

## RESEARCH ARTICLE

## PHARMACY SERVICES, WATER, SANITATION AND PHYSICAL AMENITIES: CAREGIVERS' PERSPECTIVES FROM A TERTIARY HOSPITAL IN NIGERIA

Ohonsi Abimbola Ajoke<sup>1,2,\*</sup> , Olugbemide Orebowale Adebimpe<sup>2,3</sup> , Oyewusi Magdalene Ayienale<sup>1,2</sup> , Alli Jeremiah Samuel<sup>1</sup> , and Otaigbe Osahon Inegbenoise<sup>2,4</sup> <sup>1</sup> Dept. of Paediatrics, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria<sup>2</sup> Ambrose Alli University, Ekpoma, Edo State, Nigeria<sup>3</sup> Dept. of Internal Medicine, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria<sup>4</sup> Dept. of Community Medicine, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria\*Corresponding author: Ohonsi Abimbola Ajoke; E-mail: [ajoke.ekunsumi@aauekpoma.edu.ng](mailto:ajoke.ekunsumi@aauekpoma.edu.ng); Tel: +2348034993151

Received: 15 July 2026 / Accepted: 18 August 2026 / Published online: 30 September 2026

## Abstract

Assessing satisfaction is essential for improving hospital service delivery, particularly Good Pharmacy Practice and the care environment, including water, sanitation, and basic amenities, is now recognized as core to health system performance. In Nigeria, routine satisfaction surveys are uncommon despite SERVCOM, and family caregivers who commonly support inpatient care and can judge services are infrequently surveyed. This study assessed caregivers' perspectives on pharmacy services and selected amenities at Irrua Specialist Teaching Hospital (ISTH). Irrua Specialist Teaching Hospital (ISTH) is a 435-bed federal tertiary facility in Edo State. A three-month cross-sectional descriptive survey (March–May 2025) was conducted among caregivers of inpatients in female medical, male medical, and paediatric wards who had used hospital services for at least 48 hours and consented. Using interviewer-administered structured questionnaires, 151 caregivers were recruited through proportionate ward allocation and random selection; amenity items (kitchen, lighting, water, toilet) showed good reliability (Cronbach's  $\alpha=0.85$ ). Analyses (descriptive statistics, chi-square, and forward stepwise multivariable logistic regression) showed caregivers' mean age was  $39.7 \pm 12.7$  years; 74.8% were female and 45.0% had tertiary education. Patients' ages ranged from <1 to 95 years (median 38; IQR 6–64), 29.8% were  $\geq 60$  years, median admission duration was 10.5 days (IQR 5–18), and 53.8% were admitted for NCDs. Pharmacy staff care was satisfactory for 68.2%, but obtaining medicines was often difficult due to perceived drug unavailability and higher hospital pharmacy costs. Satisfaction differed by illness type ( $p=0.016$ ); NCD admission predicted dissatisfaction versus infectious disease (aOR 3.75, 95%CI 1.54–9.08), while caregiver age 40–59 years reduced odds versus 18–39 years (aOR 0.32, 95%CI 0.13–0.75); model  $p<0.001$ . Lighting rated highest; water, kitchen, and toilets lowest. Strengthening medicine supply systems and addressing WASH and support services are actionable priorities to improve caregiver-perceived quality and patient-centred inpatient care in under-resourced settings.

**Keywords:** Patient satisfaction; Pharmaceutical care; Physical facilities; Caregivers' perspectives; Water; Sanitation.

## Introduction

Patient satisfaction assessments are essential instruments for evaluating the quality of healthcare service delivery in hospitals [1]. Client satisfaction is the level of satisfaction that clients experience having used a service. It therefore reflects the gap between the expected service and the experience of the service, from the client's point of view [1]. Numerous studies have identified factors

contributing to patient satisfaction, including the clinic environment [1], the registration process [2], and pharmacy services [2]. However, Good Pharmacy Practice (GPP) serves as the foundation for ensuring the delivery of high-quality pharmaceutical care services [3]. GPP aims to facilitate optimal patient outcomes and satisfaction as defined by established standards and guidelines [4]. According to the World Health Organization (WHO) guidelines, a pharmacist's primary

responsibility is the welfare of patients [4]. This includes helping patients make the best use of medicines, contributing to rational and cost-beneficial prescribing and dispensing, and ensuring that pharmacy service objectives are relevant and properly communicated to patients [4]. Evaluating the quality of pharmaceutical care is essential to align Good Pharmacy Practice (GPP) with the current pharmaceutical care approach [3]. In Nigeria, a study at the University of Benin Teaching Hospital revealed subpar levels of patient satisfaction with current pharmaceutical services [5]. Conversely, another study conducted across eight public secondary and tertiary hospitals in Northwestern Nigeria [6] suggested relatively high levels of respondent satisfaction with medication counseling, despite a limited understanding of their prescribed medications. Globally, numerous studies on patients' satisfaction with pharmacy services have been conducted. A study in Palestine [7] highlighted the potential for enhancing patient satisfaction, suggesting the implementation of a robust system and the integration of technological advancements, such as electronic prescribing and medication management systems, for the continuous evaluation and improvement of pharmaceutical care services within hospitals to ensure optimal patient care quality [7]. Another study in Saudi Arabia reported high (88.1%) levels of client satisfaction with hospital pharmacy services [8]. While studies conducted in public hospitals in Eastern Ethiopia revealed notably low levels of patient satisfaction with pharmacy services [9], a study at Woldia Comprehensive Specialized Hospital (WCSH), Ethiopia, demonstrated that only about half of the patients reported satisfaction with the pharmacy service [10]. Tangible dimensions play a significant role in influencing patient satisfaction with services provided by the hospital [11]. These dimensions comprise physical infrastructure, including facility amenities such as waiting rooms, food services, beds, pharmaceutical services, toilet facilities, and the cleanliness and maintenance of these facilities, all of which significantly influence patients' perceptions of the quality of services provided in hospitals [11-13]. Reliable access to water is essential for the efficient operation of hospitals, as water shortages can significantly disrupt critical functions [14]. Consequently, the Sustainable Development Goals (SDGs) have redefined Water, Sanitation, and Hygiene (WASH) as both an outcome and a driver of health, equity, and climate resilience, underscoring the importance of safely managed services as the highest desired level of service for water and sanitation to prevent disease [15]. Progress in WASH provision within healthcare settings is currently being monitored as part of the SDGs [16]. In a study conducted in Kazakhstan, some respondents reported that the water supply source was unreliable [17], while in Ethiopia [18], 81.5% reported dissatisfaction with toilet cleanliness. This study is necessitated by the need to integrate

feedback from periodic patient satisfaction surveys into service enhancement plans within the hospital, as key attributes of healthcare valued by patients are often patient-centered. In African countries, the involvement of family caregivers in the care of acutely ill inpatients is a prevalent practice, and our centre is no exception [19]. Family members are often responsible for the care of their ill relatives both at home and when admitted to healthcare facilities. They are well-positioned to make informed decisions regarding the care their wards or relatives receive [20], yet they are infrequently surveyed.

