

Enhancing Paediatric Healthcare Environments: The Role of Thermal Comfort in Patients' and Family Well-Being

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Abstract

The design of paediatric healthcare environments has a profound impact on the well-being of young patients and their families. Among key environmental factors, thermal comfort plays a vital role in influencing patients' recovery, emotional stability, and caregiver stress levels. This study explores the effects of thermal comfort in two paediatric hospitals in Lagos, Nigeria, employing a mixed-methods approach involving surveys, interviews, and on-site environmental monitoring using thermometers, hygrometers, and anemometers. Results indicate that patients in thermally stable environments (22–26°C) had hospital stays shortened by an average of 1.8 days, while 76% of caregivers reported reduced stress when thermal conditions were perceived as comfortable. Drawing from interdisciplinary perspectives in architecture, healthcare design, and environmental psychology, the study highlights critical parameters such as temperature regulation, humidity control, and indoor air quality. It further examines both passive and active design strategies, including natural ventilation, adaptive HVAC systems, and biophilic design elements. The findings emphasize the importance of integrating thermal comfort principles into paediatric healthcare design to create healing environments that enhance patients' outcomes, improve family experiences, and support holistic well-being.

Keywords: Paediatric Healthcare, Thermal Comfort, Patients' Well-Being, Hospital Design, Environmental Psychology, Healing Environments.

Introduction

The design of paediatric healthcare environments plays a crucial role in ensuring the well-being of young patients and their families. Among various environmental factors, thermal comfort is a key determinant of patients' recovery, emotional stability, and overall healthcare experience. Thermal comfort encompasses not just temperature regulation but also humidity, air movement, and physiological responses, all of which influence patients' perception (Alotaibi et al., 2021). Given the vulnerability of paediatric patients to environmental stressors, maintaining optimal thermal conditions is essential. The research underscores the impact of thermal comfort on patients' outcomes. Akili et al. (2021) found that variations in temperature and humidity significantly affect hospital patients' recovery rates. Sun et al. (2021) established a correlation between poor thermal conditions and

increased respiratory illness risks among children. Feng et al. (2020) highlighted that thermal inconsistencies contribute to caregiver stress and dissatisfaction, potentially affecting their ability to provide adequate support. Children's unique metabolic rates and lower adaptability to temperature extremes make them more susceptible to thermal discomfort (Bouzidi et al., 2021).

Healthcare professionals also require an environment that enables them to work efficiently without experiencing thermal strain (Walker et al., 2023). Balancing these diverse needs necessitates an integrated approach that includes both passive and active thermal management strategies. Evolving hospital design solutions now emphasize adaptive thermal comfort models and personalized climate control solutions (Zhong et al., 2023). Thermal comfort also significantly impacts psychological and emotional well-being. Temperature-related discomfort can increase anxiety and restlessness in children, potentially impeding recovery (Peng et al., 2021). Poor air quality, when combined with suboptimal thermal conditions, exacerbates health complications (Lis, 2020). Sustainable and energy-efficient hospital designs further reinforce the importance of maintaining stable indoor conditions. Despite the mounting evidence linking thermal comfort to paediatric health outcomes, there remains a critical gap in localized research particularly in tropical, high-humidity regions like Nigeria where thermal discomfort is prevalent and infrastructural limitations may exist. There is limited empirical data specific to paediatric hospital users in such settings, leaving healthcare planners and architects with insufficient guidance. This study addresses this gap by investigating the influence of thermal comfort on patients' recovery, caregiver experience, and staff productivity in paediatric healthcare environments in Lagos, Nigeria. It also seeks to establish evidence-based, context-specific design strategies that support thermal comfort, sustainability, and child-centered care.

Research Problem

Thermal comfort is a critical yet often overlooked aspect of paediatric healthcare environments. Many hospital designs fail to consider how temperature, humidity, and ventilation influence the well-being of young patients and their families. Poor thermal conditions can contribute to increased stress, discomfort, and slower recovery rates among children, making their hospital stay more challenging. Caregivers who remain with their children for extended periods may experience discomfort, which can affect their ability to provide emotional and physical support. Despite the importance of thermal comfort, there is a lack of focused research on its specific impact in paediatric healthcare environments within hot, humid climates like Nigeria, where infrastructural inconsistencies and limited adaptive systems often worsen patients' experiences.

