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CULTURAL, ARCHITECTURAL, AND TECHNOLOGICAL DIMENSIONS OF INFORMAL CARE GIVING IN NIGERIAN HOSPITAL WARDS

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Abstract
Informal caregivers are vital to patient care in Nigerian hospital wards, yet cultural norms, hospital design, and technological support constrain their roles. This study investigates how these factors affect caregiver experiences and effectiveness. Using a cross-sectional design, data from 180 caregivers at three hospitals in Jos (Jos University Teaching Hospital, Bingham University Teaching Hospital, and Faith Alive Hospital) were collected via structured questionnaires. Results indicate that care giving is primarily performed by women aged 31–45, consistent with traditional gender roles. Key challenges include overcrowded wards, insufficient seating (affecting privacy and sanitation), and reliance on personal phones rather than hospital electronic systems for communication. Infrastructure adequacy was strongly associated with caregiver satisfaction, whereas culturally sensitive practices had a moderate positive effect. The findings highlight the need for hospital designs that include ergonomic spaces, adequate sanitation, private areas, digital communication tools, and culturally responsive policies. Incorporating architectural, technological, and cultural considerations into healthcare planning can reduce caregiver burden, promote family involvement, and improve patient outcomes. This research emphasises the importance of involving informal caregivers in health system reforms, especially in resource-limited settings.

Keywords: Informal caregivers, hospital architecture, cultural norms, digital health, family-centred care

1. Introduction
Informal caregivers are integral to healthcare delivery, particularly in resource-constrained settings like Nigeria, where hospital staffing and formal support systems are often limited (Adejoh et al., 2020; Dreier-Wolfgramm et al., 2017). These caregivers, frequently family members or close friends, provide emotional, physical, and logistical support, often taking on responsibilities that extend beyond basic assistance to complex decision-making regarding patient care (Dreier-Wolfgramm et al., 2017; Adejoh et al., 2021). Despite their critical role, informal caregivers frequently face significant challenges, including emotional stress, limited access to information, and insufficient physical facilities within hospital wards (Akosile, Banjo, Okoye, Ibikunle, & Odole, 2018; Price et al., 2020). Cultural norms heavily influence care giving practices in Nigeria. Familial duty and collective responsibility often shape caregivers' engagement, expectations, and

experiences, sometimes exacerbating stress when hospital environments fail to recognise these cultural roles (Adebayo et al., 2025). Similarly, the architectural design of hospital wards plays a crucial role in either supporting or hindering caregivers' effectiveness. Research shows that thoughtfully designed wards, which provide spaces for rest, privacy, and access to information, can significantly alleviate caregiver burden, whereas poorly designed facilities may exacerbate feelings of isolation and frustration (Stolt, Scott, Papastavrou, & Suhonen, 2021; Guisado-Fernández et al., 2019).

Furthermore, communication and information dissemination within hospital settings remain a persistent challenge. Caregivers often report inadequate access to updates about patients' conditions and care procedures, which can lead to heightened anxiety and reduced engagement (Hogan et al., 2022; Zhai et al., 2023). Technological interventions, including digital health tools, present opportunities to bridge this gap, but adoption is influenced by factors such as digital literacy, cultural attitudes, and institutional support (Bastoni et al., 2021; Guisado-Fernández et al., 2019).

This study examines the cultural and architectural factors affecting informal caregivers in Nigerian hospital wards, specifically at three hospitals in Jos: Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH), and Faith Alive Hospital. While the broad challenges faced by informal caregivers are acknowledged, there remains a significant gap in integrated empirical studies in Nigeria that examine how cultural expectations, physical architecture, and access to technology interact to shape daily care giving experiences and effectiveness. This study aims to address this gap by providing a comprehensive analysis of these three dimensions within the specific context of hospital wards in Jos, Nigeria.

The following four objectives guide this study:

1. To profile informal care givers and evaluate the primary challenges they face within hospital wards.
2. To assess the perceived adequacy of hospital ward infrastructure and its impact on care giving.
3. To examine the influence of cultural norms and the use of technology on care giving roles and communication.
4. To analyse the relationships between infrastructure adequacy, cultural support, and caregiver satisfaction.

