



Assessing the Use of Interior Finishing Materials in Residential Architecture and Their Effect on User Comfort in Urban Nigeria

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ABSTRACT

Original Research Article

Interior finishing materials play an important role in shaping the comfort, environmental quality, and user experience of residential buildings. This study assesses the use of interior finishing materials in residential architecture and their effects on user comfort in urban Nigeria. A systematic literature review and thematic synthesis were employed to examine evidence on commonly used finishing materials, factors influencing their selection, their effects on thermal, visual, acoustic, indoor air quality, and psychological comfort, and the sustainability challenges associated with their use. The review indicates a strong preference for conventional materials, particularly ceramic tiles, painted and cement-plastered walls, and plaster-of-Paris ceilings. Material selection is influenced mainly by cost, availability, durability, aesthetics, and socio-cultural preferences. The findings further indicate that finishing materials can influence thermal conditions, visual perception, acoustic performance, and indoor air quality, while their aesthetic and social meanings also shape user satisfaction. Locally sourced and sustainable alternatives show potential but remain constrained by cost, availability, technical limitations, market acceptance, and regulatory challenges. The study recommends performance-based material selection that integrates comfort, sustainability, lifecycle considerations, and user preferences in urban Nigerian residential design.

Keywords: Interior Finishing Materials, User Comfort, Residential Architecture, Indoor Environmental Quality, Urban Nigeria.

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Introduction

Urban homes are no longer judged only by their structural quality or external appearance, but increasingly by what happens inside them, how comfortable they feel, how healthy they are to live in, and how well their interior environments support everyday life. In rapidly growing cities across Nigeria, where housing development is accelerating under intense urban pressure, the choice of interior finishing materials has become a silent but powerful determinant of residential comfort. From wall paints and floor tiles to ceiling systems and surface coatings, these materials do more than define aesthetics; they actively shape thermal conditions, acoustic behaviour, indoor air quality, and even occupants' psychological well-being. These include wall finishes (paint,

tiles, cladding), floor finishes (tiles, marble, timber, vinyl), and ceiling finishes (plaster-of-Paris, gypsum board, PVC panels), and they constitute the primary tactile, visual, thermal, and acoustic interface between the building envelope and its occupants (Clements-Croome, 2018).

A central dimension of housing quality is residential comfort, which refers to the occupant's perception of satisfaction within the indoor environment. Contemporary studies in indoor environmental quality (IEQ) identify residential comfort as a multi-dimensional construct encompassing thermal comfort, acoustic comfort, visual comfort, and indoor air quality (Doshu et al., 2023). These comfort parameters are strongly influenced by building design decisions, particularly the selection and application of interior finishing materials,

which shape the physical and sensory characteristics of indoor spaces.

Interior finishing materials constitute a critical component of residential architecture, defining the internal surfaces of floors, walls, and ceilings while also influencing environmental performance. Materials such as ceramic tiles, paints, gypsum boards, wallpapers, PVC panels, timber, and natural stone are commonly used in residential buildings. Beyond their aesthetic functions, these materials affect heat absorption and retention, sound reflection and absorption, moisture regulation, surface temperature, and pollutant emission levels, all of which directly impact occupant comfort (Akande et al., 2023). Recent empirical evidence from Nigeria suggests that housing materials and interior conditions are significantly associated with indoor air quality challenges, including elevated particulate matter levels and related health risks (Akande et al., 2021). Nigeria is experiencing rapid urbanisation, with the proportion of the population living in urban areas reaching about 63% in 2024, while the urban population continues to grow at more than 3% annually (World Bank, 2025). This growth is placing increasing pressure on housing provision and urban infrastructure. Recent evidence from UN-Habitat also highlights Nigeria's growing housing deficit and the challenges faced by rapidly expanding cities such as Lagos, Ibadan, and Kano (UN-Habitat, 2025). The rapid expansion of urban housing therefore raises concerns not only about the quantity of housing provided but also about the quality and performance of residential environments.

