Cost of undergraduate pharmacy training in Nigeria

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ABSTRACT

Background: Private costs of undergraduate pharmacy training have been on the rise as a result of economic crisis all over the world due to COVID 19, wars and problems peculiar to different nations.

Objectives: As a result, this study sought to determine the private costs of acquiring an undergraduate pharmacy degree in Nigeria and compare these costs across public and private universities.

Methods: The study was a descriptive survey of 1361 pharmacy students in 18 accredited pharmacy schools in Nigeria. Stratified random sampling was used to draw the sample from the population. Primary data was obtained with the use of a set of pretested questionnaires while secondary data was obtained from the administrative offices of the schools involved. Data were processed using frequencies, percentages, weighted averages and analysed with Chi square and ANOVA.

Results: The result showed the average cost of studying pharmacy in a private university for five years to be ₦6,620,942.90 ($16,088.21) and that of public universities to be ₦2,058,558.36 ($5,002.09). It also revealed that there was a statistically significant difference between public and private schools for costs of tuition (F (1,1360) = 80142.57 (p =.000), feeding (F (1,1360) = 8.657 (p =.003)), health care (F (1,1360) = 197.866 (p =.000)), textbooks (F (1,1360) = 56.647 (p =.000)), laundry (F (1,1360) = 217.269 (p =.000)) and accommodation (F (1,1384) = 3889.049 (p =.000)) per session.

Conclusion: The study showed that the cost of undergraduate pharmacy education in private universities was about three times more than in public universities. Cost components of studying pharmacy include feeding, health, textbooks, handouts, transportation, internet data plans, laundry, accommodation, and tuition.

Keywords: Costs, Undergraduate Training, Pharmacy, Education, Financing

Coût de la formation de premier cycle en pharmacie au Nigeria

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RÉSUMÉ

Contexte: Les coûts personnels de la formation de premier cycle en pharmacie continuent d'augmenter en raison de la crise économique qui sévit dans le monde entier à cause de COVID 19, des guerres et des problèmes propres aux différentes nations.

Objectifs: Par conséquent, cette étude cherche à déterminer les coûts personnels liés à l'acquisition d'un diplôme de premier cycle en pharmacie au Nigéria et à comparer ces coûts entre les universités publiques et privées.

Méthodes: L'étude était une enquête descriptive auprès de 1 361 étudiants en pharmacie dans 18 écoles de pharmacie accréditées au Nigeria. Un échantillonnage aléatoire stratifié a été utilisé pour tirer l'échantillon de la population. Les données primaires ont été obtenues à l'aide d'une série de questionnaires testés au préalable, tandis que les données secondaires ont été obtenues auprès des bureaux administratifs des écoles concernées. Les données ont été traitées en utilisant des fréquences, des pourcentages, des moyennes pondérées et analysées à l'aide du chi carré et de l'ANOVA.

Résultats: Le résultat a montré que le coût moyen des études en pharmacie dans une université privée sur une période de cinq ans s'élevait à 6 620 942,90 ₦ (16 088,21 $) et celui des universités publiques à 2 058 558,36 ₦ (5 002,09 $). L'étude a également révélé qu'il existait une différence statistiquement significative entre les écoles publiques et privées en ce qui concerne les frais de scolarité (F (1,1360) = 80142,57 (p = 0,000), l'alimentation (F (1,1360) = 8,657 (p = 0,003)), les soins de santé (F (1,1360) = 197,866 (p = 0,000)), les manuels (F (1,1360) = 56,647 (p = 0,000)), la lessive (F (1,1360) = 217,269 (p = 0,000)) et le loyer (F (1,1384) = 3889,049 (p = 0,000)) par année.

Conclusion: L'étude a montré que le coût des études de premier cycle en pharmacie dans les universités privées était environ trois fois plus élevé que dans les universités publiques. Les éléments qui entrent dans le coût des études de pharmacie comprennent l'alimentation, la santé, les manuels scolaires, les documents, le transport, les forfaits de données Internet, la lessive, le loyer et les frais de scolarité.