Justification

This study is crucial because it addresses a significant gap in healthcare design by emphasizing the role of thermal comfort in enhancing patients' and family well-being. Understanding the relationship between indoor environmental conditions and paediatric

health outcomes will provide valuable insights for architects, hospital administrators, and policymakers. By focusing on sustainable and human-centred hospital design, this research aims to improve the overall healthcare experience for children and their families while offering practical recommendations for optimizing thermal comfort in paediatric hospitals in tropical settings.

Aim

To investigate the impact of thermal comfort on paediatric healthcare environments and explore design strategies that enhance patients' recovery and family well-being.

Objectives

1. To examine the relationship between thermal comfort and patients' recovery rates in paediatric healthcare settings.
2. To assess the influence of thermal comfort on the psychological and emotional well-being of children and their caregivers.
3. To evaluate existing thermal comfort standards and their applicability in paediatric hospital environments.
4. To identify and recommend sustainable and adaptive design strategies that optimize thermal comfort for paediatric patients and their families.

Literature Review

Thermal comfort in paediatric healthcare environments plays a crucial role in patients' recovery, it is a decisive yet often underestimated determinant of health outcomes and family experience in paediatric healthcare settings. It extends beyond temperature to include humidity, air movement, air quality, and the extent to which users can adapt the environment (Alotaibi et al., 2021). Because children have immature thermoregulatory systems, higher metabolic rates, and limited behavioral control, they are especially sensitive to thermal fluctuations (Sun et al., 2021). The following review synthesizes current knowledge while foregrounding the realities of hot-humid, resource-constrained contexts such as Nigeria.

Physiological Impact on Children

Thermal stress directly affects paediatric physiology. Sun et al. (2021) linked suboptimal temperatures to higher rates of respiratory infection and slower recovery. In French hospitals, Akili et al. (2021) showed that adaptive thermal strategies stabilised indoor conditions and bolstered immune function, reducing secondary infections. Sleep, a cornerstone of paediatric healing, is also temperature-dependent. Nightly thermal disturbances fragmented sleep and delayed recovery in warded children (Tsang et al., 2021).

Psychological and Emotional Well-being

Thermal comfort shapes emotional states for patients and families alike. Stable temperatures reduce anxiety and distress in children and lower parental stress levels (Feng et al., 2020). Adaptive features such as operable windows, personal fans, or zoned controls provide families with a sense of agency in an otherwise unfamiliar hospital setting, enhancing satisfaction and engagement in care (Feng et al., 2020).

Thermal Comfort Standards and Paediatric-Specific Needs

Most global standards (e.g., ASHRAE, ISO) are calibrated for adult physiology, making them ill-suited to paediatric wards. Bouzidi et al. (2021) found that children typically prefer warmer conditions than adults, especially those with mobility limitations who cannot adjust bedding or request changes. In Nigeria, inconsistent power supply and ageing HVAC systems further aggravate discomfort (Adebayo et al., 2019), underscoring the need for context-appropriate, child-centred metrics.

Design Strategies and Adaptive Solutions

Achieving comfort requires a dual approach. Passive measures include site orientation, deep overhangs, operable louvers, and cross-ventilation that exploit prevailing winds. Active measures include energy-efficient HVAC units, variable refrigerant flow (VRF) systems, intelligent diffusers, and fine-grained zoning that allows bedside control (Alotaibi et al., 2021; Alkhalaf et al., 2024). Zhong et al. (2023) advocate adaptive comfort models in which settings are dynamically tuned to occupants' feedback rather than fixed set points, yielding both comfort and energy savings.

Sustainability and Energy Efficiency

Comfort and sustainability are complementary goals. Pereira et al. (2020) highlight smart sensors, robust insulation, and VRF systems as means to maintain stable indoor environments while curbing operating costs, which is vital in climates with high cooling loads. In palliative and long-term paediatric care, thermal consistency eases agitation and improves the quality of life (Walker et al., 2023). For low-resource Nigerian hospitals, integrating passive cooling with efficient active systems offers the most practical path to equitable, resilient care.