Despite the recent introduction of the Service Compact with All Nigerians (SERVICOM) for the purpose of improving service delivery in the public sector [21], periodic patient satisfaction surveys are not yet customary in our hospitals. Furthermore, the experiences of patients in one setting may serve as a valuable source of learning to enhance healthcare delivery in other settings.

## Methodology

### Study Area

ISTH is a 435-bed Federal Tertiary facility that receives patients from other primary, secondary and tertiary health facilities.

### Study Population

The study participants were caregivers of the inpatients from Female Medical Ward, Male Medical Ward and Paediatric Medical ward.

### Inclusion Criteria

The caregivers to be interviewed should have had contact with the Hospital services for at least 48 hours, so as to be able to make objective informed decision about health service delivery available

and Caregivers who give informed consent.

The sample size estimated for the study was 151 patients, computed following the formula for calculating sample size for finite population  $n = Z^2pq/d^2$

Where n is the sample size.

The Z-score corresponding to desired confidence level value is 1.96 for a 95% confidence level

P= The estimated proportion of an attribute present in the population. This is 52.4% [22 share the same epidemiological characteristics and within the same state of the index study]

$q=1-p$

d=The desired margin of error expressed as 5% (0.05)

$n= 383$

then using the formula for finite population correction ( $no = n/1 + n - 1/N$ )

no = corrected sample size, n=sample size while N sample size of total population derived from ref [22] above=185

$383/1 + 383 - 1/185$

no= 125

However, 10% was added to cater for non-response (10% of 125 = 12.5).

no= 125+12.5 = 137.5, This was rounded up to 151

The proportionate allocation formula was used to calculate specific numbers to sample from each ward thus:

Total admissions into these wards in 2024 was 2,181, while admissions into Male Medical ward, female medical ward and paediatric ward were 770, 638, 773 respectively.

$nh = Nh * n$

N

(nh is sample size using proportionate allocation method, Nh is total population of the ward, N is total population of the 3 wards, while n is derived sample size

nh for Female medical ward is  $638/2181 * 151 = 44$

nh for Male Medical ward is  $770/2181 * 151 = 53$

nh for Paediatric ward is  $773/2181 * 151 = 54$

Following this random selection of participants was carried out in respective wards until allocated sample sizes in the respective Wards were reached.

### Study Design

Cross-sectional descriptive study.

### Duration of Study

The study was conducted over a period of three months (March to May 2025)

### Recruitment Method

Random selection of eligible participants was used to recruit caregivers of inpatients in female medical ward, Male medical ward and Paediatric Ward until allocated sample sizes in the respective Wards were met.

In each ward, caregivers were interviewed using an interviewer administered structured questionnaires.

### Ethical considerations

Approval for this study was obtained from the hospital and ethics committee of ISTH with Protocol no: ISTH/HREC/20240912/626, after permission has been granted by the hospital management. Informed consent was obtained from caregivers of inpatients.

### Data analysis

Filled questionnaires were entered and analysed using Stata version 17. Frequency distribution tables and chi-square analysis was done and p-value < 0.05 was considered significant. Descriptive statistics were used to compute percentages, proportions, means and averages. Chi square test was used for associations of factors. Multivariable logistic regression was performed using a forward stepwise selection approach. Cronbach Alpha Coefficient was used to test the reliability of questionnaires and was used to assess caregivers' satisfaction with basic hospital amenities.

## Results

The 151 participants in this study were caregivers of patients who had a mean age of  $39.7 \pm 12.7$  years. About three-quarters were female, and 45.0% had tertiary level of education (Table 1).

**Table 1:** Sociodemographic characteristics of family caregivers

| Variable                                       | Frequency (n=151) | Percent (%) |
|------------------------------------------------|-------------------|-------------|
| <b>Age of family caregiver (years)</b>         |                   |             |
| 18 – 39                                        | 83                | 55.0        |
| 40 – 59                                        | 55                | 36.4        |
| ≥ 60                                           | 13                | 8.6         |
| Mean age ± SD                                  | $39.7 \pm 12.7$   |             |
| <b>Sex of family caregiver</b>                 |                   |             |
| Female                                         | 113               | 74.8        |
| Male                                           | 38                | 25.2        |
| <b>Level of education of primary caregiver</b> |                   |             |
| No formal education                            | 8                 | 5.3         |
| Primary                                        | 18                | 11.9        |
| Secondary                                      | 57                | 37.8        |
| Tertiary                                       | 68                | 45.0        |

SD=standard deviation

The patients aged between <1 year and 95 years, with a median age of 38 years (interquartile range [IQR]: 6-64 years). Elderly patients (aged 60 years and above) accounted for approximately 30% of the patient population. Christianity was the predominant religion among the patients. The median duration of hospital admission was 10.5 days (IQR: 5-18 days). More than half of the patients (53.8%) were admitted for non-communicable diseases (Table 2).

