from academia earned more (32.1 %). Notably, academia, administration and hospital practices were associated with higher salary distributions, while industry practice led in the higher salary ranges, with 18.9 % of respondents earning above ₦500,000. Conversely, Community Practice was associated with lower salary earnings. An analysis of Variance (ANOVA) was carried out to examine the salaries of pharmacy graduates across various practice settings, and the findings indicated a statistically significant difference in income across these settings (F (4,613) = 15.69, p = 0.000), a result further confirmed by the Welch's robust test. The Games-Howell multiple comparisons (Table 5) offered valuable insights into the significant differences in mean salaries between various areas of practice, with the most notable distinction being between community practice and other sectors, including academia (p = 0.002), administration (p = 0.001), hospital (p = 0.000) and industry (p = 0.000).

Correlation between areas of practice and remuneration of respondents

The findings presented in Tables 4 and 5 indicate that Pharmacy graduates engaged in community practice experienced significantly different salary levels compared to their counterparts in academia, administration, hospital and industry. However, no significant differences were identified between other pairs of practice areas, implying that, beyond community practice, the salary distribution tends to be more consistent.

Table 3: Games-Howell multiple Comparisons of Level of Education and Salary of Graduate Respondents; Additional Income

Dependent variable	Level of Education (I)	Level of Education (J)	Mean difference (I-J)	Std. error	Sig	95 % Confidence interval	
						Lower bound	*Upper bound*
Monthly salary of respondent	First Degree	Masters	-0.708*	0.145	0.000	-1.05	-0.37
		PhD	-1.080*	0.188	0.000	-1.53	-0.63
	Masters	First Degree	0.708*	0.145	0.000	0.37	1.05
		PhD	-0.372	0.213	0.195	-0.88	0.14
	PhD	First Degree	1.080*	0.188	0.000	0.63	1.53
		Masters	0.372	0.213	0.195	-0.14	0.88
Other monies or gifts received monthly apart from your basic income	First Degree	Masters	-0.286	0.132	0.080	-0.60	0.03
		PhD	-0.444	0.262	0.221	-1.08	0.20
	Masters	First Degree	0.286	0.132	0.080	-0.03	0.60
		PhD	-0.158	0.283	0.843	-0.84	0.52
	PhD	First Degree	0.444	0.262	0.221	-0.20	1.08
		Masters	0.158	0.283	0.843	-0.52	0.84

*P < 0.05

Table 4: Salaries of Pharmacy respondents in the different areas of practice

Salary of Respondent in a month	Area of practice									
	Academia		***Admin***		***Community***		***Hospital***		***Industry***	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Below ₦100,000 ($236.0)	1	1.2	2	5.4	49	22.6	16	6.9	1	2
₦100,000-₦150,000 ($236.0-$354.0)	26	32.1	6	16.2	76	35	55	23.7	9	17.6
₦151,000-₦200,000 ($356.0-$472.0)	23	28.4	6	16.2	38	17.5	54	23.3	11	21.6
₦201,000-₦300,000 ($474.0-$710.0)	19	23.5	7	18.9	28	12.9	64	27.6	16	31.4
₦301,000-₦400,000 ($712.0-$946.0)	4	4.9	2	5.4	10	4.6	25	10.8	7	13.7
₦401,000-₦500,000 ($948.0-$1,182.0)	4	4.9	5	13.5	2	0.9	11	4.7	1	2
No response	2	2.4	2	5.4	7	3.3	2	0.9	2	3.9
Above ₦500,000 ($1,184.0)	2	2.5	7	18.9	7	3.2	5	2.2	4	7.8

Exchange rate at the time of the study: US$1 = ₦423.9

Table 5: Games-Howell multiple comparisons of area of practice and salary of graduate respondents

Dependent variable	Area of practice (I)	Area of practice (J)	Mean difference (I-J)	Sr	Sig	95% Confidence interval	
						Lower bound	***Upper bound***
Monthly salary of respondents	Academia	Administration	-0.867	0.383	0.175	-1.95	0.22
		Community	0.681*	0.182	0.002	0.18	1.18
		Hospital	-0.158	0.177	0.899	-0.65	0.33
		Industry	-0.467	0.270	0.423	-1.22	0.29
	Administration	Academia	0.867	0.383	0.175	-0.22	1.95
		Community	1.548*	0.366	0.001	0.50	2.59
		Hospital	0.708	0.364	0.310	-0.33	1.75
		Industry	0.400	0.417	0.873	-0.77	1.57
	Community	Academia	-0.681*	0.182	0.002	-1.18	-0.18
		Administration	-1.548*	0.366	0.001	-2.59	-0.50
		Hospital	-0.840*	0.136	0.000	-1.21	-0.47
		Industry	-1.148*	0.246	0.000	-1.84	-0.46
	Hospital	Academia	0.158	0.177	0.899	-0.33	0.65
		Administration	-0.708	0.364	0.310	-1.75	0.33
		Community	0.840*	0.136	0.000	0.47	1.21
		Industry	-0.308	0.242	0.708	-0.99	0.37
	Industry	Academia	0.467	0.270	0.423	-0.29	1.22
		Administration	-0.400	0.417	0.873	-1.57	0.77
		Community	1.148*	0.246	0.000	0.46	1.84
		Hospital	0.308	0.242	0.708	-0.37	0.99

DISCUSSION

The current study explored the relationships between the characteristics, educational qualifications and financial outcomes to unveil patterns and implications for the profession. The findings disclosed noteworthy trends in age distribution, gender representation, religious affiliations and marital status across different university types. Private universities stood out, with a significantly higher percentage of respondents below 40 years, particularly females. This aligns with broader trends observed in Pharmacy education in other countries. A study by Loo *et al* suggested that high percentage of young females in Malaysia could be attributed to private institutions' perceived prestige and safety [16]. In exploring private education in Nigeria, Adebayo highlighted an inclination of parents to send more female children to private institutions [17].