Mots-clés : Coûts, formation de premier cycle, pharmacie, éducation, financement

INTRODUCTION

There have been increasing concerns about the costs of obtaining a university degree, which has necessitated households viewing education as a profitable investment.[1] The United States Department of Education stated that the cost of higher education has a direct impact on access to it, implying that an increase in costs can constitute reasonable concern to students, parents, and education policymakers.[2] According to Blagg and Blom, a university education is just like an investment that will pay off over time.[3] However, undergoing a bachelor's degree is an expensive investment, with severe implications for poor and middle-class households.[4] This is in contrast to UNESCO's recommendation that education must be inclusive and accessible to all, irrespective of their social class, race, gender, sexuality, ethnic background, or disabilities.[5]

The cost of tertiary education can be divided into academic and non-academic costs.[6] Academic cost covers all items related to academic instruction such as tuition fee, examination charge, departmental/faculty dues, project/assignment fees, teaching practice, excursion, textbook, stationery, tools, practical sessions, etc. Non-academic costs are the cost of items that facilitate learning, such as accommodation, feeding, transportation, medical fees, calls, clothes, etc.[6] Education has been recognized as critical to the social, economic, and political development of a state, as well as the individual.[7] Still, the common argument is that institutions of higher learning would have to reduce the cost needed to produce graduates for an increase in enrolment to occur.[8] This is corroborated by reports by the World Bank that tertiary education is out of reach to the poorest and most marginalized populations of the world, an example being Sub-Saharan Africa, where only 9 per cent of the traditional aged cohort for tertiary education continues from secondary to tertiary education.[9]

Inflation is at its highest in many countries of the world, with Nigeria recording its highest inflation rate since 2005 in 2022.[10] A consequence of the high inflation rate is an increase in the cost of education. There are several colleges in the United States (US) that offer admission to students to pursue their degree in pharmacy, and there lies a variation in their overall cost for the study.[6] In the 2005-2006 and 2015-2016 academic years, the tuition per annum almost doubled in colleges of pharmacy to about $14,796 and $28,956.[7] The cost of pharmacy education in the United States has been on the rise, and the average cost of pharmacy education in the US is about $25,000 per annum.[11] This increase in average cost has been largely because of increases in tuition costs in pharmacy education.[9]

In the United Kingdom, tuition rise has been quite abrupt, from about £1000 ($1,250) per year that was being charged decades ago to up to a range of £8,000-£10,000 ($10,000-$12,500) per year.[12] The University of Manchester and the University of Birmingham charge £24,000 ($30,000) and £24,600 ($30,750) for international students, respectively.[13,14] Johnson and colleagues reported that the proportion of blacks (which includes Nigerians) who have opted for pharmacy education has increased over a decade (2010-2019).[15] However, Opensdoors report on new international student enrolment showed a major drop in enrolment.[16] This was further corroborated by the Business day report that there was a 6.5 per cent decrease in enrolment of Nigerians in US universities in the 2020/2021 session, which could be explained by the incidence of the COVID-19 Pandemic.[17] Also, the devaluation of the Naira has increased the cost of education in dollars, making it more profitable to study in Nigeria but still expensive for the average Nigerian household due to the increased inflation rate.[10]

Private and public universities in Nigeria show different levels of flexibility to the increasing inflation rate as it relates to tuition fees, with public universities having a relatively constant tuition fee over the years compared to private universities despite the increasing inflation rate.[10] However, tuition fee is only a part of education costs, which includes other academic costs and non-academic costs.[6] Since many households resort to taking loans to put students through tertiary education, it is imperative for these households to know the cost of education, which will inform the amount and frequency of loans collected, as well as guide other relevant financial decisions.[18] This study reveals the major cost components required to study pharmacy in Nigeria. Considering the relevance of pharmacists in society, the need for international assistance, like grants and scholarships, to acquire a pharmacy education is necessary.

Training pharmacists can be cost-intensive, and individuals interested in obtaining a pharmacy degree may become discouraged by the rising cost of pharmacy education if they cannot afford to pay for it.[1] However, if nothing is done, the shortfall in pharmacists persists or worsens, and this can have harmful effects on the population.[19] Other than the loans households collect, scholarship is another way education in Nigeria is

financed. There are different types of scholarships, depending on how much of the academic costs are covered. While some scholarships offer to cover all academic costs, some cover only the tuition fees. If only the tuition fee is covered, there will be no significant change in the fee provided by scholarships for public universities.

Okebukola clearly showed that the total average unit cost per student per discipline for all science-based disciplines in Nigeria was ₦239,402 ($581.72), greater than ₦186,525 ($453.24) for Arts-based disciplines, and the average unit cost per student per discipline ranged from a minimum of ₦141,532 ($343.91) for Business Administration/Management to a maximum of ₦302,096 ($734.06) for Health-related disciplines.[20] Whereas, Ofem and Akinyemi (2012) found out that the average private unit cost for a full-time bachelor's degree program per student per discipline in a public university in 2007/2008 was ₦193,170.15 ($469.38) with a minimum average private unit cost of ₦175,536.26 ($426.54) for Education courses and ₦262,733.95 ($638.42) for College of Medicine. It is, however, difficult to retrieve private unit costs for pharmacy for the same period.[21] There is a need for updated knowledge of the average private costs of bachelor programs in different fields since there are continuous increases in the private costs of tertiary education. Students are at the centre of the cost of education discussion and are familiar with what they spend money on. Accessing the private cost of education from students would be the right thing to do.