The study is designed to answer the following four questions:

1. What is the key socio-demographic characteristics of informal caregivers and the predominant challenges they encounter?
2. How adequate are the architectural facilities (space, privacy, seating, sanitation) in supporting caregivers' needs?
3. How do cultural norms and available technology shape care giving responsibilities and communication patterns?
4. What is the relationship between the quality of ward infrastructure, institutional cultural support, and caregiver satisfaction?

By focusing on these objectives, this study explores the intersecting cultural, architectural, and technological considerations affecting informal caregivers in three hospitals in Jos: Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH), and Faith Alive Hospital. The findings aim to inform practical strategies for enhancing caregiver support through improved ward design, culturally sensitive policies, and integrated technological solutions.

2. Literature Review

2.1 The Role of Informal Care givers

Informal caregivers, commonly family members or close friends, form a critical component of healthcare delivery in Nigeria, particularly in hospitals where staff-to-patient ratios are low (Adejoh et al., 2021; Dreier-Wolfgramm et al., 2017). These caregivers perform a wide range of functions, including personal care, medication management, emotional support, and logistical coordination, often assuming responsibilities that extend into complex medical decision-making (Dreier-Wolfgramm et al., 2017). In the context of Nigerian hospitals such as Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH), and Faith Alive Hospital, caregivers are frequently indispensable in bridging gaps in formal healthcare provision, yet their contributions are often under-recognised (Adebayo et al., 2024)

2.2 Cultural Influences on Care giving

Cultural expectations and familial norms profoundly shape caregivers' experiences in Nigeria. Studies indicate that societal emphasis on family obligation and collective responsibility often places substantial pressure on caregivers, influencing both the intensity and duration of care (Abubakar, 2015; Galvin et al., 2018). Caregivers may experience psychological strain when hospital policies or ward environments fail to accommodate culturally rooted caregiving practices, leading to feelings of isolation, stress, and inadequacy (Price et al., 2020; Lew et al., 2025). Understanding these cultural dimensions is essential for designing interventions that respect and support caregivers' roles within the Nigerian healthcare context.

2.3 Architectural Considerations

The physical environment of hospital wards significantly impacts caregiver experiences. Research demonstrates that well-designed spaces featuring accessible rest areas, private consultation zones, and clear navigation can reduce caregiver stress and enhance their ability to provide care (Adebayo et al., 2024). Conversely, wards lacking in spatial organisation, privacy, or facilities for caregivers often exacerbate emotional and physical strain (Silaule et al., 2024). In Nigerian hospitals, where informal care giving is common, architectural adaptations that account for both patients and caregivers are critical for improving healthcare outcomes and caregiver well-being.

2.4 Information Needs and Communication

Effective communication is vital for informal caregivers to perform their roles efficiently. However, evidence shows that many caregivers experience gaps in access to information regarding patients' conditions, treatment plans, and hospital procedures (Kim et al., 2023; Nwagwu & Akanji, 2024). This lack of information can heighten anxiety, reduce confidence, and compromise care quality (Elf et al., 2017). Interventions aimed at improving communication, such as structured briefings, caregiver education programs, and accessible informational resources, are essential for empowering caregivers in Nigerian hospital wards.

2.5 Technology as a Support Tool

The integration of technology offers promising avenues for supporting informal caregivers. Digital health platforms, mobile applications, and telecommunication tools can provide real-time updates, instructional guidance, and psychosocial support (Bastoni et al., 2021; Guisado-Fernández et al., 2019). Nonetheless, successful adoption is influenced by caregivers' digital literacy, cultural acceptance of technology, and the availability of institutional support. In the context of Jos hospitals, leveraging technology could enhance caregivers' engagement, reduce stress, and improve overall patient care.

2.6 Knowledge Gaps

Despite recognition of informal caregivers' pivotal role, significant gaps remain in understanding their specific cultural and architectural needs within Nigerian hospital settings. Limited empirical evidence exists on how ward design in Jos-based hospitals affects caregiver well-being or how culturally sensitive interventions can be operationalised (Akosile et al., 2018; Price et al., 2019). Furthermore, there is a paucity of studies assessing the long-term impacts of care giving on mental health and the effectiveness of digital solutions in these settings.

Existing literature underscores the multifaceted challenges faced by informal caregivers in Nigeria, highlighting cultural, architectural, and informational dimensions that shape their experiences (Adejoh et al., 2020; Kalánková et al., 2020; Bastoni et al., 2021). This study seeks to address these gaps by examining caregivers' experiences in three Jos hospitals, JUTH, BUTH, and Faith Alive Hospital, focusing on how cultural norms, ward design, and technological support influence caregiving effectiveness and well-being.