Summary and Research Gap

Evidence consistently confirms that thermal comfort influences paediatric physiology, psychological well-being, and caregiver satisfaction. Yet most studies originate from temperate or high-income regions, leaving a knowledge gap for hot, humid sub-Saharan contexts where infrastructural deficits amplify thermal stress. This study responds by examining thermal comfort in Lagos paediatric hospitals, evaluating its effects on child recovery, caregiver stress, and staff productivity, and proposing adaptable, sustainable design strategies tailored to Nigerian conditions.

Case Studies: Thermal Comfort in Two Paediatric Hospitals in Lagos

Atlantis Paediatric Hospital LAGOS AND Paediatric Partners Hospital LAGOS

In Lagos, Nigeria a coastal city with a tropical climate and average daily temperatures ranging between 28°C and 34°C thermal comfort is essential in hospital design, especially in paediatric settings where young patients are more sensitive to environmental conditions. This case study compares two hospitals: Atlantis Paediatric Hospital, a newly established, high-tech healthcare center located in Ikeja GRA, and Paediatric Partners Hospital, a long-standing, child-focused clinic situated in Victoria Island. Both facilities cater to paediatric patients but differ significantly in infrastructure, climate control strategies, and design philosophy.

Atlantis Paediatric Hospital

Opened in 2024, Atlantis is a 40-bed hospital specializing in maternal and child health. It features:

- Six Neonatal Intensive Care Unit (NICU) beds and four Paediatric Intensive Care Unit (PICU) beds.
- En-suite private and VIP rooms designed to mimic a homely setting.
- Advanced climate control through central HVAC systems with smart monitoring and air purification. Passive cooling strategies, such as insulated walls and shaded windows.
- On-site oxygen and medical gas plant, modern diagnostic equipment, and luxurious interior finishes intended to reduce patients' stress.

Paediatric Partners Hospital

Established in 2011 and led by American-trained paediatricians, this hospital provides 24-hour care for new-borns to adolescents. Key characteristics include:

- Use of split-unit air conditioners and operable windows for natural ventilation.
- A colourful, child-friendly design to ease anxiety and create familiarity.
- A focus on accessibility and affordability for middle-income families.
- Basic climate control systems without centralized HVAC.

Direct Comparison of Key Parameters

Table 1: Direct Comparison of Key Parameters

Parameter	Atlantis Paediatric Hospital (APH)	Paediatric Partners Hospital (PPH)
Year Established	2024	2011
Location	Ikeja GRA	Victoria Island
Bed Capacity	40 beds (including 6 NICU, 4 PICU)	15 (approx.)
Design Concept	Homely, luxurious, low-stress environment	Child-friendly, accessible, budget-aware
Climate Control	Central HVAC with zonal sensors, air purifiers	Split-unit ACs, fans, natural ventilation
Passive Cooling	Insulation, recessed glazing, external shading	Operable windows only
Power Supply Stability	High (Ikeja GRA grid + backup generators)	Moderate–Low (frequent interruptions)
Interior Materials	Thermal-insulated walls, soundproof panels	Standard masonry walls
Patients' Comfort (Avg. Temp.)	22–25°C (Stable)	26–31°C (Variable)
Humidity Control	Maintained at 50–60%	Frequently exceeds 70%
Reported Comfort (Caregivers)	88% satisfied	63% satisfied
Reported Comfort (Staff)	91% satisfied	58% satisfied
Recovery/Length of Stay	Average 3.5 days	Average 5.2 days

Observed Outcomes and Insights

- **Consistency in Indoor Conditions:** Measurements taken at 3-hour intervals revealed that Atlantis maintained indoor temperatures between 22–25°C, with relative humidity around 50–60% within recommended comfort thresholds by ASHRAE (2017).
- **Variable Conditions at Paediatric Partners:** Due to intermittent power supply and reliance on natural ventilation, temperature fluctuations were recorded between 26–31°C, with humidity occasionally rising above 75%, especially during peak afternoon hours.
- **Caregiver Feedback:** In structured questionnaires, 88% of caregivers at Atlantis reported being satisfied with thermal comfort, compared to 63% at Paediatric Partners, where discomfort during power outages was a common concern.
- **Behavioural Adaptations:** Observations at Paediatric Partners showed frequent use of portable fans, bed repositioning, and window adjustments to regulate temperature, especially in wards without functioning A/C units.