The study aims to determine the costs of undergraduate pharmacy training in Nigeria's public and private institutions. Findings from the study will benefit prospective students/parents and the university administrations regarding the average cost components for a pharmacy degree. Also, the study will provide information that could increase the involvement of the government and other bodies in sponsoring university education, particularly for those who cannot afford it. Significantly, results from this study will impact the landscape of the pharmacy profession by providing information to increase enrolments in pharmacy education, which will increase the number of pharmacists.

METHODS

The study was a cross-sectional survey of pharmacy students in Nigeria. It employed a descriptive study design using both primary and secondary data sources. The population of the pharmacy students was 11,014 and included students from 100-500 levels in 18 accredited pharmacy schools in Nigeria which was determined from the information obtained from administrative offices in the universities. The universities used were randomly selected from the 20 accredited schools in the country (as at 2019). Sixteen of the schools were federal and state government-owned (public), while two of the schools were privately owned, to allow for comparison. The public schools are: Ahmadu Bello University (ABU), Obafemi Awolowo University (OAU), University of Benin (UNIBEN), University of Ibadan (UI), University of Lagos (UNILAG), University of Nigeria (UNN), University of Uyo (UNIUYO), Nnamdi Azikiwe University (NAU), University of Jos (UNIJOS), University of Maiduguri (UNIMAID), University of Port-Harcourt (UNIPORT), Usman Danfodio University (UDUS), Delta State University(DELSU), Niger Delta University(NDU), Olabisi Onabanjo University (OOU) and Gombe State University (GSU). The private schools are Igbinedion university (IUO) and Madonna university (MUA) (these were the only two private universities in the country when the study was conducted). The sampling method used was stratified random sampling employed across the schools and the different levels (100L-500L) of the students. The sample size was calculated using the Krejcie and Morgan formula for determining sample size from a known population.[22] The calculated sample size at a confidence level of (95 per cent) was 1349, with an overage of 10 per cent factored into the calculations to account for attrition in the data collected the sample size became 1364. The sampling of respondents was done on a prorated basis across the different levels of each school using the sample size calculated from the population of pharmacy students.

The variables for the study were the cost of feeding, textbooks, laundry, handouts, data plans, health care, transportation, accommodation, and tuition. The other variable was the type of school, i.e., public and private. The variables were measured on a ratio scale. A set of pretested semi-structured questionnaires were employed as the instrument for the study. The questionnaire was adapted from the study of Bailey *et al*., Items, like food, rent, books and supplies, telecommunications, hospitals and gasoline were adapted as feeding, accommodation, textbooks, rate for data plans, health care and transportation respectively.[23] University specific information such as tuition costs, accommodation costs (on-campus residence) were obtained from the individual school's administrative offices. The questionnaire comprised two sections to elicit information on the demographic characteristics and cost components of undergraduate pharmacy education.

The professional judgment of the relevant senior members ascertained the validity, and the internal consistency gave a Cronbach alpha value of 0.87.

This research protocol was approved by the Institute of Public Health, Osun State, with reference number IPHOAU/12/1214. The instrument was pilot-tested and administered using google forms. The survey link was sent to eligible participants via email and WhatsApp, Informed consent was obtained from all participants involved in the study. The data was self-reported, and data collection lasted about five months. Data were organised with descriptive statistics such as frequencies, percentages, weighted averages, median and analysed with inferential statistics like analysis of variance (ANOVA) - Welch's method, Games Howell's multiple comparison test as post-hoc test and Chi square test.

Weighted averages were used in calculating the exact amount for each cost component of undergraduate pharmacy training. The precise values of the weighted averages were calculated by multiplying the two decimal place values of the weighted averages by the value of the class interval and adding to the smaller values of the position indicated by the weighted averages.

RESULTS

The survey responses received was 1361 and Table 1 presents the results of the socio-demographic characteristics of undergraduates. With respect to age, the highest percentage of students were aged 20-25 years (62.6 per cent, 56.9 per cent) and were females (51.3 per cent, 61.3 per cent) across public and private universities, respectively. More students had a residence on campus (51.9 per cent) compared to those who stayed off campus (48.1 per cent) for public schools. No student in the private universities stayed off campus. The respondents were distributed across 100-500 levels, with most respondents being 100-level students.