3. Methodology

This study employed a descriptive cross-sectional research design to investigate the cultural and architectural factors influencing support for informal caregivers in hospital wards in Jos, Nigeria. A cross-sectional approach was considered appropriate as it allows for the collection of data from multiple respondents at a single point in time, providing a snapshot of caregivers' experiences, challenges, and perceptions across different hospital settings. This design enabled the identification of patterns and associations between hospital infrastructure, cultural expectations, and caregiver well-being without manipulating variables. The study was conducted in three hospitals in Jos, Plateau State, Nigeria: Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH), and Faith Alive Hospital figure 1. These hospitals were purposively selected for their high patient volumes, ward diversity, and prevalence of informal care giving practices. The target population comprised informal care givers, including family members and close friends, who

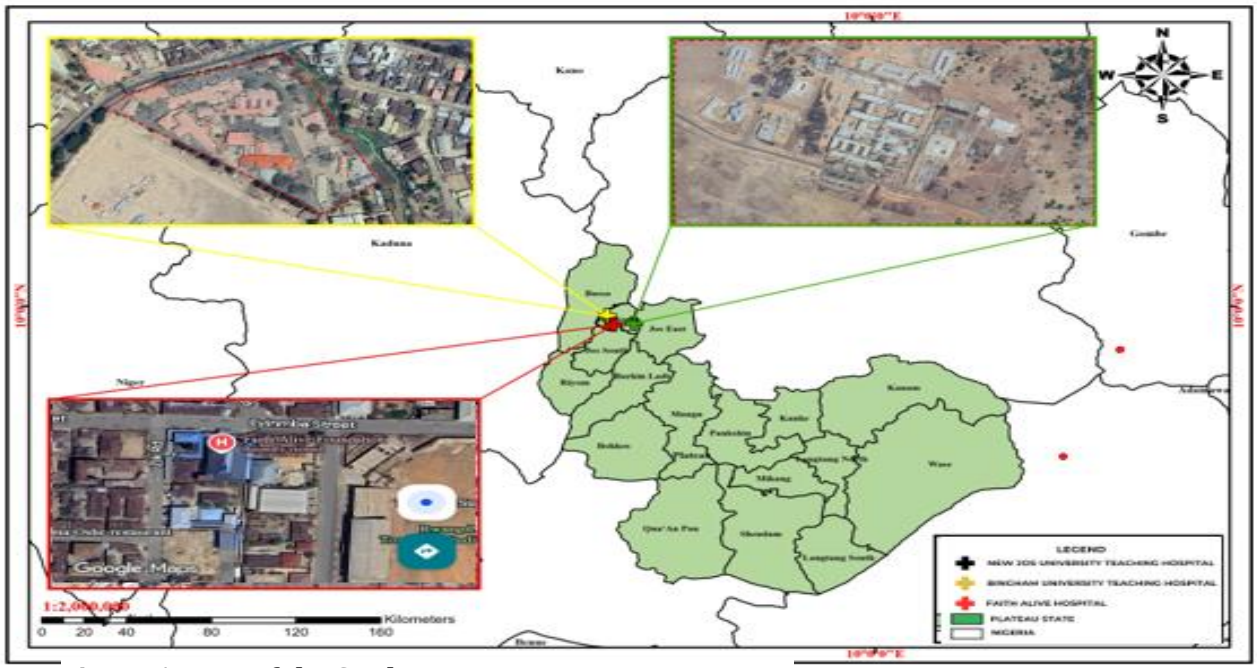

Figure 1: Map of the Study Area

A total of 180 informal caregivers were purposively selected across the three hospitals, with 60 participants recruited from each facility. Purposive sampling was employed to ensure that respondents had relevant care giving experience and could provide rich insights into the cultural and architectural factors affecting their care giving roles. This non-probability sampling technique was chosen because it allows for the selection of participants based on specific characteristics pertinent to the research objectives. Primary data were collected using a structured questionnaire comprising four sections: socio-demographic information, care giving responsibilities, perceptions of hospital architecture and facilities, and cultural and technological considerations affecting care giving. The questionnaire included a combination of closed-ended and Likert-scale items, allowing for quantitative analysis of caregivers' experiences. The instrument was pre-tested among 15 caregivers in a hospital not included in the main study to ensure clarity, reliability, and validity. Cronbach's alpha coefficient for internal consistency was calculated at 0.82, indicating acceptable reliability.