**Table 2:** Patient characteristics

| Variable           | Frequency (n=151) | Percent (%) |
|--------------------|-------------------|-------------|
| <b>Age (years)</b> |                   |             |
| < 1                | 9                 | 6.0         |
| 1 – 5              | 27                | 17.9        |
| 6 – 17             | 17                | 11.3        |
| 18 – 39            | 26                | 17.2        |
| 40 – 59            | 27                | 17.9        |
| ≥ 60               | 45                | 29.8        |
| Median (IQR) age   | 38 (6, 64)        |             |
| <b>Sex</b>         |                   |             |
| Female             | 62                | 41.1        |
| Male               | 89                | 58.9        |
| <b>Religion</b>    |                   |             |
| Christianity       | 136               | 90.1        |
| Islam              | 15                | 9.9         |

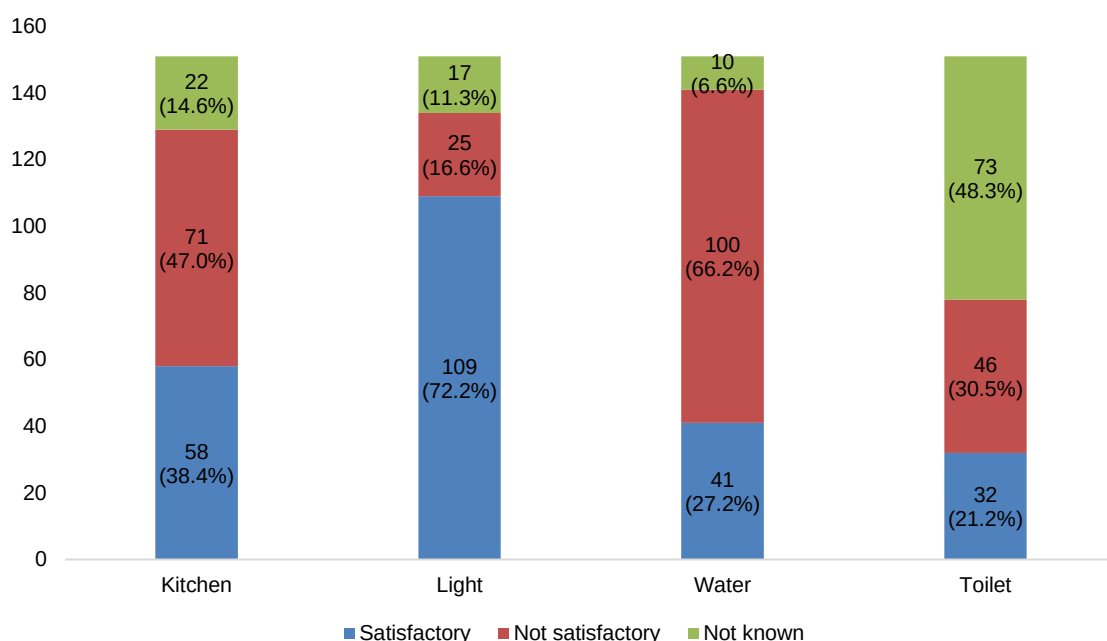
Lighting received the highest satisfaction rating, with 109 respondents (72.2%) reporting it as satisfactory, while 25 (16.6%) reported dissatisfaction and 17 (11.3%) were uncertain. In contrast, only 41 respondents (27.2%) were satisfied with water supply, whereas 100 (66.2%) expressed dissatisfaction and 10 (6.6%) were uncertain.

For kitchen facilities, 58 respondents (38.4%) reported satisfaction, 71 (47.0%) were not satisfied, and 22 (14.6%) were uncertain. Toilet facilities had the lowest proportion of satisfaction, with only 32 respondents (21.2%) expressing satisfaction, 46 (30.5%) expressing dissatisfaction, and 73 (48.3%) indicating uncertainty (Figure 1).

The most recommended suggestion was regular supply of drugs (91.4%) followed by provision of basic amenities (84.8%). Others include retraining of staff (83.4%), recruitment of staff (74.2%), and attitudinal change of staff (72.2%). (Figure 2)

The proportion of respondents who rated the pharmacy staff as satisfactory was 68.2%, while nearly one-third (31.8%) rated the care received from pharmacy services as bad.

On bivariate analysis, nature of illness was found to be significantly associated with satisfaction with pharmacy services. There was a greater proportion of those who reported satisfaction with pharmacy services among caregivers of patients with infectious diseases compared to caregivers of patients with non-communicable diseases and neoplasms (Table 3).

**Fig. 1:** Respondents' opinion of provision of basic amenities

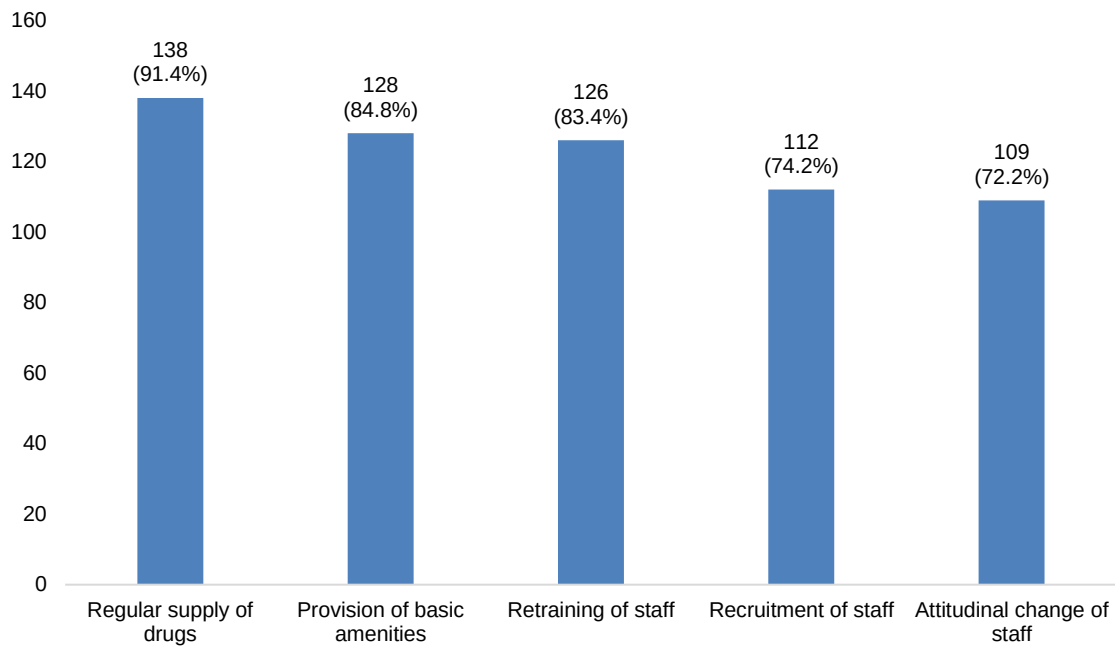


Fig. 2: Respondents' suggestions to improve services (multiple responses)