Table 2 presents information about the tuition cost of studying pharmacy in public and private universities. The highest-paying public school was Olabisi Onabanjo University (₦827,350, $2,010.38), while the school with the lowest tuition cost was the University of Lagos (₦97,500, $236.92). The average tuition cost (from 100 level-500 level) for public universities is ₦333,470.62 ($810.30), while the average for private universities is ₦4,072,500 ($9,895.76).

Table 3 shows the weighted averages of each cost component under the types of university. The results show that the respondents in public and private universities spent most on accommodation ₦123,786.30 ($300.79), ₦130,506.02 ($317.12), and feeding ₦79,272.78 ($192.62), ₦90,960.48 ($221.02) respectively which did not vary too widely from each other. However, private universities spent more on health care (₦40,511.88, $98.44) when compared with their public university counterparts (₦12,516.70, $30.41) while public universities (₦34,554.48, $83.96) spent more on laundry when compared with private schools (₦7,529.12, $18.29).

Table 1: Demographic Characteristics of Respondents across the Types of Schools

Variables		Public		Private		Chi Square test
		₦	%	₦	%	
Age (Years)	Less than 20	335	29.0	70	34.3	.131
	20-25	724	62.6	116	56.9	
	26-30	87	7.5	13	6.4	
	Above 30	11	1.0	5	2.5	
		1157	**100**	**204**	**100**	
Gender	Female	590	51.3	125	61.3	.008
	Male	559	48.7	79	38.7	
		1149	**100**	**204**	**100**	
Level of Study	100	280	24.2	46	22.5	.392
	200	264	22.8	44	21.6	
	300	229	19.8	46	22.5	
	400	192	16.6	34	16.7	
	500	192	16.6	34	16.7	
		1157	**100**	**204**	**100**	
Place of Residence	Campus	600	51.9	204	100.0	.000
	Off campus	557	48.1	0	0	
		1157	**100**	**204**	**100**	

Table 2: Tuition Costs of Studying Pharmacy in Nigerian Pharmacy Schools

S/N	Name of School	Amount Paid by 100L (N)	Amount Paid by 200L (N)	Amount Paid by 300L (N)	Amount Paid by 400L (N)	Amount Paid by 500L (N)	Total (N)
	Federal Schools						
1	ABU	21,900	21,900	21,900	21,900	21,900	109,500
2	OAU	97,000	30,700	30,700	30,700	30,700	219,800
3	UNIBEN	135,000	15,500	15,500	15,500	15,500	197,000
4	UI	28,200	31,600	34,600	33,100	36,600	164,100
5	UNILAG	19,500	19,500	19,500	19,500	19,500	97,500
6	UNN	71,000	53,100	47,000	47,000	45,000	263,100
7	UNIUYO	66,000	51,600	48,700	48,600	48,600	263,500
8	NAU	23,100	23,100	23,100	23,100	23,100	115,500
9	UNIJOS	45,000	45,000	45,000	45,000	45,000	225,000
10	UNIMAID	35,000	28,500	28,500	26,000	26,000	144,000
11	UNIPORT	113,950	45,000	45,000	45,000	45,000	293,950
12	UDUS	53,000	48,000	48,000	48,000	48,000	245,000
13	DELSU	61,100	80,000	78,000	73,200	73,000	365,300
14	NDU	200,000	170,000	140,000	70,000	70,000	650,000
15	00U	189,530	160,730	159,030	159,030	159,030	827,350
16	GSU	85,500	72,500	72,500	72,500	72,500	375,500
						Total	**5,335,530**
						Average	**333,470.62**
	Private Schools						
17	IUO	730,000	730,000	730,000	730,000	730,000	3,650,000
18	MUA	899,000	899,000	899,000	899,000	899,000	4,495,000
						Total	**8,145,000**
						Average	**4,072,500**

Source: Administrative Offices and Websites of the different universities

Table 3: Weighted Average of Cost Components of Studying Pharmacy in Nigeria

Variables	Public Schools		Private Schools	
	Weighted average ∑fx/∑f	(N)	Weighted average ∑fx/∑f	(N)
Feeding per session	7.76	79,272.78	8.23	90,960.48
Health care per session	2.55	12,516.70	4.59	40,511.88
Textbooks per session	5.24	12,519.02	6.25	15,879.87
Lecture handout per session	3.31	22,496.52	3.59	26,654.2
Transport per session	3.54	27,761.2	4.06	33,169.04
Rate for data plans per session	3.87	33,030.5	4.43	38,295.18
Funds on laundry	4.86	34,554.48	2.21	7,529.12
Accommodation	2.195	123,786.30	8.00	130,506.02