Data collection was conducted over four weeks. Trained research assistants administered questionnaires to caregivers at the bedside or in designated hospital waiting areas, minimising disruption to patient care. Participants were briefed on the purpose of the study and provided informed consent prior to participation. To maintain confidentiality, respondents' identities were anonymised, and completed questionnaires were securely stored for data entry and analysis.

Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) version 28. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarise caregivers' socio-demographic characteristics, caregiving responsibilities, and perceptions of hospital architecture and cultural support. Inferential statistics, such as Chi-square tests and Pearson correlation analyses, were conducted to examine associations between socio-cultural factors, ward infrastructure, and caregiver outcomes. Tables, bar charts, and pie charts were generated to present findings visually, enhancing clarity and interpretability.

Ethical approval for this study was obtained from the Research Ethics Committees of the three hospitals involved: JUTH, BUTH, and Faith Alive Hospital. Participants were assured of voluntary participation, confidentiality, and the right to withdraw from the study at any time without penalty. The research adhered to the principles outlined in the Declaration of Helsinki, ensuring the protection of participants' rights and welfare throughout the study.

4. Results and Discussion

The study involved 180 informal caregivers from three hospitals in Jos: Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH), and Faith Alive Hospital. The respondents' socio-demographic characteristics are summarised in Figure 2.

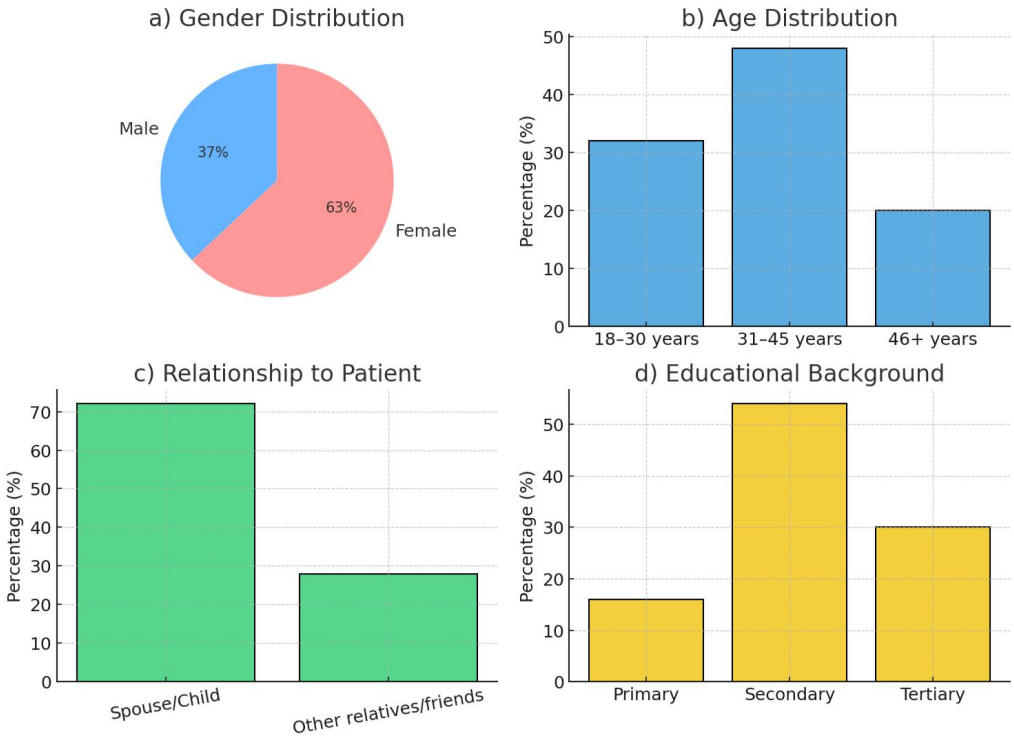

Figure 2: Socio-Demographic Characteristics of Informal Caregivers

The majority of caregivers were female (63%), aged 31-45 (48%), and predominantly spouses or children of patients (72%). Most caregivers had completed secondary education (54%), while 30% had tertiary education. These demographics indicate that care giving is largely undertaken by adult family members who balance responsibilities with personal and professional obligations.