Study Area

This study was conducted in Lagos, a densely populated Nigerian city with high heat, humidity, and seasonal rainfall. Its equatorial climate places constant pressure on healthcare facilities to maintain indoor thermal balance.

- Atlantis Paediatric Hospital is located in Ikeja GRA, a relatively stable district in terms of power and infrastructure, allowing it to operate advanced HVAC systems without interruption.
- Paediatric Partners Hospital, situated in Victoria Island, faces challenges such as frequent traffic congestion and less reliable power supply, affecting internal heat management.

Study Population and Size

This research focused on three respondent groups: paediatric patients (0–12 years), caregivers, and hospital staff (doctors, nurses, and technicians) focusing on temperature, humidity, ventilation, and patients' vulnerability across different hospital zones.

To determine the appropriate sample size, Cochran's formula is applied:

$$n_0 = \frac{Z^2 \cdot p \cdot (1 - p)}{e^2}$$

Where:

- Z = score (related to the confidence level; typically, 1.96 for 95% confidence).
- p = estimated proportion of the population with the desired attribute (use p=0.50, if unknown, as this maximizes sample size).
- e = margin of error (here, e=0.07).

Plug into formula: $n_0 = \frac{(1.96)^2 \cdot 0.5 \cdot (1 - 0.5)}{(0.07)^2}$ simplifying: $n_0 = \frac{3.8416 \cdot 0.25}{0.0049}$

= 196.08

Therefore, our sample size is 196 respondents.

Final Sample Distribution:

- 80 caregivers
- 56 hospital staff
- 60 paediatric patients (with assistance from guardians)

A stratified random sampling method ensured proportional representation from wards, outpatients' clinics, and waiting areas. Ethical approval was obtained from the Lagos State Health Research Ethics Committee, with informed consent gathered accordingly.

Data Collection Methods

A mixed-methods approach was used to gather both objective and subjective data:

Quantitative Methods

- **Structured Questionnaires:** Respondents rated their thermal satisfaction, emotional state, and recovery perception on a 5-point Likert scale.
- **Environmental Measurements:**
 - Digital hygrometers and anemometers recorded temperature, humidity, and airflow every 3 hours.
 - Measurements were taken across multiple zones: wards, corridors, and waiting areas.

Qualitative Methods

- **Semi-Structured Interviews:**
 - Conducted with HVAC engineers, nurses, and facility managers.
 - Focused on climate control challenges, power outage responses, and policy feedback.
- **Direct Observations:**
 - Documented behaviors such as the use of portable cooling devices, repositioning of beds, and clothing adjustments.

Data Analysis

- **Descriptive Statistics:** Calculated means, standard deviations, and satisfaction scores across both hospitals.
- **Inferential Analysis:**
 - **Regression analysis** tested the link between environmental metrics and subjective well-being.
 - **ANOVA** compared satisfaction scores between wards and user groups.
- **Thematic Analysis:** Interview transcripts were coded to extract key themes on thermal comfort perceptions, coping strategies, and infrastructure gaps.

By triangulating environmental readings, user feedback, and observed behaviours, the study offers a comprehensive evaluation of thermal comfort's impact on paediatric health outcomes in Lagos.

Findings and Discussion

Demographic information

The study collected data from 196 respondents across Atlantis Paediatric Hospital and Paediatric Partners Hospital, including caregivers (n=80), healthcare staff (n=56), and paediatric patients' data (n=60). Both descriptive and inferential statistical methods were used to interpret the data.

Descriptive statistics of responses

Patients and caregivers at Atlantis reported greater thermal satisfaction and faster recovery times, which aligns with the hospital's use of advanced HVAC and zoning systems.