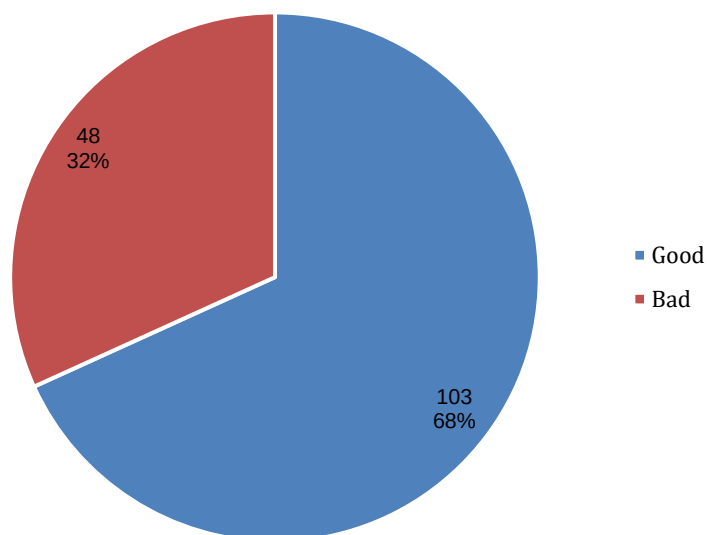


Fig. 3: Proportion of respondents rating pharmacists' quality of care as good or bad

**Table 3:** Respondent's characteristics and satisfaction with pharmacy services

| Variable                                       | Satisfactory<br>n (%) | Not satisfactory<br>n (%) | $\chi^2$ | df | P     |
|------------------------------------------------|-----------------------|---------------------------|----------|----|-------|
| <b>Age of family caregiver (years)</b>         |                       |                           |          |    |       |
| 18 – 39                                        | 52 (62.6)             | 31 (37.4)                 | 2.876    | 2  | 0.237 |
| 40 – 59                                        | 42 (76.4)             | 13 (23.6)                 |          |    |       |
| ≥ 60                                           | 9 (69.2)              | 4 (30.8)                  |          |    |       |
| <b>Sex of family caregiver</b>                 |                       |                           |          |    |       |
| Female                                         | 76 (67.3)             | 37 (32.7)                 | 0.189    | 1  | 0.664 |
| Male                                           | 27 (71.1)             | 11 (28.9)                 |          |    |       |
| <b>Level of education of primary caregiver</b> |                       |                           |          |    |       |
| Primary education & below                      | 20 (76.9)             | 6 (23.1)                  | 1.206    | 2  | 0.547 |
| Secondary                                      | 37 (64.9)             | 20 (35.1)                 |          |    |       |
| Tertiary                                       | 46 (67.6)             | 22 (32.4)                 |          |    |       |
| <b>Religion of family caregiver</b>            |                       |                           |          |    |       |
| Christianity                                   | 91 (66.9)             | 45 (33.1)                 | 1.067    | 1  | 0.302 |
| Islam                                          | 12 (80.0)             | 3 (20.0)                  |          |    |       |
| <b>Days on admission</b>                       |                       |                           |          |    |       |
| ≤ 7                                            | 40 (67.8)             | 19 (32.2)                 | 5.552    | 3  | 0.136 |
| 8 – 14                                         | 35 (77.8)             | 10 (22.2)                 |          |    |       |
| 15 – 21                                        | 15 (68.2)             | 7 (31.8)                  |          |    |       |
| > 21                                           | 12 (50.0)             | 12 (50.0)                 |          |    |       |
| <b>Ward</b>                                    |                       |                           |          |    |       |
| Female medical ward                            | 27 (61.4)             | 17 (38.6)                 | 2.299    | 2  | 0.317 |
| Male medical ward                              | 36 (67.9)             | 17 (32.1)                 |          |    |       |
| Paediatric ward                                | 40 (74.1)             | 13 (25.9)                 |          |    |       |
| <b>Nature of illness</b>                       |                       |                           |          |    |       |
| Infectious disease                             | 49 (81.7)             | 11 (18.3)                 | 8.314    | 2  | 0.016 |
| Non-communicable disease                       | 48 (59.3)             | 33 (40.7)                 |          |    |       |
| Neoplasm                                       | 6 (60.0)              | 4 (40.0)                  |          |    |       |

$\chi^2$ =chi-square; df=degree of freedom

The four items (kitchen, Light, Water and Toilet) assessing caregivers satisfaction with basic hospital amenities demonstrated good internal consistency with a Cronbachh's alpha of 0.85.

**Table 4:** Multivariable logistic regression predicting the odds of reporting not satisfied with quality of pharmacist services

| Variable                               | Adjusted OR | 95% CI      | P     |
|----------------------------------------|-------------|-------------|-------|
| Illness: NCD vs infectious diseases    | 3.75        | 1.54 – 9.08 | 0.003 |
| Age of caregiver: 40-59yrs vs 18-39yrs | 0.32        | 0.13 – 0.75 | 0.009 |

OR=odds ratio; CI=confidence interval;  
NCD=Non-communicable diseases

Caregivers of patients admitted for non-communicable diseases had significantly higher odds of reporting dissatisfaction with quality of pharmacy services

compared to caregivers of patients admitted for infectious disease (aOR=3.75, 95%CI=1.54-9.08, p=0.003). Caregivers aged 40 to 59 years were less likely to report dissatisfaction compared to those aged 18 to 39 years (aOR=0.32, 95%CI=0.13-0.75, p=0.009).

The overall model was statistically significant (p<0.001) with a Pseudo R<sup>2</sup> of 0.151 which suggests a modest but meaningful contribution of the included predictors.