Table 4 shows the analysis of Variance (ANOVA) for the costs of pharmacy education across public and private schools. The result reveals that there was a statistically significant difference across the schools for costs of tuition (F (1,1360) = 80142.57 (p =.000), feeding (F (1,1360) = 8.657 (p =.003)), health care (F (1,1360) = 197.866 (p =.000)), textbooks (F (1,1360) = 56.647 (p =.000)), laundry (F (1,1360) = 217.269 (p =.000)) and accommodation (F (1,1384) = 3889.049 (p =.000)) per session. But there was no statistically significant difference for lecture handouts (F (1,1357) = 1.865 (p = .172)), transport (F (1,1359) = 2.806 (p = .094)) and data plans (F (1,1350) = .142 (p = .707)).

The information obtained about the average cost of pharmacy training for freshmen (100-level students) and returning students (200 - 500 level) in public and private universities revealed that freshmen in public universities spend ₦435,788.88 ($1,058.92), while returning students spend ₦405,692.86 ($985.79) averagely per session (Table 5). On the other hand, freshmen and returning students in private universities both spend ₦1,324,188.58 ($3,217.64). For a five-year study in the university, a student in a public university will spend approximately ₦2,058,558.36 ($5,002.09), while a student in a private university spends approximately ₦6,620,942.90 ($16,088.21).

Table 4: One-way Analysis of Variance for Costs of Studying Pharmacy

Variables		Sum of Squares	Mean Square	F	Sig.
Tuition fees	Between Groups	9778.528	9778.528	80142.579	.000
	Within Groups	168.746	.122		
	Total	9947.274			
Feeding per semester	Between Groups	48.735	48.735	8.657	.003
	Within Groups	7785.515	5.629		
	Total	7834.250			
Health care per semester	Between Groups	699.103	699.103	197.866	.000
	Within Groups	4886.425	3.533		
	Total	5585.528			
Textbooks per session	Between Groups	506.446	506.446	56.647	.000
	Within Groups	12364.572	8.940		
	Total	12871.018			
Lecture handout per semester	Between Groups	7.447	7.447	1.865	.172
	Within Groups	5508.910	3.992		
	Total	5516.357			
Transport per semester	Between Groups	17.774	17.774	2.806	.094
	Within Groups	8755.182	6.335		
	Total	8772.957			
Rate for data plans per semester	Between Groups	.763	.763	.142	.707
	Within Groups	7453.470	5.389		
	Total	7454.234			
Funds on laundry	Between Groups	1399.038	1399.038	217.269	.000
	Within Groups	8905.417	6.439		
	Total	10304.455			
Accommodation per session	Between Groups	7463.859	7463.859	3889.049	.000
	Within Groups	2654.252	1.919		
	Total	10118.111			

Table 5: Estimated Costs of Studying Pharmacy in Nigerian Universities

Public University					
S/N	**Items**	**Freshmen (₦)**	**%**	**Returning Students (₦)**	**%**
1.	Feeding per session	79,272.78	18.19	79,272.78	19.54
2.	Health cost per session	12,516.70	2.87	12,516.70	3.09
3.	Textbooks per session	12,519.02	2.87	12,519.02	3.09
4.	Lecture handout per session	22,496.52	5.16	22,496.52	5.54
5.	Transport per session	27,761.2	6.37	27,761.2	6.84
6.	Rate for data plans per session	33,030.5	7.58	33,030.5	8.14
7.	Funds on laundry per session	34,554.48	7.93	34,554.48	8.52
8.	Accommodation Costs	123,786.30	28.41	123,786.30	30.51
9.	Tuition	89,851.38	20.62	59,754.87	14.73
	Total	**₦435,788.88**		**₦405,692.37**	
Private University					
S/N	**Items**	**Freshmen**	**%**	**Returning Students**	**%**
1.	Feeding per session	90,960.48	6.87	90,960.48	6.87
2.	Health cost per session	40,511.88	3.06	40,511.88	3.06
3.	Textbooks per session	15,879.87	1.20	15,879.87	1.20
4.	Lecture handout per session	26,654.2	2.01	26,654.2	2.01
5.	Transport per session	33,169.04	2.50	33,169.04	2.50
6.	Rate for data plans per session	38,295.18	2.89	38,295.18	2.89
7.	Funds on laundry per session	7,529.12	0.57	7,529.12	0.57
8.	Accommodation Costs	130,506.02	9.86	130,506.02	9.86
9.	Tuition	940,682.79	71.04	940,682.79	71.04
	Total	**₦1,324,188.58**		**₦1,324,188.58**	