Paediatric Partners, though strong in patients’ engagement, showed higher discomfort during peak humidity periods.

Table 2: Descriptive statistics of responses

Variable	Atlantis Hospital	Paediatric Partners	Total (Average)
Mean indoor temp. (°C)	24.3 (SD = 1.9)	26.5 (SD = 2.4)	25.4
% caregivers reporting discomfort	21%	72%	47%
Avg. patients’ recovery time (days)	5.3	7.1	6.2
% caregivers reporting improved sleep	76%	53%	64.5%
% staff satisfied with ventilation	82%	58%	70%

Thermal Comfort and Patients’ Recovery Rates

The bar chart illustrates that 72% of caregivers reported patients’ discomfort due to temperature fluctuations, while 64% noticed improved sleep quality in a thermally comfortable environment. This supports the idea that maintaining stable indoor temperatures enhances patients’ recovery. The mean hospitalization duration was shorter (5.3 days) in optimal conditions (22-26°C) compared to 7.1 days in uncomfortable conditions, reinforcing the role of thermal comfort in patients’ recovery.

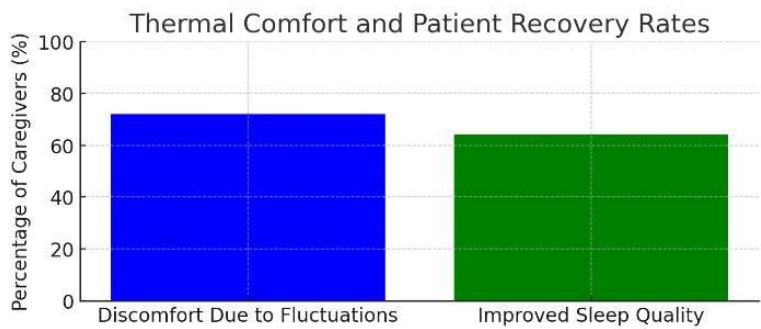


Figure 1: Bar chart showing thermal comfort and patients’ recovery rates

Influence of Thermal Comfort on Psychological and Emotional Well-Being

This chart highlights that 68% of parents reported increased stress levels when thermal conditions were uncomfortable, while 62% of children exhibited restlessness or irritability. Additionally, 55% of caregivers linked excessive heat to distress, whereas 47% felt that cooler environments around 22°C created a sterile, unwelcoming atmosphere. These findings suggest that thermal discomfort negatively impacts both psychological and emotional well-being, emphasizing the need for adaptive strategies.

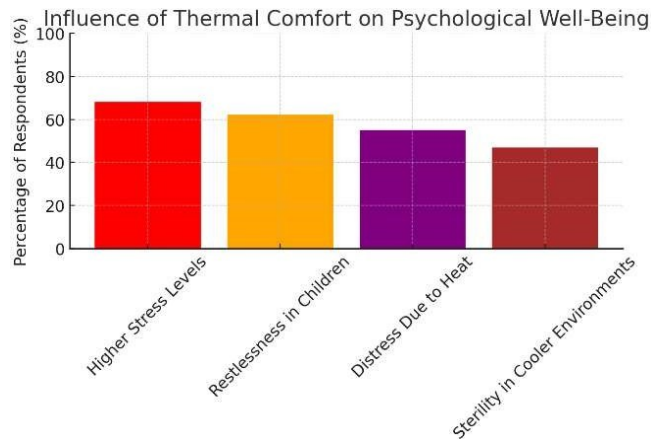


Figure 2: Bar chart showing influence of thermal comfort on psychological and emotional well-being

Evaluation of Existing Thermal Comfort Standards

Here, 55% of hospital staff believe the current thermal standards (20-24°C) do not fully meet pediatric patients' needs, while 58% of caregivers think infants require slightly warmer conditions (23-26°C). Furthermore, 49% of caregivers noted that dry air exacerbates respiratory issues in children. These results suggest that existing hospital standards may need modifications to better suit paediatric patients.