Table 1 presents care givers' use of technology for communication and care coordination. The results show that 65% of caregivers reported using mobile phones for daily communication with hospital staff, while 20% utilised social media platforms such as WhatsApp to coordinate care. Only 10% reported occasional use of hospital-based electronic systems, highlighting a gap in the integration of digital tools in care giving practices. This trend suggests that informal caregivers rely heavily on personal technology, which may not always be compatible with hospital protocols.

Table 1: Care givers' Use of Technology for Communication

Mode of Communication	Frequency (%)
Mobile phones (calls/SMS)	65%
Social media (e.g., WhatsApp)	20%
Hospital electronic systems	10%
None	5%

Figure 3 summarises the challenges faced by caregivers in hospital wards. The most frequently reported challenges were inadequate ward space (78%), insufficient seating (62%), lack of privacy (57%), and limited access to sanitary facilities (48%). Cultural factors, such as gender norms influencing care giving roles, were reported by 42% of participants. These findings suggest that hospital architecture and ward design significantly affect caregivers' ability to provide optimal support while maintaining personal comfort and dignity.

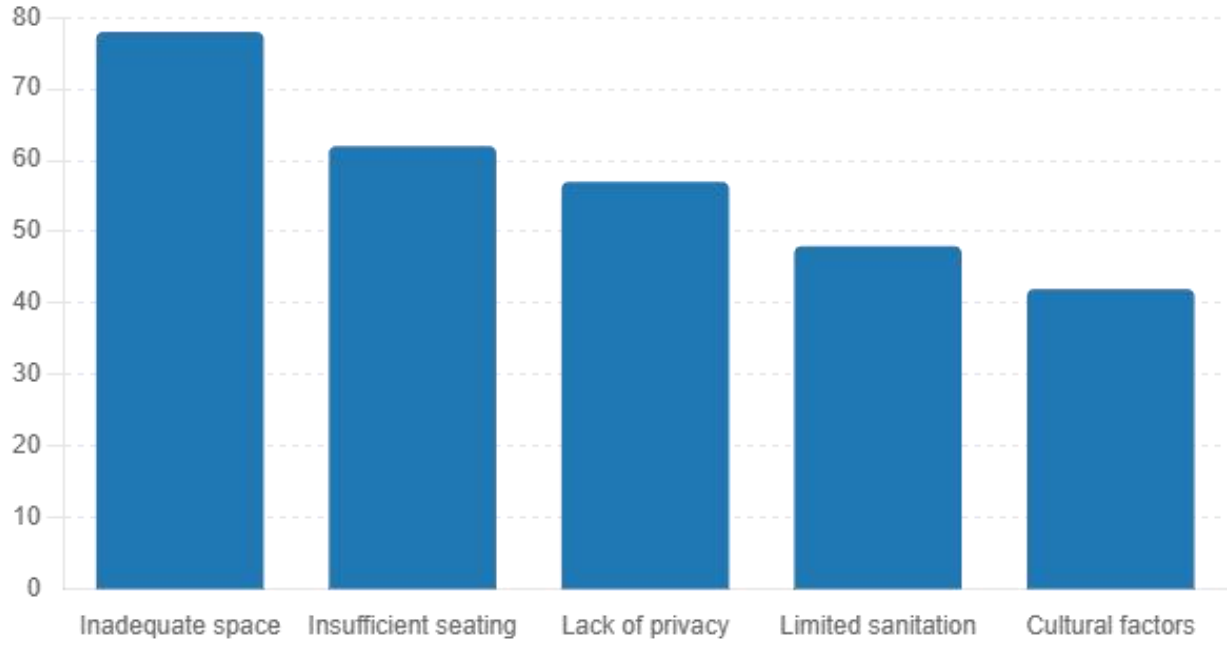

Figure 3: Challenges Faced by Caregivers in Hospital Wards

Figure 4 depicts caregivers' perceptions of hospital facilities and cultural support. Respondents rated the adequacy of ward facilities on a Likert scale from 1 (very poor) to 5 (excellent). The mean scores for space adequacy, privacy, seating, and access to clean sanitation were 2.3, 2.1, 2.5, and 2.8, respectively. Cultural support, including allowances for family involvement in care and respect for local care giving customs, received a mean score of 3.2, suggesting moderate institutional recognition of cultural considerations.