## Discussion

This study assessed the perceptions and satisfaction levels of primary caregivers concerning Pharmacy and Physical facilities at a tertiary hospital in Edo State. The study comprised 151 participants, with a mean age of 39.7 ± 12.7 years. The findings revealed that the majority of caregivers were female and identified as Christians. Understanding patient satisfaction is essential, as it reflects the healthcare system's effectiveness in meeting

patient expectations. In this study, satisfaction with pharmaceutical care services was evaluated, showing that 68.2% of caregivers rated the service as good. However, 38.4% and 9.3% of participants reported that purchasing drugs at the pharmacy was difficult and very difficult, respectively. This figure is lower than that reported in Palestine [7], where 70% of subjects experienced difficulty obtaining prescribed drugs, this was attributed to the Palestinian healthcare system's financial constraints and out-of-pocket payment requirements. Approximately half of the caregivers (54.3%) expressed satisfaction with the pharmacy service [10]. Lower satisfaction levels (46.19%) were reported in Ethiopia [9], which also reported a low rating for the pharmacist-patient relationship. Reports from various regions of Nigeria indicated disparities in satisfaction levels across the country. For instance, a public hospital in the South-South [23] reported that 26% of respondents were able to obtain all their prescribed medicines at the pharmacy, with a satisfaction level of 59%. While the current study utilized an inpatient pharmacy, the aforementioned study employed an outpatient pharmacy, and the hospital management's vested interest in financial gains may have contributed to this difference. In the South-West [2] and South-South regions [5], satisfaction levels with pharmaceutical services were 57.7% and 49%, respectively. In contrast, the South-East [3] reported a low rating of 2.63 regarding the availability of prescribed medications. A study in Lagos [23] indicated that pharmacists' interpersonal skills received the lowest rating, suggesting a need for improvement in pharmacist-client relationships. A high satisfaction rating with pharmaceutical services (88.1%) was reported in Saudi Arabia [8], possibly due to the substantial investment by the government in healthcare services. In this study Caregivers of patients admitted for non-communicable diseases significantly higher odds of reporting dissatisfaction with quality of pharmacy services compared to caregivers of patients admitted for infectious disease, this might be due to more availability of drugs used in infectious conditions and vice versa. These figures could be improved, as Nigeria, like many other low- and middle-income countries, has a suboptimal healthcare system [24,25]. Primary healthcare centers in the country are largely non-functional and face challenges such as inadequate availability of qualified staff, essential medical supplies, and medicines [24,25]. Apart from providing clinical services, the fundamental purpose of hospital pharmacies is to efficiently and safely supply medicines [7]. The provision of drug therapy by a responsible pharmacist aims to achieve a specific outcome that enhances the patient's quality of life. This involves direct interaction between the pharmacist and the patient, with the objective of optimizing the patient's health-related quality of life and achieving positive clinical outcomes within realistic economic constraints [7].

In our study, the primary challenges identified included the unavailability of prescription drugs and the perception of higher medication costs at hospital pharmacies compared to community pharmacies. This situation necessitates urgent intervention by all stakeholders, including pharmacists. It is important to recognize that differences in healthcare systems and perceptions across various healthcare settings, as this can lead to varying levels of satisfaction. While pharmaceutical care as a practice philosophy has been established in developed countries for decades, in Nigeria, it is still emerging and requires continuous evaluation and improvement [26]. The physical facilities assessed in this study included lighting, kitchen services, and the availability of water and toilet facilities. Among these, the availability of water received the highest dissatisfaction score (66.2%), with only 21.2% of respondents indicating satisfaction. [11], Identified food and water as major components of hospitality in hospitals. Access to water, wastewater management, and proper hygiene practices are crucial for ensuring the delivery of high-quality healthcare services in hospitals. The 66.2% dissatisfaction rate with the water supply in the hospital is concerning, as a reliable water supply is essential for providing safe services [14,15]. In Kazakhstan, a lower dissatisfaction figure of 28.3% was reported, as respondents indicated that the water supply source was unreliable [17]. In contrast, a study in Indonesia found that 97.37% of water assessments across all hospital levels reported a good status, which was attributed to substantial government funding and improved infrastructure [27]. The dissatisfaction level of 30.5% with toilet facilities in this survey is significantly lower than the 81.5% dissatisfaction value obtained in Ethiopia [18]. The dissatisfaction in this study may be attributable to the poor status of water availability, as cleanliness, including that of toilets, is difficult to maintain without adequate water supply. Conversely, a study conducted in a general hospital in Nigeria reported that respondents were satisfied with the cleanliness of the toilets [12]. [28] in Ethiopia reported a dissatisfaction rate of 10.6%, which was a significant predictor of overall satisfaction levels.

In this study, 38.4% of respondents reported satisfaction with hospital meals, which was comparable to the 33.6% satisfaction level observed in Ethiopia [29]. In contrast, a significantly lower satisfaction rate of 22.7% was recorded in Bangladesh [30], while a notably higher satisfaction rate of 91% was reported in Pakistan [31]. Factors such as menu variety, sanitation, patients' perceptions of meal temperature, meal times, and meal taste have been identified as contributing to these varying satisfaction levels. The bias introduced by caregivers evaluation should not be underestimated as this might have influenced some of the outcomes obtained in this study. The 0.85 score obtained using Cronbachs however

demonstrated a good reliability and internal consistency in measuring the satisfaction of caregivers regarding these facilities.

Lighting is a critical component in healthcare settings, significantly influencing patients' physical and mental well-being [32]. A space cannot effectively serve its purpose without adequate lighting, which enables occupants to perceive their surroundings. In this study, a substantial proportion of respondents (72.2%) expressed satisfaction with the lighting, while 25 respondents (16.6%) reported dissatisfaction, and 17 (11.3%) were uncertain. Nigeria, like many other low- and middle-income countries, faces challenges with its healthcare system. For instance, a premier Nigerian teaching hospital reported experiencing 100 days without electricity, severely impacting essential services [33].

### Limitations

This study possesses certain limitations. The employment of proxies to evaluate the physical facilities in this study may introduce certain biases. However, these caregivers, being integral to the management of the patients, are well-positioned to make informed decisions regarding the care their wards or relatives receive as they partake of these facilities firsthand. The survey was conducted in a suburban area of Edo State, Nigeria, and the findings may not be generalizable to consumers and community pharmacists in other regions of the country. Our findings offer valuable insights previously lacking regarding perceptions and consumer concerns about the hospital pharmacy at our center, which will aid future planning and targeted interventions. Furthermore, the specific types of services received by patients in the hospital pharmacy and the physical facilities were not assessed, which may have influenced patient satisfaction levels. This limitation, however, forms the basis for future research.

### Conclusion

The findings of this study contribute to the understanding of key factors influencing patient satisfaction in hospitals. The study examined patients' perspectives on hospital pharmacy services and physical facilities, assessing their impact on patient satisfaction. The results suggested that the non-availability of prescription drugs and the perception of higher medicine costs at hospital pharmacies compared to community pharmacies are responsible for low satisfaction ratings. These findings underscore strengths in hospital cleanliness, particularly in clinical areas, while highlighting areas requiring improvement, such as toilets, water supply, and the kitchen. This study exemplifies the broader challenges faced by under-resourced health systems. Decisive action by relevant stakeholders is essential to prevent institutional failure and enhance patient satisfaction.