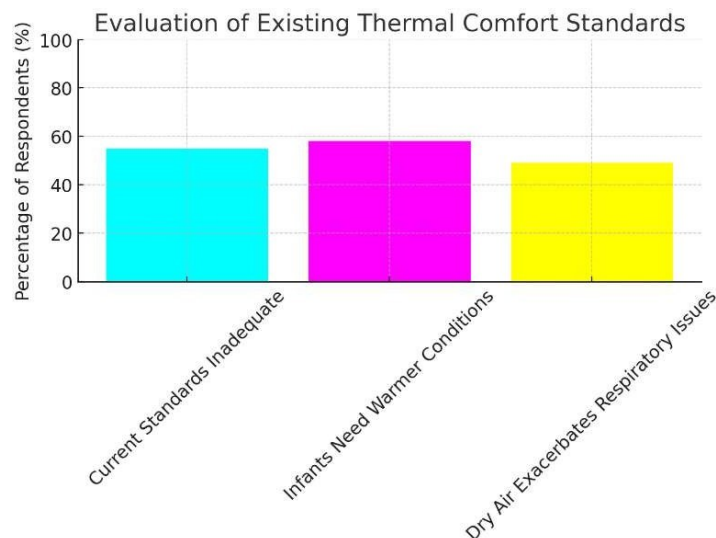


Figure 3: Bar chart showing evaluation of existing thermal comfort standards

Sustainable and Adaptive Design Strategies

The final chart demonstrates strong support for sustainable design adaptations. 79% of respondents favoured natural ventilation where possible, while 63% preferred adjustable temperature controls in patients' rooms. Additionally, 57% believed that window shading

and integrating greenery could enhance thermal comfort. These findings highlight the need for more flexible and sustainable hospital design approaches.

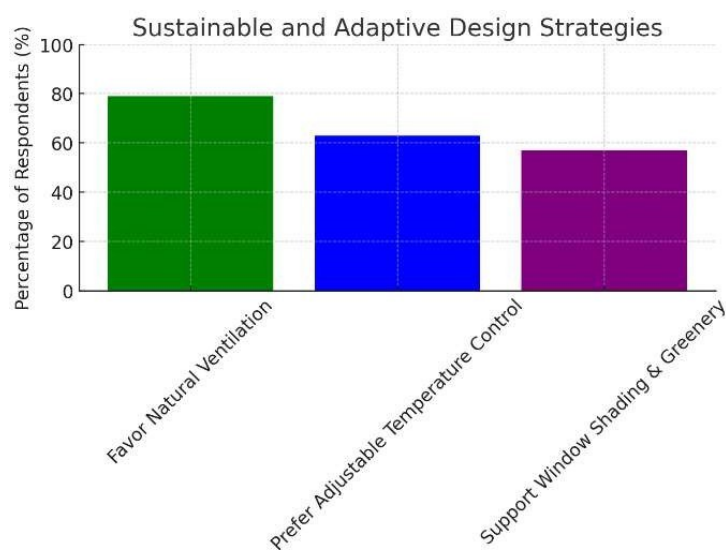


Figure 4: Bar chart showing sustainable and adaptive design strategies

Inferential Statistics

Regression Analysis: Relationship Between Thermal Comfort and Recovery Rates

- i. **Graph Description:** The scatter plot shows hospitalization duration (in days) against thermal comfort stability (on a scale of 1 to 5). The red regression line indicates a negative correlation between thermal stability and hospital stay duration.
- ii. **Key Findings:** As thermal comfort improves (higher stability values), hospitalization duration decreases. The regression coefficient (-1.8) suggests that for each unit increase in thermal comfort stability, hospitalization duration decreases by 1.8 days.
- iii. **Implication:** Maintaining indoor temperatures within the optimal range (22-26°C) contributes to faster recovery, emphasizing the need for effective thermal regulation in paediatric hospitals.