DISCUSSION

The demography of having more students on campus has changed over the years. More students now stay off campus for varying reasons, from overcrowding in on-campus residences to access to places where they can easily buy their necessities which are mostly unavailable[24] on campus. The results of this study revealed that there were more students on campus, which is at variance with the study of Auta and colleagues, who showed that more pharmacy students in the University of Jos, Nigeria were in private accommodation than in university accommodation.[25]

The value for the total tuition paid for the five years of undergraduate pharmacy education varied widely between public and private schools, with those in private schools paying three times more than those in the highest-paying public school. Osakwe and Ahunanya reported the same in their study on coping strategies of private universities.[26] This is expected since private universities are self-financing, usually without government or nongovernment support like grants, endowments, and charitable donations. They would

therefore include in detail every cost involved in training the student, which could be taken for granted in public schools, and this inadvertently increases the demand for miscellaneous payments from the students in public schools. The International Institute for Education Planning, in its report of a policy forum held in Georgia, reported that the backbone of private institutions is tuition fees.[27] The discrepancy observed, in the amount paid as tuition, between first-year (100-level) students and the higher classes (200-level to 500-level) in Pharmacy Schools is due to the multiple fees to be paid by First-year students, which do not apply to their counterparts in higher classes. Such as development levy, medical tests, acceptance fee, etc.)

This study also agreed with the report of Mattingly and Ulbrich, who identified accommodation and tuition costs as important costs to consider because they make up the highest percentage of the overall private cost of pharmacy education.[28]

Respondents in private schools significantly spent more than respondents in public universities on feeding, health care, textbooks, laundry, and accommodation. It is well known that accommodation costs in public universities are cheaper than in private universities because public universities in Nigeria have government support and accommodation is subsidized. Also, due to a large number of staff and staff housing in these public universities, some of the students stay with their parents and guardians on and off-campus. In most public universities, accommodation on campus is optional, but this is not so with the private universities surveyed, as all the respondents from private universities stayed on campus.

Respondents from private universities spent more on feeding when compared with their counterparts in public universities. Those in public universities save costs by cooking their own food whereas the high cost of meals in eateries coupled with the restrictions in private universities that discourage students from cooking in university hostels. This is not the case with public universities, where students save costs by cooking their own food.

Furthermore, it was observed that students in private universities spent more on healthcare than students in public universities. Healthcare is usually subsidized in public universities through various health insurance schemes, this is not available to students in private universities who have to pay in full for the healthcare they access. A typical example of such is the Tertiary Social Health Insurance Program (TISHIP) which caters to the healthcare needs of students in public schools (the cost of which is built into the school fees or other associated fees paid to the university). Some students in public universities however, do not access the free healthcare scheme available to them and spend money on medications and healthcare in private pharmacies and clinics. This might be because they are unaware of the scheme or deliberately choose to purchase their medications elsewhere because they do not have faith in the school's health facility.[29]

Private university respondents differed significantly in the amount they spent on textbooks from public university respondents. This could be attributed to free access to well-equipped libraries coupled with the mode of teaching adopted in government-owned universities that generally discourage sales of textbooks and handouts by lecturers, unlike in private universities where this may be mandatory. Also, the majority of respondents from public schools may spend less on textbooks because of access to electronic versions of the textbooks that are usually available at no cost. Having hard-copy textbooks is usually compulsory for students in private universities. Revenue from textbook sales is one of the ways private universities generate funds for running the institution. This result is consistent with previous reports in the literature.[23]

From this study, there was no significant difference in costs spent on lecture handouts in both public and private universities which could be related to the fact that both types of universities in Nigeria teach using the same curriculum; therefore, their materials are related, and the cost of attaining them is not really different.

It was also observed that there was no significant difference in transportation costs between public and private university respondents. Most of the respondents stayed on campus in public universities, while all the students stayed on campus in private universities. Given this distribution, the respondents will spend about the same amount on transportation since the commute distance will be shorter and less money will be spent. Also, most off-campus residences in public universities are located around the schools, reducing transportation costs.

The cost spent on data plans per session was not found to be significant across the schools because the demands of pharmacy education requiring data usage like class assignments, presentations and research are uniform

across the schools. Internet service rates are also uniform across the country, which would amount to similar costs for internet subscriptions by the respondents in both types of schools.

The cost of laundry services was significantly different across both types of schools, with the private universities being the least. Most private university students do their laundry by themselves, and there is the unavailability of laundry services within the school premises, unlike the public universities where laundry services are available at their beck and call, making it easier to spend more money.