Attitudinal change, brought about by retraining of staff, including pharmacists and other support staff, is key to enhancing caregiver satisfaction.

### References

- [1] N. L. Alaro, "Assessment of Patient Satisfaction in an Out Patient Department of Rumbek East County, South Sudan," *TEXILA INTERNATIONAL JOURNAL OF PUBLIC HEALTH*, vol. 7, no. 3, pp. 9–14, Sep. 2019, doi: <https://doi.org/10.21522/tijph.2013.07.03.art002>.
- [2] E. A. Bamise, A. T. Agbele, and C. O. Adebayo, "Evaluating Patients' Level of Satisfaction on the Quality of Health Services in Ekiti State University Teaching Hospital, Ado-Ekiti Nigeria," *Asian Journal of Medicine and Health*, pp. 79–90, Jan. 2021, doi: <https://doi.org/10.9734/ajmah/2020/v18i1130271>.
- [3] M. C. Agu *et al.*, "Clients' satisfaction with the services of an outpatient pharmacy at a university hospital in Nigeria: a cross-sectional study," *Discover Public Health*, vol. 22, no. 1, Apr. 2025, doi: <https://doi.org/10.1186/s12982-025-00595-6>.
- [4] Organizatia Mondiala a Sanatatii FI a F. Joint FIP/WHO guidelines on good pharmacy practice: Standards for quality of pharmacy services. WHO Technical Report series. 2011;Annex 8(961):310–23.
- [5] A. C. Oparah, E. F. O. Enato, and O. A. Akoria, "Assessment of patient satisfaction with pharmaceutical services in a Nigerian teaching hospital," *International Journal of Pharmacy Practice*, vol. 12, no. 1, pp. 7–12, Mar. 2004, doi: <https://doi.org/10.1211/0022357023204>.
- [6] S. N. Abdu-Aguye, K. S. Labaran, N. M. Danjuma, and S. Mohammed, "An exploratory study of outpatient medication knowledge and satisfaction with medication counselling at selected hospital pharmacies in Northwestern Nigeria," *PLOS ONE*, vol. 17, no. 4, p. e0266723, Apr. 2022, doi: <https://doi.org/10.1371/journal.pone.0266723>.
- [7] Hamzeh Al Zabadi, Renad Shraim, Raya Sawalha, and Abdulsalam Alkaiyat, "Outpatients satisfaction and perceptions toward pharmaceutical services in public and private hospitals in Palestine: a cross-sectional study," *Journal of pharmaceutical policy and practice*, vol. 16, no. 1, Dec. 2023, doi: <https://doi.org/10.1186/s40545-023-00608-2>.
- [8] A. F. Alshahrani and I. M. Dighriri, "Patients' Satisfaction With Medication Delivery Pharmacy Services in a Tertiary Hospital in Asir, Saudi Arabia: A Cross-Sectional Study," *Cureus*, Nov. 2023, doi: <https://doi.org/10.7759/cureus.48903>.

- [9] Y. Ayele, B. Hawulte, T. Feto, G. V. Basker, and Y. D. Bacha, "Assessment of patient satisfaction with pharmacy service and associated factors in public hospitals, Eastern Ethiopia," *SAGE Open Medicine*, vol. 8, p. 205031212092265, Jan. 2020, doi: <https://doi.org/10.1177/2050312120922659>.
- [10] Yabibal Berie Tadesse, Ashenafi Kibret Sendekie, Biset Asrade, Fentaw Girmaw, and Abebe Tarekgn Kassaw, "Pharmacists' Medication Counseling Practices and Knowledge and Satisfaction of Patients With an Outpatient Hospital Pharmacy Service," *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, vol. 60, Jan. 2023, doi: <https://doi.org/10.1177/00469580231219457>.
- [11] S. Bandara, W. D. Mel, and W. Fernando, "Impact of Hospital Services on Patient Satisfaction: With Reference to a Government Hospital in Sri Lanka," *International Journal of Research and Innovation in Social Science*, vol. VIII, no. III, pp. 2965–2976, 2024, doi: <https://doi.org/10.47772/ijriss.2024.803204>.
- [12] M. Umoke *et al.*, "Patients' satisfaction with quality of care in general hospitals in Ebonyi State, Nigeria, using SERVQUAL theory," *SAGE Open Medicine*, vol. 8, p. 205031212094512, Jan. 2020, doi: <https://doi.org/10.1177/2050312120945129>.
- [13] R. A. Kraska, M. Weigand, and M. Geraedts, "Associations between hospital characteristics and patient satisfaction in Germany," *Health Expectations*, vol. 20, no. 4, pp. 593–600, Jul. 2016, doi: <https://doi.org/10.1111/hex.12485>.
- [14] A. Kameli, Kazem Naddafi, R. Saeedi, M. J. Hosseinzadeh-Attar, and Abbas Ostadtaghizadeh, "Water crisis in hospitals: challenges, and recommendations– a qualitative study in Iran," *BMC Health Services Research*, vol. 25, no. 1, Jul. 2025, doi: <https://doi.org/10.1186/s12913-025-12989-y>.
- [15] WHO. World Health Organisation: *Health topics, Water, sanitation and hygiene*. Accessed: on 18<sup>th</sup> March 2026.[online]. Available: <https://www.who.int>teams>water-sanitation-and-health>
- [16] Unicef WHO. Scoping Study: *Preparing for SDG reporting of WASH in health care facilities in the East Asia and Pacific Region*, 2017. Accessed on 15<sup>th</sup> March 2026.[online]. Available: <https://washdata.org>report>jmp-2017-wash-hcf-eapro>
- [17] A. Omarova, "Patients' satisfaction with the current access to and the quality of WASH services in rural hospitals," *European Journal of Public Health*, vol. 33, no. Supplement\_2, Oct. 2023, doi: <https://doi.org/10.1093/eurpub/ckad160.1189>.
- [18] T. R. Woldeyohanes, T. E. Woldehaimanot, M. W. Kerie, M. A. Mengistie, and E. A. Yesuf, "Perceived patient satisfaction with in-patient services at Jimma University Specialized Hospital, Southwest Ethiopia," *BMC Research Notes*, vol. 8, no. 1, Jul. 2015, doi: <https://doi.org/10.1186/s13104-015-1179-8>.
- [19] K.Yakubu, Z. Malan, M.C.Colon-Gonzalez, &B. Mash, "Perceptions about family-centred care among adult patients with chronic diseases at a general outpatient clinic in Nigeria," *African Journal of Primary Health Care & Family Medicine*, vol.10, no.1, pp. 1–11,2018. <https://doi.org/10.4102/phcfm.v10i1.1739>.
- [20] J.N.Nkengasong, T.Raji, S.L.Ferguson, M.A.Pate, M.A.Williams, "Nursing leadership in Africa and health security,"*EClinicalMedicine*, vol.36, no.1, June.2021,100930. <https://doi.org/10.1016/j.eclinm.2021.100930>
- [21] K. Brown, N. Ryan, and R. Parker, "New modes of service delivery in the public sector – Commercialising government services," *International Journal of Public Sector Management*, vol. 13, no. 3, pp. 206–221, Jun. 2000, doi: <https://doi.org/10.1108/09513550010345955>.
- [22] F.R.Omoronyia, A.E.Ndiok, K.O.Enang, E.I. Obande, "Patients' satisfaction with psychiatric nursing care in Benin, Nigeria". *International Journal of Africa Nursing Sciences*, vol.14, no.1, pp.100282, Jan. 2021 . <https://doi.org/10.1016/j.ijans.2021.100282>
- [23] Aderemi-Williams RI, Musa PG, Soremekun RO, Adeyemi OC, Abah IO. "Perception of patients accessing out-patient pharmacy on the quality of pharmaceutical services in a tertiary health facility in Lagos," *Nigeria. Highland Medical Research Journal*, vol. 17, no. 1, Jun. 2017.
- [24] D. Adeloye *et al.*, "Health workforce and governance: the crisis in Nigeria," *Human Resources for Health*, vol. 15, no. 1, May 2017, doi: <https://doi.org/10.1186/s12960-017-0205-4>.
- [25] I. I. Omoleke and B. A. Taleat, "Contemporary issues and challenges of health sector in Nigeria," *Research Journal of Health Sciences*, vol. 5, no. 4, pp. 210–216, Jan. 2018, doi: <https://doi.org/10.4314/rejhs.v5i4.5>.