Furthermore, concerns regarding indoor environmental quality have intensified due to increasing awareness of the relationship between built environments and human health. Research in environmental design and building science has established that indoor environmental stressors such as poor air quality, thermal discomfort, excessive noise, and inadequate lighting are closely linked to both physiological and psychological outcomes (Halhoul Merabet et al., 2020). In residential settings, these factors are significantly mediated by the properties of interior finishing materials, making them a crucial but often under-examined determinant of user comfort.

The aim of this study is to assess the use of interior finishing materials in residential architecture and their effects on user comfort in urban Nigeria through a systematic review and thematic synthesis of existing evidence. The study identifies commonly used interior finishing materials in Nigerian residential buildings, examines the factors influencing their selection, evaluates their relationship with user comfort across thermal, visual, acoustic, and psychological dimensions, and synthesises evidence on the challenges and opportunities associated with their use in urban residential contexts. The study is guided by four research questions: what interior finishing materials are commonly used in urban Nigerian residences; what factors influence their selection;

how these materials affect user comfort in residential buildings; and what challenges and opportunities exist regarding their use in urban Nigeria. This review contributes to knowledge by providing a consolidated synthesis of fragmented literature on interior finishing materials and residential comfort in urban Nigeria, addressing a key gap in West African built environment research. Methodologically, it applies a systematic literature review approach to a topic previously dominated by isolated empirical studies, offering a structured framework for future research. Practically, the findings provide guidance for architects, interior designers, quantity surveyors, developers, and housing stakeholders on the comfort implications of material choices. From a policy perspective, it supports the development of material specification guidelines and residential comfort standards, while also encouraging the adoption of locally available and sustainable finishing materials. The study further identifies gaps that inform future research on residential comfort and indoor environmental quality in Nigerian cities.

Conceptual and Theoretical Framework

Concept of Interior Finishing Materials

Interior finishing materials refer to non-structural components applied to internal building surfaces such as floors, walls, and ceilings, which define the functional, aesthetic, and environmental character of interior spaces. Building materials and interior finishes influence the environmental quality, comfort, and overall experience of indoor spaces (Pacheco-Torgal et al., 2024). Common residential finishes include paints, ceramic tiles, timber panels, gypsum boards, wallpapers, plastics, and natural stone, each of which can affect the performance and sensory quality of interiors. They constitute what Zumthor (2006) describes as the 'skin' of inhabited space – the layer through which architecture communicates with the human senses.

Beyond aesthetics, interior finishing materials play a significant role in shaping indoor environmental quality, particularly through their thermal, acoustic, and air-quality performance. Interior finishing materials perform multiple functions at the same time which include, structural protection of the building fabric from moisture, abrasion, and chemical attack, thermal regulation through their surface emissivity, conductivity, and reflectance, acoustic modulation through their absorption, reflection, and diffusion coefficients, visual quality through their colour, texture, and gloss level, and indoor air quality management through their emission or absorption of gases, particulates, and moisture (Clements-Croome, 2018).

Functionally, interior finishing materials serve protective, regulatory, and maintenance roles. They protect structural components, regulate heat transfer, reduce noise transmission, and influence moisture behaviour within buildings. Aesthetically, they contribute to spatial identity, visual coherence, and emotional perception of space, while also

reflecting cultural and socio-economic values (Edwards, 2010). These combined functions position interior finishes as essential mediators between architectural design decisions and occupant experience.

User Comfort in the Built Environment

User comfort in the built environment is a multi-dimensional construct that reflects the interaction between occupants and indoor environmental conditions. It is commonly categorized into physical, psychological, and environmental dimensions. Physical comfort relates to measurable environmental parameters such as thermal conditions, lighting quality, acoustic performance, and spatial ergonomics. Fanger's (1970) foundational work on thermal comfort established that human comfort is directly influenced by environmental balance between heat production and heat loss.

Psychological comfort refers to emotional and cognitive responses to space, including feelings of relaxation, stress reduction, satisfaction, and sense of well-being. Interior experience is influenced by the colour, texture, pattern, and material qualities of finishes, which can shape users' perception, comfort, and preference for interior spaces (Ulusoy, 2020; Kudaligama & Udawattha, 2024). Environmental psychology research has consistently shown that interior spatial qualities influence emotional responses and behavioural outcomes (Gifford, 2014). Environmental comfort involves both physical conditions and occupants' perceptions, including thermal conditions, ventilation, indoor air quality, lighting, and acoustics (Shtrepi & Astolfi, 2023; Zhao et al., 2023).