Furthermore, the findings suggest a higher number of Pharmacists are in hospitals and Community Pharmacy practices. Incidentally, in a

survey of professional year Pharmacy students in three Nigerian universities, most of the students indicated a preference to work in the hospital and Community Pharmacy practice settings [18]. This may be because students prefer these two settings for different reasons ranging from remunerations, autonomy, passion and societal impact [19].

The analysis of remunerations accruable to pharmacists in various practice settings in Nigeria provides insights into the financial landscape of the pharmacy profession. The findings shed light on salary differentials and additional income sources. The financial profile of first-degree holders, with a substantial proportion receiving additional income below ₦100,000, emphasizes the importance of understanding economic diversity within the profession, especially in difficult economic conditions.

In examining educational qualifications and financial outcomes, the study revealed that first-degree holders dominate the demographic landscape, primarily earning monthly salaries between ₦100,000 and ₦150,000. Though only professional pharmaceutical degrees are required to practice Pharmacy in Nigeria, those with Ph.D. degrees command higher salaries, aligning with the advanced expertise associated with this qualification and showing the value of continuous professional development where indicated e.g. in academia [20].

The analysis of salary distribution across practice settings provides insights into the economic landscape of pharmacy professionals. Though there is limited published data comparing remuneration details in practice settings in Nigeria, other countries, e.g. studies from the United States, show that Community Pharmacists earn more over their entire careers compared to hospital and academic Pharmacists [21]. These results show that academia, administration and hospital practice are associated with relatively higher salaries while community practice lags. The observed differences could be due to medication costs and differences in Community Pharmacy practice model between Nigeria and the United States [22]. Pharmacists employed in the industrial sector emerged as the highest earners among the surveyed practice settings. The elevated remuneration in the industry may be attributed to several factors. The industry often operates on a performance-based compensation model, linking financial rewards to the tangible contributions of individual Pharmacists. Multinational corporations, prevalent in the pharmaceutical industry, tend to offer competitive salaries to attract and retain skilled professionals.
Additionally, Pharmacists in the industry, especially those advancing in positions of more responsibility, may benefit from specialized skills and expertise. This dynamic environment encourages increased productivity and financial rewards. Like other findings, Community Pharmacists in this study emerged as the least remunerated among the surveyed practice settings. Their income is often influenced by the success and profitability of their Pharmacy premises. Unlike their counterparts in the industry, Community Pharmacists may face more variability in their monthly income, as it depends on factors such as prescription volumes and over-the-counter sales. Despite these financial challenges, Community Pharmacists play a crucial role in primary healthcare and community well-being [23]. Their contributions extend beyond mere dispensing of medications to active involvement in patient education and health promotion. From the information on salaries obtained from literature, Community Pharmacists are also not so well compensated when compared to Pharmacists in other practice settings. Beyond their regular monthly income, Pharmacists in administration and industry reported receiving more money. Pharmacy is a multifaceted profession and professionals may engage in various roles. This supplementary income may be attributed to growing consulting practice compensation and industry performance bonuses beyond regular salaries [24].

In summary, remuneration for Nigerian Pharmacists varies by practice setting, driven by factors such as industry nature, career progression and role diversity. The pharmaceutical industry offers competitive, performance-based pay and bonuses, while other sectors provide unique non-monetary benefits that enhance job satisfaction. Findings from this study confirm salary disparities across practice areas, offering a useful benchmark for new Pharmacy graduates.

Despite these insights, the cross-sectional design limits the understanding of dynamic changes and detailed income differentials. Future studies should adopt longitudinal approaches and utilize more granular salary data. Overall, the study advances the understanding of the socio-demographic profile and financial outcomes of Pharmacy graduates, serving as a valuable resource for policymakers, educators and industry professionals.

CONCLUSION

This study provides insights into the socio-demographic and educational characteristics of Pharmacy graduates. Notable variations occur in age, gender and marital status across university types. The analysis of income patterns and disparities across practice settings offered critical insights as academia, administration and hospital practice exhibit higher salary brackets than community practice. The industry sector stands out as the highest-paying sector due to competitive dynamics. These findings contribute valuable knowledge for stakeholders and offer vital considerations for educational policies and workforce planning in the evolving pharmaceutical practice.

DECLARATIONS

Acknowledgement/Funding

None.

Ethical approval

Ethical approval was obtained from the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Osun State (ref no. IPHOAU/12/1214).

Use of Artificial intelligence/Large language models

We declare also that we did not use Generative artificial intelligence (AI) and AI-assisted technologies in writing the manuscript.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

No conflict of interest is associated with this work.

Contribution of authors

We declare that this work was done by the author(s) named in this article, and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

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