- [26] A. Udoh *et al.*, "Clinical pharmacy services provided in public sector hospitals in Nigeria: a national survey," *International Journal of Pharmacy Practice*, vol. 29, no. 5, pp. 471–479, Jul. 2021, doi: <https://doi.org/10.1093/ijpp/riab046>.
- [27] R. Purwandari, D. Daniel, and Firdaus Hafidz, "Analysis of water, sanitation, and hygiene facilities using the WASH-FIT approach and its relation to patient satisfaction and maternal mortality at hospitals in Indonesia," *Frontiers in Public Health*, vol. 12, Feb. 2024, doi: <https://doi.org/10.3389/fpubh.2024.1322470>.
- [28] N. Asamrew, A. A. Endris, and M. Tadesse, "Level of Patient Satisfaction with Inpatient Services and Its Determinants: A Study of a Specialized Hospital in Ethiopia," *Journal of Environmental and Public Health*, vol. 2020, no. 2, pp. 1–12, Aug. 2020, doi: <https://doi.org/10.1155/2020/2473469>.
- [29] M. Teka *et al.*, "Satisfaction with regular hospital foodservices and associated factors among adult patients in Wolaita zone, Ethiopia: A facility-based cross-sectional study," *PLOS ONE*, vol. 17, no. 3, p. e0264163, Mar. 2022, doi: <https://doi.org/10.1371/journal.pone.0264163>.
- [30] Md. Rifat Uddin *et al.*, "Patients' Satisfaction Regarding Dietary Service at Tertiary Hospitals," *Asian journal of medicine and health*, vol. 21, no. 9, pp. 128–139, Jul. 2023, doi: <https://doi.org/10.9734/ajmah/2023/v21i9867>.
- [31] S.Sadaf, A.A. Malik, A. Bilal, and A.Saeed, "Patient satisfaction regarding food and nutrition care in hospitals of Lahore," *Pakistan. Prog Nutr.* Vol. 20, pp. 248-56, Mar. 2018.
- [32] M. Zhang, S. Zhang, Q. Ban, "Study on the Design of Interior Lighting for the environmental satisfaction of patients in Wards. In international conference on sustainable buildings and structures towards a Carbon Neutral Future:" *The Proceedings of The 3rd International Conference on Sustainable Buildings and Structures* 2024. Vol. 393, pp. 107, Mar 2024. Springer Nature
- [33] M. J. Mustapha, V. A. Adeloye, F. B. Mustapha, and V. Femi-Lawal, "100 days without electricity at a Nigerian teaching hospital," *The Lancet*, vol. 405, no. 10483, pp. 975–976, Mar. 2025, doi: [https://doi.org/10.1016/s0140-6736\(25\)00370-8](https://doi.org/10.1016/s0140-6736(25)00370-8).

## Author information

ORCID 

Ohonsi Abimbola: [0009-0003-5290-663X](https://orcid.org/0009-0003-5290-663X)

Olugbemide Orebowale: [0000-0001-9176-8143](https://orcid.org/0000-0001-9176-8143)

Oyewusi Magdalene: [0009-0005-2980-471X](https://orcid.org/0009-0005-2980-471X)

Alli Jeremiah: [0009-0000-2841-4094](https://orcid.org/0009-0000-2841-4094)

Otaigbe Osahon: [0000-0002-5915-2792](https://orcid.org/0000-0002-5915-2792)

## الخدمات الصيدلانية والمياه والصرف الصحي والمرافق المادية: وجهات نظر مقدمي الرعاية في مستشفى من المستوى الثالث في نيجيريا

أوهونسي أيمبولو أجوكه<sup>1,2\*</sup>، أولوبغميدي أوريبول أديمبي<sup>3,2</sup>، أيووسي ماغداين أينيالي<sup>2,1</sup>، ألي جيريمياه صامويل<sup>1</sup>، و أوتاغيي أوساهون إينغبونيسي<sup>4,2</sup>