Theoretical Perspectives

Environmental Comfort Theory

Environmental Comfort Theory, grounded in Fanger's (1970) thermal comfort model, explains comfort as a function of the interaction between environmental conditions and human physiological response. It emphasizes that deviations in thermal, visual, and acoustic conditions directly affect occupant satisfaction and physiological stability. This theory is central to understanding how interior finishing materials influence indoor environmental conditions.

Person–Environment Fit Theory

Person–Environment Fit Theory posits that well-being and satisfaction are achieved when there is congruence between individual needs and environmental conditions. French et al. (1982) argue that mismatch between environmental characteristics and user expectations leads to stress and discomfort. In residential environments, this includes the alignment between material qualities, spatial conditions, and occupant preferences.

Environmental Psychology Theory

Environmental Psychology theory (Gifford, 2007) addresses the bi-directional relationship between the physical

environment and human cognition, affect, and behaviour. In the context of interior finishes, this theory accounts for the role of colour, texture, and material 'richness' in shaping mood, stress levels, perceived quality of space, and social behaviour. The Kaplan and Kaplan (1989) Attention Restoration Theory specifically argues that natural and biophilic materials timber, stone, natural fibres facilitate psychological recovery from cognitive fatigue, a finding with implications for the design of residential interiors.

Literature Review

The review is organised into four thematic clusters, following the structure of the research objectives

Interior Finishing Materials in Residential Buildings

Finishing refers to the final layer applied to building elements to protect surfaces and enhance their functional and aesthetic performance. It forms an interface between the structure and the interior environment, contributing to both the protection and visual definition of spaces. In traditional construction, materials such as stone, timber, and adobe were often left exposed or minimally plastered. However, with modern construction techniques and thinner structural systems, additional finishing layers became necessary to meet performance and comfort requirements. Finishing materials are primarily used on walls, floors, and ceilings to protect surfaces from moisture, heat, abrasion, and general wear. Beyond protection, they also influence the appearance and sensory quality of interior spaces, shaping colour, texture, lighting effects, and ultimately user comfort and perception.

i. Wall Finishes

The first function of wall is to separate spaces from each other vertically, but depending on the structural system of the building it may also carry loads. Wall has to protect the space against the effects of water, moisture, heat, noise, light, fire, etc

Wall finishes represent the most visible and psychologically prominent finishing category in residential interiors. In Nigerian residential buildings, painted and cement-sand wall finishes remain common interior treatments, with recent studies in Akure and Ilorin reporting paint and cement-sand finishes among the most widely used options (Duke-Henshaw & Omale, 2022; Moyo et al., 2026). Oil-based and water-based paints remain widely available in the Nigerian market, with recent evidence raising concerns about hazardous constituents in decorative paints (Akindele & Joseph, 2024).

Ceramic wall tiles are commonly used in Nigerian residential interiors, particularly in kitchens and bathrooms, while their appearance also contributes to the aesthetic quality of the space. Recent studies show that material type and texture influence the perception and quality of living spaces (Duke-Henshaw & Omale, 2022; Hatami Zade et al., 2022). Interior

finishes should therefore be selected according to the function, appearance, colour, and texture of the space.

Different building materials can be used as interior finishing. Plaster, paint, wood, gypsum panel, sandwich panel, ceramic, natural stone, artificial stone, glass and metal can be used as wall finishing materials depending on the architect's specification, clients' choice amongst other factors

ii. Floor Finishes

Floor finishing materials such as ceramic tiles, marble, granite, terrazzo, vinyl, and timber are widely used in residential architecture. Floor materials influence indoor thermal conditions and occupants' thermal perception through differences in their thermal properties (Zhou et al., 2023; Chandrashekar & Kumar, 2023). Hard surfaces such as tiles and stone improve durability but may reduce thermal comfort in cooler conditions, while timber and vinyl offer improved warmth and acoustic performance. Ceramic tiles have become a common floor finish in Nigerian residential buildings. Recent studies in Osogbo and Ikorodu found ceramic tiles to be the most widely used floor finish, particularly in major living spaces (2025).