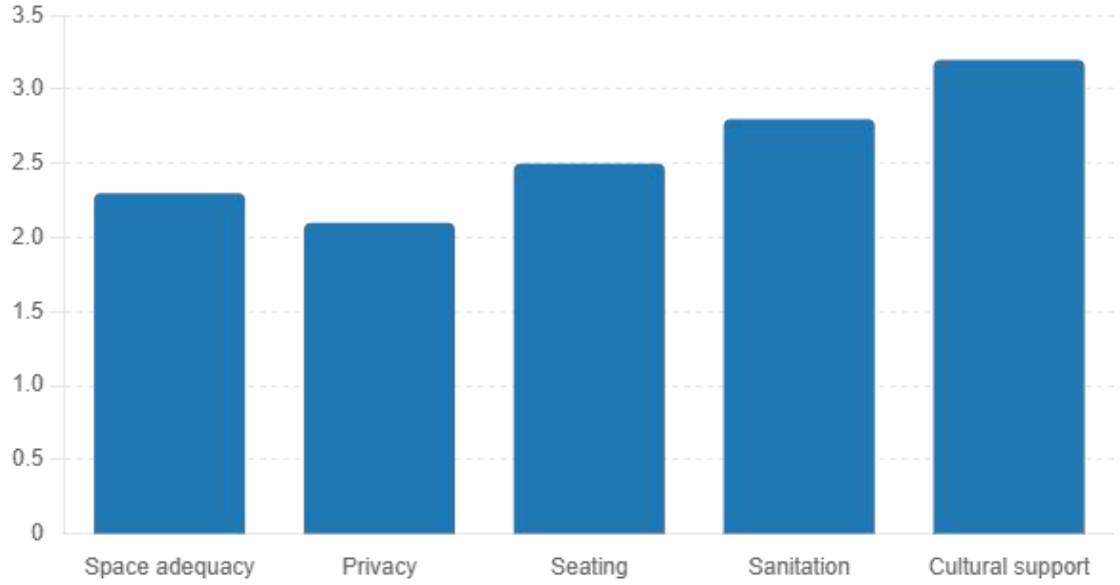

Figure 4: Caregivers' Perceptions of Hospital Facilities and Cultural Support

Table 2 highlights caregivers' suggestions for improving hospital support. The most commonly recommended interventions were increasing ward space (70%), providing comfortable seating (65%), ensuring access to restrooms and sanitation facilities (58%), and integrating communication technology with medical staff (50%). These recommendations underscore the importance of aligning hospital infrastructure and services with the practical and cultural needs of informal caregivers.

Table 2: Caregivers' Suggestions for Improving Hospital Support

Suggested Intervention	Frequency (%)
Increase ward space	70%
Provide comfortable seating	65%
Improve sanitation/restrooms	58%
Integrate technology for communication	50%

A correlation analysis (Table 3) was conducted to examine the relationship between ward infrastructure adequacy and caregiver satisfaction. Results indicate a significant positive correlation ($r = 0.67$, $p < 0.01$), suggesting that improvements in physical space, privacy, and amenities are

associated with higher caregiver satisfaction. Similarly, the integration of culturally sensitive practices was associated with a moderate positive correlation with caregivers' perceptions of support ($r = 0.54$, $p < 0.05$).

Table 3: Correlation Analysis of Ward Infrastructure and Caregiver Satisfaction

Variable	Correlation (r)	Significance (p-value)
Ward infrastructure adequacy ↔ Caregiver satisfaction	$r = 0.67$	$p < 0.01$
Cultural support ↔ Caregiver perception of support	$r = 0.54$	$p < 0.05$

Overall, the results demonstrate that informal caregivers play a critical role in patient care within Nigerian hospital wards. However, their effectiveness is constrained by architectural limitations, inadequate facilities, and limited cultural accommodations. Enhancing ward design, infrastructure, and institutional support for cultural practices can significantly improve caregivers' experiences and patient outcomes. The findings of this study indicate that informal caregivers in Nigerian hospital wards face multifaceted challenges, encompassing infrastructural, cultural, and technological dimensions. The predominance of female caregivers aged 31–45 years aligns with global and local trends where caregiving responsibilities are largely borne by adult women within family structures (Eze et al., 2021; Abimbola et al., 2022). This demographic distribution highlights the dual pressures faced by caregivers, who often manage household and employment responsibilities alongside patient care, underscoring the need for hospital systems to accommodate this demographic reality in their ward designs.