Overall, the private cost of studying pharmacy was found to be highest for private universities and lowest for public universities. The 2019 federal government budget allocates just 7.05 per cent of the entire budget to education, which is lower than the international benchmark of 26 per cent, which accounts for the high education costs, particularly in private schools.[30] Someone will have to pay for education; if not the government, private pockets will.

Chingos inferred in his work that there had been heightened advocacy for increased federal government funding for public schools in recent times and suggested that this advocacy should extend to private schools too.[31] It is important to however consider the concerns of Ofem and Akinyemi (2012) about the affordability of undergraduate education.[21] They asserted that with the increasing cost of education, low-income households would not be able to assess the benefits of education since they can't pay for it unless they have access to scholarships. Also, the number of years the students spend in school should be considered particularly since students can repeat one or more academic sessions in pharmacy, which would add to the existing cost of education as identified by Blagg and Blom (2018).[3]

CONCLUSION

The cost of undergraduate pharmacy education (for five academic sessions) was found to be ₦2,058,558.36 ($5,002.09) for public universities and ₦6,620,942.90 ($16,088.21) for private universities. Cost components of studying pharmacy include feeding, health, textbooks, handouts, transportation, internet data plans, laundry, accommodation, and tuition. In light of new economic realities like inflation and also effects of natural disasters, and man-made troubles, the costs of education have increased drastically. It is important to explore other means of funding for education in developing countries to encourage children of low-income earners to have a decent education. Moreso, the low pharmacy-to-population ratio necessitates more admissions of students into pharmacy schools.

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REFERENCES

1. Archibald R, Feldman D (2012). The Anatomy of College Tuition. The American Council on Education, 1-20. Available at: https://www.acenet.edu/Documents/Anatomy-of-College-Tuition.pdf. Accessed November 15, 2022
2. Riley RW, Robinson SP, Griffith JE. (n.d.). The Cost of Higher Education. National Centre for Education Statistics. US Department of Education Office of Educational Research and Improvement. 1-22. Available at: https://nces.ed.gov/pubs/96769.pdf. Accessed October 26, 2022.
3. Blagg K, Blom E (2018). Evaluating the Return on Investment in Higher Education: An Assessment of Individual and State-Level Returns. Urban Institute 1: 20. Available at: https://www.urban.org/sites/default/files/publication/99078/evaluating_the_return_on_investment_in_higher_education.pdf. Accessed June 12, 2021.
4. Njoroge SN (2013). Influence of Hidden Costs in Education on Academic Performance in Public Primary Schools in Gatanga District, Kenya [University of Nairobi]. Available at: http://erepository.uonbi.ac.ke/bitstream/handle/11295/56010/Njoroge_Influence%20of%20hidden%20costs%20in%20education.pdf?sequence=3andisAllowed=y. Accessed June 12, 2021
5. UNESCO Education Sector (2020). Right to education handbook. Paris: UNESCO and Right to education. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000366556. Accessed January 10, 2022.
6. Doctorly (n.d.): Cost vs reward of a pharmacist education. Available at: https://doctorly.org/cost-vs-