Ceiling Finishes

Ceiling finishes in residential architecture commonly include plaster of Paris (POP), gypsum boards, timber systems, and polyvinyl chloride (PVC) panels. These materials vary significantly in performance, cost, and environmental implications. Gypsum-based systems are widely recognized for their fire resistance and relatively strong acoustic performance, particularly when combined with perforated or acoustic treatments, making them suitable for higher-quality residential developments. In contrast, PVC ceiling panels have become increasingly popular because of their low cost, ease of installation, and moisture resistance. However, PVC materials may release volatile and semi-volatile organic compounds into indoor environments, depending on their composition and additives (Xue et al., 2023; Bajagain et al., 2025).

In the Nigerian urban residential context, plaster of Paris (POP) remains the most dominant ceiling finish, particularly in middle- and high-income housing. It is typically applied over reinforced concrete slabs and is highly valued for its aesthetic flexibility, allowing for decorative forms such as cornices, coffers, and centre-piece designs that symbolize modern domestic status and architectural refinement. Despite its strong visual appeal, POP ceilings offer limited acoustic absorption due to their dense and reflective surface characteristics, and their thermal contribution is largely restricted to moderating radiant heat transfer from concrete slabs rather than providing significant insulation. Gypsum board ceilings are more commonly found in higher-specification residential buildings, particularly those influenced by contemporary international design standards or developed by formal real estate developers. When properly

detailed with suspended systems and acoustic treatment, gypsum boards can improve sound absorption and enhance indoor acoustic comfort. Conversely, PVC ceiling systems are increasingly used in lower-income housing and renovation projects due to affordability and ease of maintenance. However, PVC ceiling panels have different thermal properties from POP and gypsum systems, which may influence indoor thermal performance. Concerns have also been raised about VOC and SVOC emissions from PVC-based materials, with studies detecting several chemical compounds that may affect indoor air quality (Egbeyale et al., 2024; Xue et al., 2023).

Determinants of Material Selection

i. Economic Factors

Cost and availability are important factors influencing the selection of interior finishing materials in Nigerian residential construction. Rising material prices can limit the choices available to homeowners and developers, while local availability affects the practicality of sourcing and using particular finishes. Recent evidence shows that increases in building-material prices and exchange-rate fluctuations have significantly affected construction costs in Nigeria (Kasim et al., 2023).

Material selection is also influenced by Nigeria's dependence on imported building products. Studies have linked exchange-rate changes and import dependence with rising material costs, highlighting the need to strengthen local production and supply chains (Kasim et al., 2023). These conditions suggest that cost, availability, and market stability remain important considerations in the selection of residential finishing materials.

ii. Environmental Factors

Environmental considerations in material selection are particularly important in Nigeria's tropical climate, where high temperatures and humidity can influence indoor environmental conditions. Recent evidence from South-West Nigeria shows that building materials and building fabrics can affect indoor air quality and thermal comfort (Owolabi et al., 2025). Climate-related changes in the Niger Delta have also been associated with impacts on architecture and the built environment (Dimuna et al., 2025). Material selection should therefore consider climatic conditions, thermal performance, moisture resistance, and durability when designing residential interiors.

iii. Socio-cultural Factors

Social and cultural factors can influence the selection of interior finishing materials in Nigerian housing. In Yoruba architecture, materials, ornamentation, spatial complexity, and other architectural features can communicate wealth, prestige, and social position (Author et al., 2025). Recent evidence from Osogbo also indicates that socioeconomic status and residential type influence users' preferences for floor finishes, alongside considerations such as comfort,

durability, and visual appeal (Ajayi & Yesufu, 2025). Thus, material selection may reflect both functional requirements and users' social and aesthetic preferences.

Interior Finishing Materials and User Comfort

i. Thermal Comfort

Thermal comfort refers to occupants' satisfaction with indoor temperature conditions, which depends on the balance between human heat production and environmental heat exchange. Fanger (1970) established that thermal comfort is achieved when this balance is maintained, and indoor materials contribute to this process through their heat absorption, conductivity, and insulation properties.