The study reveals that caregivers predominantly rely on mobile phones and social media platforms to communicate and coordinate care. This reliance reflects gaps in formal hospital communication systems and aligns with prior research emphasising the role of personal technology in bridging institutional inefficiencies (Okafor & Ojo, 2020; Adebayo et al., 2021). Limited use of hospital-based electronic systems suggests that digital infrastructure within wards is underdeveloped, presenting an opportunity for hospitals to implement integrated communication platforms to streamline caregiver-patient-staff interactions, thus reducing stress and enhancing care quality.

Infrastructural challenges, such as inadequate ward space, limited seating, lack of privacy, and insufficient access to sanitary facilities, emerged as the most pressing concerns for caregivers. These findings mirror previous studies demonstrating that hospital design in many Nigerian institutions prioritises patient capacity over the comfort and support of family caregivers (Ibrahim & Bello, 2019; Olatunji et al., 2020). The correlation between ward infrastructure adequacy and caregiver satisfaction underscores the importance of considering informal caregivers in the planning and renovation of hospital wards. Addressing these physical limitations can reduce caregiver fatigue, enhance patient support, and improve overall health outcomes.

Cultural considerations also play a significant role in shaping care giving experiences. Respondents reported challenges related to gender expectations, familial roles, and cultural norms influencing their capacity to provide care. The moderate scores for cultural support indicate that hospitals recognise the importance of family involvement but have not fully institutionalised culturally sensitive practices. This aligns with Bujo's (2019) conceptualisation of communal ethics, which emphasises communities' moral responsibility to support care giving within culturally appropriate

frameworks. Integrating cultural considerations in hospital policies, such as flexible visiting hours, gender-sensitive ward layouts, and spaces for family engagement, can significantly enhance caregivers' well-being and patient care.

Caregivers' suggestions for improvement, such as expanding ward space, increasing seating, providing better sanitation, and integrating communication technology, provide actionable insights for hospital administrators. These recommendations resonate with global best practices that advocate for caregiver-inclusive hospital design, emphasising ergonomics, privacy, and technological facilitation (WHO, 2018; Hwang et al., 2020). The positive correlation between improved infrastructure and caregiver satisfaction underscores that investments in hospital design are not merely aesthetic but have practical implications for healthcare delivery and familial support systems.

In conclusion, this study demonstrates that Nigerian hospital wards must evolve to recognise the essential role of informal caregivers. Enhancing architectural design, improving technological support, and incorporating culturally sensitive practices can significantly mitigate challenges faced by caregivers, thereby promoting more effective, holistic patient care. These findings provide a foundation for policymakers and hospital administrators to implement interventions that balance clinical efficiency with caregiver well-being, ultimately fostering a healthcare environment that respects both patients and those who support them.

5. Conclusion

This study highlights the critical role of informal caregivers in Nigerian hospital wards and the significant challenges they face due to infrastructural, technological, and cultural factors. Findings reveal that caregivers, predominantly women aged 31–45, navigate complex responsibilities while providing essential support to patients, often under physically and emotionally taxing conditions. Inadequate ward space, limited seating, lack of privacy, and insufficient access to sanitary facilities emerged as key barriers. At the same time, the reliance on personal mobile devices for communication underscores gaps in hospital technological infrastructure. Cultural norms and gendered expectations further influence care giving experiences, suggesting that hospital policies must account for both communal ethics and family-centred care practices.

The study underscores the importance of caregiver-inclusive hospital design, integrating spatial, technological, and culturally sensitive considerations to enhance the well-being of both patients and their informal caregivers. By implementing targeted improvements, such as expanded ward layouts, accessible sanitation, ergonomic seating, and digital communication tools, hospitals can significantly alleviate caregiver burden and enhance patient care. These findings provide actionable insights for hospital administrators, architects, and policymakers, emphasising that healthcare delivery in Nigeria must move beyond patient-centric models to embrace the broader ecosystem of support, recognising informal caregivers as indispensable partners in achieving quality healthcare outcomes.

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