<sup>1</sup> قسم طب الأطفال، مستشفى إيروا التخصصي التعليمي، إيروا، ولاية إيدو، نيجيريا

<sup>2</sup> جامعة أمبروز الي، إكبوما، ولاية إيدو، نيجيريا

<sup>3</sup> قسم الطب الباطني، مستشفى إيروا التخصصي التعليمي، إيروا، ولاية إيدو، نيجيريا

<sup>4</sup> قسم طب المجتمع، مستشفى إيروا التخصصي التعليمي، إيروا، ولاية إيدو، نيجيريا

\* الباحث الممثل: أوهونسي أيمبولو أجوكه؛ البريد الإلكتروني: [ajoke.ekunsumi@aauekpoma.edu.ng](mailto:ajoke.ekunsumi@aauekpoma.edu.ng)؛ الهاتف: +2348034993151

استلم في: 15 يوليو 2026 / قبل في: 18 أغسطس 2026 / نشر في: 30 سبتمبر 2026

### المُلخَص

يُعد تقييم رضا المستفيدين عنصراً أساسياً لتحسين تقديم الخدمات الصحية في المستشفيات، ولا سيما فيما يتعلق بممارسات الصيدلة الجيدة وبيئة الرعاية الصحية، بما يشمل المياه والصرف الصحي والمرافق الأساسية، التي يُعترف بها بوصفها مكونات جوهرية لأداء النظم الصحية. وفي نيجيريا، لا تزال الاستطلاعات الدورية لقياس رضا المستفيدين محدودة الانتشار، على الرغم من وجود برنامج SERVICOM، كما أن مقدمي الرعاية الأسرية، الذين يضطلعون عادةً بدور مهم في دعم رعاية المرضى الداخليين ويمثلون القدرة على تقييم الخدمات المقدمة، نادراً ما تشملهم هذه الاستطلاعات. هدفت هذه الدراسة إلى تقييم وجهات نظر مقدمي الرعاية بشأن الخدمات الصيدلانية ومجموعة مختارة من المرافق الأساسية في مستشفى إيروا التخصصي التعليمي (ISTH). ويُعد هذا المستشفى مؤسسة صحية اتحادية من المستوى الثالث، تضم 435 سريرًا، وتقع في ولاية إيدو بنيجيريا. أجريت دراسة وصفية مقطعية على مدى ثلاثة أشهر، خلال الفترة من مارس إلى مايو 2025، وشملت مقدمي الرعاية للمرضى المنومين في أجنحة الباطنة للنساء والرجال وطب الأطفال، ممن استخدموا خدمات المستشفى لمدة لا تقل عن 48 ساعة ووافقوا على المشاركة في الدراسة. وجرى استقطاب 151 مقدم رعاية باستخدام استبيانات منظمة أُديرَت بواسطة باحثين مدربين، مع توزيع متناسب للمشاركين على الأجنحة واختيارهم عشوائياً. وأظهرت بنود تقييم المرافق الأساسية، التي شملت المطبخ والإضاءة والمياه ودورات المياه، مستوى جيداً من الثبات والموثوقية، حيث بلغ معامل ألفا كرونباخ 0.85. اعتمد التحليل الإحصائي على الإحصاءات الوصفية واختبار كاي تربيع (Chi-square)، بالإضافة إلى الانحدار اللوجستي متعدد المتغيرات التدريجي الأمامي (Forward Stepwise Multivariable Logistic Regression). بلغ متوسط عمر مقدمي الرعاية  $12.7 \pm 39.7$  سنة، وكانت نسبة الإناث 74.8%، في حين حصل 45.0% من المشاركين على تعليم جامعي أو أعلى. وتراوحَت أعمار المرضى بين أقل من سنة واحدة و95 سنة، بوسيط بلغ 38 سنة، ومدى ربعي (IQR) تراوح بين 6 و64 سنة. وشكّل المرضى الذين تبلغ أعمارهم 60 سنة فأكثر نسبة 29.8% من إجمالي المرضى. كما بلغ وسيط مدة الإقامة في المستشفى 10.5 أيام، بمدى ربعي تراوح بين 5 و18 يوماً، في حين بلغت نسبة المرضى الذين أدخلوا إلى المستشفى بسبب الأمراض غير السارية 53.8%. أبدى 68.2% من المشاركين رضاهم عن الرعاية المقدمة من العاملين في الصيدلية، إلا أن الحصول على الأدوية واجه صعوبات متكررة، ويُعزى ذلك إلى ما *perceived* من عدم توافر بعض الأدوية وارتفاع أسعارها في صيدلية المستشفى. اختلف مستوى الرضا باختلاف نوع المرض، وكان هذا الاختلاف ذا دلالة إحصائية ( $p=0.016$ ). كما ارتبط الدخول إلى المستشفى بسبب الأمراض غير السارية بارتفاع احتمالات عدم الرضا مقارنةً بالدخول بسبب الأمراض المعدية، حيث بلغت نسبة الأرجحية المعدلة (aOR) 3.75، بفاصل ثقة 95% تراوح بين 1.54 و9.08. وفي المقابل، ارتبطت الفئة العمرية لمقدمي الرعاية، من 40 إلى 59 سنة، بانخفاض احتمالات عدم الرضا مقارنةً بالفئة العمرية من 18 إلى 39 سنة، حيث بلغت نسبة الأرجحية المعدلة 0.32، بفاصل ثقة 95% تراوح بين 0.13 و0.75. وكان النموذج الإحصائي دالاً عند مستوى  $p$ .

**الكلمات المفتاحية:** رضا المرضى؛ الرعاية الصيدلانية؛ المرافق المادية؛ وجهات نظر مقدمي الرعاية؛ المياه؛ الصرف الصحي.

### How to cite this article:

O. A. Ajoke, O. O. Adebimpe, O. M. Ayienale, A. J. Samuel, and O. O. Inegbenoise, "PHARMACY SERVICES, WATER, SANITATION AND PHYSICAL AMENITIES: CAREGIVERS' PERSPECTIVES FROM A TERTIARY HOSPITAL IN NIGERIA", *Electron. J. Univ. Aden Basic Appl. Sci.*, vol. 7, no. 3, pp. 258-268, Sep. 2026. DOI: <https://doi.org/10.47372/ejua-ba.2026.3.552>



Copyright © 2026 by the Author(s). Licensee EJUA, Aden, Yemen. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY-NC 4.0) license.