In tropical Nigeria, the thermal implications of interior finishing materials are particularly pronounced. Floor finishes directly influence mean radiant temperature, especially in spaces where occupants are seated or in close contact with floor surfaces. Ceramic tiles, due to their high thermal conductivity and low thermal resistance, tend to increase heat transfer and amplify radiant discomfort during peak daytime temperatures in naturally ventilated buildings (Adedeji & Fadamiro, 2013). Comparative research has demonstrated differences in thermal performance among different floor materials (Zhou et al., 2023). Similarly, wall finishes affect thermal performance through their colour, reflectivity, and emissivity characteristics. Dark-coloured paints and highly absorptive surfaces in sun-exposed interiors increase surface temperatures and contribute to higher radiant heat loads, thereby reducing overall thermal comfort.

ii. Visual Comfort

Visual comfort in residential interiors is influenced by daylight availability, colour, surface reflectance, and the distribution of luminance within a space. Interior finishes therefore contribute to visual conditions by affecting how light is reflected and distributed across walls, ceilings, floors, and other surfaces. Recent studies in Nigeria have shown that daylighting and visual comfort are influenced by building orientation, window design, and shading conditions (Fadeyi et al., 2024; Musa & Garba, 2023). High-reflectance surfaces can improve daylight distribution, while excessive reflections or uncontrolled daylight may increase glare and visual discomfort. Material and finish selection should therefore be considered alongside window orientation and shading when designing comfortable residential interiors.

iii. Acoustic Comfort

Acoustic comfort is determined by sound absorption and reflection characteristics of interior materials. Soft materials such as timber and carpets improve sound absorption, while hard surfaces like tiles and stone increase reverberation, affecting comfort levels in residential spaces (Al horr et al., 2016).

iv. Indoor Air Quality

Indoor air quality is influenced by emissions from building and finishing materials, particularly volatile organic compounds (VOCs) and formaldehyde. Recent reviews identify finishing materials, furnishings, and building components as important sources of indoor pollutants in residential environments (Baeza-Romero et al., 2022). Studies have also shown that interior finishes can release VOCs during and after installation, with concentrations varying according to material type and environmental conditions (Xue et al., 2024). Formaldehyde emissions are of particular concern in wood-based panels and other products containing adhesives and resins (Zhang et al., 2022). These findings highlight the importance of considering material emissions when selecting interior finishes for healthy residential environments.

v. Psychological and Emotional Comfort

Psychological comfort is influenced by occupants' responses to the sensory qualities of interior materials. Colour, texture, material type, and surface characteristics can affect how occupants perceive and experience indoor spaces (Zhao et al., 2023; Kudaligama & Udawatttha, 2024). Recent research shows that interior materials can influence perceived restorativeness and psychological responses in residential environments, with some materials associated with greater feelings of warmth, pleasantness, and comfort (Zhao et al., 2023). In the Nigerian context, material preferences may also reflect social and cultural meanings, as architectural materials and decorative elements can communicate status and wealth within Yoruba residential environments (Dimuna et al., 2025). Material selection should therefore consider both physical performance and occupants' psychological and cultural responses.

Sustainability and Local Material Alternatives

i. Sustainable Interior Materials

Sustainable interior finishing materials are those that reduce environmental impacts across their life cycle while meeting required functional and performance standards. Life Cycle Assessment (LCA) provides a systematic approach for evaluating these impacts from material production through use and end-of-life stages (Prideaux et al., 2024; Theilig et al., 2024). In Nigeria, materials such as bamboo, laterite, earth-based products, and other locally available alternatives have potential for more sustainable construction because of their resource availability and environmental benefits (Unegbu et al., 2025). However, their wider adoption remains limited by factors including cost, limited availability, inadequate standards, technical constraints, and weak regulatory support (Eze et al., 2023; Unegbu et al., 2025). These barriers continue to influence the acceptance of sustainable alternatives within the Nigerian construction sector.