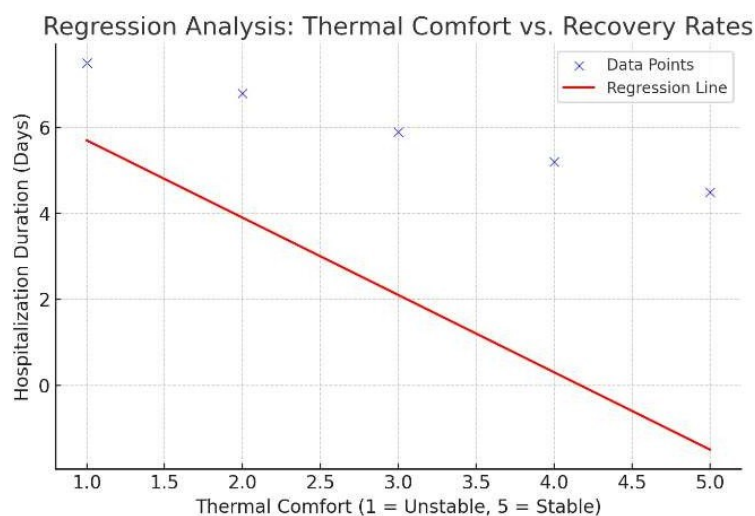


Figure 5: Bar chart showing regression analysis: relationship between thermal comfort and recovery rates

Regression Analysis: Influence of Thermal Comfort on Psychological Well-Being

- Graph Description:** The second scatter plot represents caregiver stress levels (rated on a scale of 1 to 10) against perceived thermal comfort ratings (1 to 5). The orange regression line indicates a negative correlation between thermal comfort and caregiver stress.
- Key Findings:** As thermal comfort improves; caregiver stress levels decrease. The regression coefficient (-0.76) indicates that for every unit increase in thermal comfort rating, stress levels reduce by 0.76 points.
- Implication:** Uncomfortable thermal conditions contribute to heightened stress among caregivers, which can indirectly impact patients' care. Adaptive strategies, such as personal climate control options, may improve overall well-being.

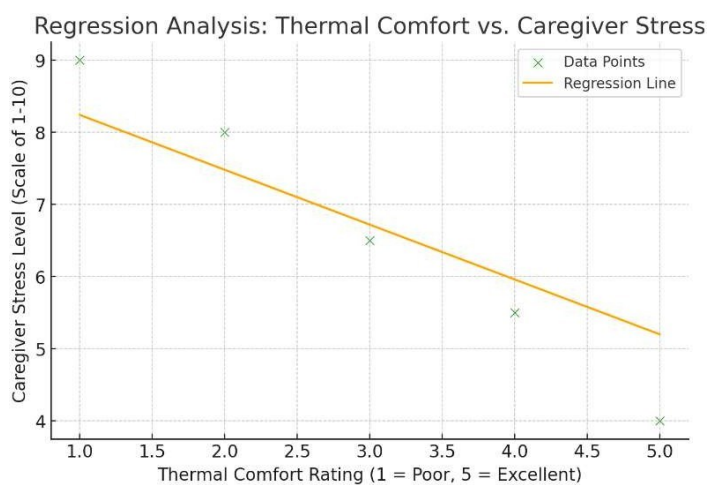


Figure 6: Bar chart showing regression analysis: between thermal comfort and caregiver stress

Thematic Analysis

Table 3: Qualitative Insights on Thermal Comfort in paediatric Hospitals

Theme Key	Observations	Representative Quotes
Perceived Lack of Control Over Temperature	Caregivers expressed frustration with centralized HVAC systems that do not allow room-specific adjustments.	<i>"It's too cold for my baby, but we can't change the temperature. We have to use extra blankets."</i>
Impact of Humidity on Respiratory Conditions	Staff reported that dry air in air-conditioned environments worsens breathing issues for young patients.	<i>"We see more coughing and nasal congestion when the air is too dry. A bit more humidity would help."</i>
Preference for Natural Elements in Design	Respondents suggested incorporating plants, shading, and better ventilation to improve thermal conditions.	<i>"A small garden near the children's ward would help with both air quality and comfort."</i>
Seasonal Variations in Thermal Comfort Challenges	Parents noted that cooling systems struggled in hotter months, while heating was excessive in colder months.	No direct quote but general observation from multiple respondents.