reward-of-a-pharmacist-education. Accessed January 15, 2021
7. Pharm.D. Tuition Trends. (2016). In Tableau Public. AACP - Office of Institutional Research and Effectiveness. Available at: https://public.tableau.com/app/profile/aacpdata/viz/Pharm_D_TuitionTrends/TuitionData. Accessed July 15, 2022.
8. Donnelly D (2015). Determinants of College Enrollment in the State of Illinois. 29. Available at: https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1876andcontext=gs_rp. Accessed October 20, 2021
9. Ulbrich TR, Kirk LM (2017). It's Time to Broaden the Conversation About the Student Debt Crisis Beyond Rising Tuition Costs. *American Journal Pharmaceutical Education* 81(6): a101. https://doi.org/10.5688/ajpe816101
10. Nigeria Inflation Rate (October 2022 Data) 1996 - 2021. (2022). Available at: https://tradingeconomics.com/nigeria/inflation-cpi. Accessed November 12, 2022
11. Cain J, Campbell T, Congdon HB, Hancock K, Kaun M, Lockman PR, Evans L (2014). Complex Issues Affecting Student Pharmacist Debt. *American Journal Pharmaceutical Education* 78(7): a131. https://doi.org/10.5688/ajpe787131
12. Sasabowski MH, Gard PR (2009). Pharmacy Education in the United Kingdom. *American Journal Pharmaceutical Education* 72(6): a130. https://doi.org/10.5688/aj7206130
13. The University of Manchester. MPharm Pharmacy overview. https://www.manchester.ac.uk/study/undergraduate/courses/2022/01695/mpharm-pharmacy/. Accessed June 10, 2022.
14. University of Birmingham. MPharm Pharmacy (4-year). Available at: https://www.birmingham.ac.uk/undergraduate/courses/med/pharmacy-4-year.aspx. Accessed June 10, 2022.
15. Johnson JL, Spivey CA, Chisholm-Burns M (2021). Comparison of Black Student Enrollment in US Schools and Colleges of Pharmacy, Medicine, and Dentistry. *American Journal Pharmaceutical Education* 85(9), 8493. https://doi.org/10.5688/ajpe8493
16. Opendoors. New international student enrolment, (2021). Available at: https://opendoorsdata.org/data/international-students/new-international-students-enrollment/. Accessed June 12, 2022
17. Bailey B (2021). Nigerians' enrollment in US universities hits 3yr low (thousands). Business Day. Available at: https://businessday.ng/news/article/nigerians-enrolment-in-us-universities-hits-3yr-low/. Accessed October 20, 2022.
18. Debande O (2004). A Review of Instruments for Student Loans in Tertiary Education. *European Journal of Education* 39(2), 161-190. http://www.jstor.org/stable/1503882
19. Al-Suwailem AK (2021). Effect of the Pharmacy Staff Shortage on the Medication Safety. *Issues in Biological Sciences and Pharmaceutical Research* 9(2): 54-77. https://doi.org/10.15739/ibspr.21.007
20. Okebukola P (2002). The Status of University Education in Nigeria: A Report presented to the National Summit on Higher Education, Abuja: March 11-16.
21. Ofem IB, Akinyemi S (2012). Private Cost of Bachelor's Degree Programs by Major Fields in Nigeria. *Journal of Studies in Education* 2(2): 255-262. https://doi.org/10.5296/jse.v2i2.1621
22. Bukhari SA (2021). Sample Size Determination Using Krejcie and Morgan Table. Available at: https://doi.org/10.13140/RG.2.2.11445.19687. Accessed October 21, 2019
23. Bailey C, Falls GA, Natke PA, Thompson PB (2008). Local Spending by Traditional College Students: A Descriptive Case Study. B-Quest. Available at: https://www.westga.edu/~bquest/2008/local08.pdf. June 12, 2021.
24. Abdul Razak F, Shariffuddin N, Mohd Padil H, Hanafi, N. (2017). Phenomenon Living in Off-Campus Accommodation among UiTM Students. *International Journal of Academic Research in Business and Social Sciences* 7(6): 786-796.
25. Auta A, Banwat SB, Sariem CN, Shalkur D, Nasara B, Atuluku MO. (2012). Medicines in Pharmacy Students' Residence Self-medication Practices. *Journal of Young Pharmacists* 4(2): 119-123. https://doi.org/10.4103/0975-1483.96627
26. Osakwe T, Ahunanya S (2012). Private Universities in Nigeria: Emergent Realities and Coping Strategies. *Journal of Emerging Trends in Educational Research and Policy Studies* 3(5): 695-700. https://www.semanticscholar.org/paper/Private-Universities-in-Nigeria%3A-Emergent-Realities-Ahunanya/542642800ac2ea64b6524e21e4906355cb6f4506
27. UNESCO IIEP. (2022). Education in emergencies; The challenge of reconstruction. *International Institute*

for Educational Planning 20(3): 1-5. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000192877. Accessed January 10, 2022.

28. Mattingly TJ, Ulbrich TR (2017). Evaluating the Changing Financial Burdens for Graduating Pharmacists. *American Journal of Pharmaceutical Education* 81(7): a5990. https://doi.org/10.5688/ajpe8175990
29. Anetoh MU, Jibuaku CH, Nduka O, Uzodinma SU (2017). Knowledge and implementation of Tertiary Institutions' Social Health Insurance Program (TISHIP) in Nigeria; a case study of Nnamdi Azikiwe University, Awka. *Pan African Medical Journal* 28: 171. https://doi.org/10.11604/pamj.2017.28.171.11379
30. BudgIt (2019). Proposed 2019 Budget Analysis. Available at:. www.yourbudgit.com. Accessed October 5, 2019.
31. Chingos MM (2017). Don't forget private, non-profit colleges. *Evidence Speaks* 2(9): 1-9. https://www.brookings.edu/wp-content/uploads/2017/02/es_20170216_chingos_evidence_speaks.pdf