ii. Indigenous and Local Materials

Indigenous and locally sourced materials offer opportunities to improve affordability, environmental performance, and climate responsiveness in Nigerian residential construction. Their use can reduce dependence on energy-intensive conventional materials while making greater use of locally available resources. Recent Nigerian research has demonstrated the sustainability potential of materials such as bamboo and other alternative building materials. Unegbu et al. (2025), for example, found bamboo to have the lowest environmental impacts among the materials assessed through life-cycle analysis. However, the wider adoption of such materials remains constrained by factors including cost, limited availability, inadequate standards, technical limitations, and weak regulatory support (Unegbu et al., 2025; Ekhaese et al., 2024). Greater attention to technological development, quality standards, and local production could therefore support their wider application in residential construction.

Circular Economy and Material Reuse

The circular economy approach promotes resource efficiency through the reuse, recycling, and recovery of materials, with the goal of minimizing waste and extending material lifecycles. Within the built environment, this model is increasingly recognized as a key strategy for achieving sustainable construction by reducing material consumption and optimizing lifecycle performance (Ellen MacArthur Foundation, 2019).

Applied to interior finishing materials, circular economy principles encourage design for disassembly, material recovery, and the reuse of components at the end of a building's service life. Although these principles remain largely absent from formal residential construction practices in Nigeria, informal reuse activities are common, particularly the salvage of tiles, timber, metal components, and other reusable materials from demolition sites. The formalization of such practices through reclaimed material markets, tile exchange platforms, and organized salvage networks presents an opportunity to reduce construction waste, lower material costs, and improve the environmental performance of the residential sector.

Furthermore, the integration of lifecycle assessment into material selection can support circular economy objectives by quantifying embodied carbon, resource consumption, and long-term environmental impacts. According to Ogunkah and Yang (2012), evaluating materials based on lifecycle costs and environmental performance provides a more comprehensive basis for decision-making than relying solely on initial procurement costs. Consequently, adopting circular economy principles within the selection and management of interior finishing materials could contribute significantly to more sustainable and resource-efficient residential development in Nigeria.

Findings and Thematic Synthesis

Common Interior Finishing Materials Used in Urban Nigeria

The reviewed studies reveal a highly standardized interior finishing material palette across urban Nigerian residential buildings, with only limited variation across cities, housing typologies, and income groups. Ceramic tiles emerge as the dominant floor and wall finishing material, appearing in the vast majority of documented residential projects. Their widespread adoption is attributable to their perceived durability, ease of maintenance, moisture resistance, and strong association with modern housing standards. Emulsion paint applied over smooth cement plaster remains the near-universal wall finish in non-wet spaces, while plaster of Paris (POP) ceilings dominate middle- and high-income residential developments. In contrast, terrazzo, which once represented the preferred floor finish in Nigerian housing before the 1990s, is now largely restricted to older housing stock and selected institutional buildings.

A notable finding is that material differentiation within contemporary Nigerian housing is less a matter of material type than of specification quality. Variations occur primarily through the use of branded versus unbranded ceramic tiles, premium versus economy paint formulations, and the complexity of POP ceiling designs. In many instances, ceiling treatments function as visible indicators of social status and household prosperity. The synthesis further reveals a striking absence of natural, organic, and indigenous materials within the contemporary residential interior environment. Despite Nigeria's tradition of using locally sourced materials such as bamboo, laterite, timber and earth-based finishes, their adoption in contemporary urban housing remains limited. Recent studies on sustainable construction in Nigeria identify cost, availability, technical knowledge, market acceptance and regulatory support as factors constraining the wider adoption of local and sustainable materials (Daramola et al., 2025; Unegbu et al., 2025).

Factors Influencing Material Selection

The evidence consistently identifies cost as the most influential determinant of interior finishing material selection across all categories of residential development. However, the synthesis demonstrates that material selection decisions are shaped by a complex interaction of economic, environmental, socio-cultural, and market-related considerations. Initial procurement cost remains the principal concern for most homeowners and developers, particularly within self-built and low-income housing. Maintenance requirements and long-term durability further influence decisions, often favouring ceramic tiles and POP ceilings because of their perceived ability to reduce future maintenance expenses.