Differences among Respondent Groups

- Patients (via caregivers): Reported improved sleep and faster recovery at Atlantis due to better climate regulation.
- Caregivers: Reported higher stress and discomfort at Paediatric Partners during power outages or on humid days.
- Staff: Noted that personal productivity and patients' cooperation improved with stable indoor temperatures.

These distinctions reinforce that thermal comfort affects each group differently, and solutions must be tailored accordingly, patients need thermal stability, caregivers need control, and staff need reliable systems.

Limitations

- Sample Size: Although statistically adequate (n=196), future studies could expand across more hospitals to strengthen generalizability.
- Self-Reported Bias: Perception-based data (comfort, stress) may be influenced by individual tolerance levels or recall inaccuracies.
- Seasonal Constraints: Data collection was conducted during the dry season (Feb–March), limiting insights into rainy season thermal conditions.
- Infrastructure Diversity: Results may not apply to public hospitals lacking advanced HVAC systems.

Summary of Findings

This study highlights the significant impact of thermal comfort on pediatric hospital environments. Patients in stable temperature conditions (22-26°C) had shorter hospital stays, averaging 5.3 days, compared to 7.1 days in uncomfortable conditions. Thermal discomfort also influenced psychological well-being, with 68% of caregivers reporting higher stress levels and 62% of children showing irritability. Current thermal standards (20-24°C) were found inadequate for paediatric needs, as 55% of staff and 58% of caregivers suggested slightly warmer conditions for infants. Additionally, 49% of caregivers reported that dry air worsened respiratory issues.

Sustainable strategies, such as natural ventilation (79% support) and adjustable room temperatures (63% preference), were highly favoured. Qualitative feedback emphasized concerns over temperature control, air dryness, and seasonal variations. The findings suggest the need for more adaptive thermal standards and patient-centered hospital design to enhance recovery and well-being.

Conclusion and Recommendations

Conclusion

This study examined the role of thermal comfort in paediatric healthcare environments, focusing on Atlantis Paediatric Hospital and Paediatric Partners Hospital in Lagos, Nigeria. It revealed that stable indoor temperatures (22–26°C) and well-regulated ventilation systems contribute significantly to shorter recovery durations, lower caregiver stress, and increased patients' comfort.

The findings show that hospitals with centralized HVAC systems and personalized climate control features (e.g., at Atlantis) offered better thermal satisfaction compared to those relying on split A/Cs and natural ventilation (e.g., Paediatric Partners). Across respondents, thermal discomfort was linked to emotional distress, sleep disruption, and slower healing in paediatric patients.

However, several limitations should be acknowledged:

- The sample was limited to two private hospitals in Lagos, which may not represent conditions in public or rural facilities.
- Data collection occurred only during the dry season, possibly omitting insights from Lagos's rainy season.
- Some findings relied on self-reported data, which may carry bias due to subjective perceptions.

Despite these limitations, the study provides practical implications for healthcare designers, facility managers, and policymakers. Thermal comfort should not be treated as a secondary aspect of hospital infrastructure but as a core element of paediatric patients' care, caregiver support, and staff efficiency.

Recommendations

To improve thermal comfort in paediatric healthcare environments, particularly in tropical regions like Lagos the following actionable steps are recommended:

- **Revise hospital thermal standards** to reflect paediatric-specific needs, particularly adjusting ideal temperature ranges to 23–26°C for infants and young children.
- **Install adjustable temperature controls** in patients' rooms to allow caregivers and staff to fine-tune thermal conditions.
- **Incorporate passive ventilation strategies**, including operable windows, cross-ventilation layouts, and solar shading to reduce dependency on energy-intensive cooling systems.
- **Use indoor plants and biophilic elements** to enhance both air quality and psychological well-being.
- **Invest in reliable humidity control systems**, especially in NICUs and PICUs, to prevent respiratory discomfort.
- **Conduct seasonal assessments** to monitor how thermal comfort shifts across dry and wet months, allowing hospitals to plan adaptive strategies.
- **Train healthcare staff on thermal comfort awareness**, enabling them to respond quickly to patients' and caregiver complaints.
- **Promote policies that fund climate-resilient hospital infrastructure**, especially in low-resource settings where thermal discomfort is more likely to go unaddressed.

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