Beyond economic considerations, the review reveals that prestige and social perception significantly influence material

choices, particularly in middle- and upper-income housing. Imported materials are frequently preferred not necessarily because of superior technical performance but because they are associated with quality, modernity, and social status. In such cases, symbolic value often outweighs objective performance criteria. The preference for imported ceramic tiles, synthetic ceiling systems, and branded paint products illustrates how residential material choices are embedded within broader cultural aspirations and lifestyle expectations.

Environmental factors such as climate responsiveness and durability also feature prominently in the literature. However, these considerations often receive less attention during specification than issues of cost and aesthetics. Several studies indicate that materials are frequently selected without adequate consideration of their suitability for Nigeria's hot-humid climatic conditions, resulting in premature deterioration and reduced indoor comfort performance (Iwaro & Mwashia, 2010). The review additionally identifies contractor and supplier influence as a significant but underreported determinant. In many residential projects, homeowners delegate material selection to contractors, whose decisions are frequently guided by familiarity, supplier relationships, ease of installation, and product availability rather than evidence-based comfort or sustainability considerations. Consequently, opportunities for performance-oriented material selection are often lost during the construction process.

Effects of Interior Finishing Materials on User Comfort

The synthesis demonstrates that interior finishing materials significantly influence residential comfort through thermal, visual, acoustic, air-quality, and psychological pathways. Across the reviewed studies, thermal comfort emerged as one of the most consistently affected dimensions. Evidence indicates that the widespread use of ceramic floor tiles, smooth plastered walls, and POP ceilings contributes to elevated indoor temperatures and increased radiant heat loads within naturally ventilated residential buildings. Studies conducted in tropical Nigerian cities report operative temperatures that frequently exceed recommended adaptive comfort limits during afternoon peak periods, suggesting that prevailing finishing material choices may amplify rather than mitigate thermal discomfort (Akinbogun et al., 2021).

Visual comfort findings reveal a more complex relationship between material characteristics and occupant experience. Light-coloured paints and highly reflective ceiling finishes generally improve daylight penetration and interior brightness. However, polished ceramic tiles, marble surfaces, and glossy finishes often generate glare and visual discomfort, particularly in residential buildings characterized by large, unshaded window openings. Since occupants typically exhibit lower tolerance for visual discomfort within domestic environments than in workplaces, material

reflectance and surface finish become important determinants of residential satisfaction.

Acoustic performance emerged as a particularly weak aspect of contemporary Nigerian residential interiors. The dominance of hard, dense, and reflective materials including ceramic tiles, plastered walls, and POP ceilings creates interior environments characterized by excessive sound reflection and elevated reverberation times. This reduces speech intelligibility and overall acoustic comfort, particularly in compact urban housing units. Similar concerns arise with indoor air quality. The literature identifies paints, adhesives, PVC ceiling systems, and composite wood products as important sources of volatile organic compounds (VOCs) and formaldehyde emissions. Although empirical studies on residential indoor air quality in Nigeria remain limited, available evidence suggests that Finishing materials can contribute to indoor pollutant loads through the emission of VOCs and other compounds, although residential evidence specific to Nigeria remains limited (Baeza-Romero et al., 2022; Xue et al., 2023)

Despite these physical comfort limitations, the review consistently reports high levels of occupant satisfaction with prevailing finishing materials. This apparent contradiction is explained by the psychological and cultural meanings attached to certain materials. Elaborately moulded POP ceilings, polished ceramic tiles, and glossy paint finishes are widely perceived as symbols of modernity, achievement, and social success. Consequently, occupants often express positive evaluations of interior environments even when objective thermal, acoustic, or air-quality indicators suggest underperformance. This divergence between subjective satisfaction and measurable comfort outcomes represents one of the most significant findings of the review and highlights the need for more holistic approaches to residential design assessment.

Sustainability Issues and Future Directions

The final theme highlights significant sustainability challenges associated with current interior finishing practices in urban Nigeria. Environmentally, the residential sector remains heavily dependent on imported, energy-intensive materials such as ceramic tiles, PVC panels, synthetic coatings, and solvent-based paints. The production, transportation, and disposal of these materials contribute substantially to embodied carbon emissions and resource consumption, creating environmental burdens that could potentially be reduced through greater use of locally sourced alternatives.

The review further reveals that sustainability challenges extend beyond environmental concerns. Economically, dependence on imported finishing materials exposes homeowners and developers to foreign exchange fluctuations, supply-chain disruptions, and escalating construction costs. Socially, the gradual replacement of indigenous materials by

industrial products has weakened local production systems and diminished traditional construction knowledge. These trends collectively undermine the resilience and sustainability of the residential building sector.

Nevertheless, the evidence identifies several promising pathways for future improvement. Indigenous materials such as bamboo-based panels, laterite-stabilized finishes, and natural lime plasters demonstrate significant potential to provide environmentally responsive, affordable, and healthier alternatives to conventional materials. Their broader adoption, however, requires the development of standardized quality specifications, performance testing protocols, and market acceptance mechanisms. The review also highlights the importance of integrating lifecycle assessment, embodied carbon evaluation, and comfort-performance criteria into residential material selection frameworks.

Another emerging opportunity lies in the application of circular economy principles. While informal material salvage and reuse practices already occur within Nigeria's construction sector, formal systems for reclaiming, exchanging, and recycling interior finishing materials remain largely undeveloped. Establishing reclaimed-material markets, demolition salvage networks, and material exchange platforms could reduce waste generation, lower construction costs, and improve resource efficiency. Collectively, the findings suggest that achieving more sustainable residential interiors in Nigeria will require coordinated efforts involving policy reform, industry capacity building, consumer awareness, and the promotion of evidence-based material selection practices. Ultimately, future residential development must move beyond short-term procurement considerations toward a broader evaluation of lifecycle performance, occupant comfort, and environmental responsibility.

Discussion

Interpretation of Findings

The findings of this systematic review reveal a structural tension within the residential interior finishing material ecosystem in urban Nigeria, where culturally and economically rational selection practices increasingly diverge from evidence-based comfort and sustainability imperatives. The dominance of ceramic tiles, emulsion paints, and plaster of Paris (POP) ceilings reflects an embedded incentive structure shaped by cost minimisation, perceived durability, aesthetic aspiration, and social prestige. Within a context of weak regulatory enforcement, limited access to performance data, and an underdeveloped material standards regime, these factors collectively override considerations of thermal performance, acoustic quality, and indoor environmental health.

From a theoretical standpoint, Person–Environment Fit theory (French et al., 1982) provides a useful explanatory lens for this mismatch. The reviewed evidence demonstrates a

persistent incongruence between the physical properties of prevailing finishing materials and the climatic demands of hot-humid urban environments in Nigeria. Hard, impervious, and high thermal mass finishes contribute to elevated indoor temperatures and reduced adaptive comfort potential, thereby producing a systemic environmental misfit. However, this misfit is partially obscured by psychological and cultural mediations of comfort perception. Materials such as POP ceilings and glossy tiles are strongly associated with modernity, success, and residential status, allowing occupants to express high levels of satisfaction even in environments that underperform in objective comfort metrics. This dissociation between perceived and actual comfort helps explain the persistence of suboptimal material systems in post-occupancy evaluations.

Comparison with Global Literature

The findings are consistent with studies showing that economic considerations influence building-material choices, particularly where affordability remains a major concern. Recent Nigerian studies similarly identify the cost of conventional materials as a challenge to affordable and sustainable housing, while highlighting the potential of locally available alternatives (Akinkunmi, 2022; Okonta, 2023). However, the findings also suggest that material choices are influenced by appearance and prestige, indicating that interior finishes are valued for both functional and social reasons.

The findings also have implications for indoor environmental quality. Building materials and interior finishes can affect thermal conditions and indoor air quality, particularly through their influence on heat transfer and the emission of VOCs (Okonta, 2023; Baeza-Romero et al., 2022; Wang et al., 2022). Recent research has further shown that materials used indoors can release VOCs and other pollutants, making material selection an important consideration in maintaining healthy indoor environments (Arar et al., 2022; Salthammer, 2022). The limited availability of locally based evidence on material emissions in Nigeria therefore remains an area requiring further investigation.

The underuse of indigenous materials also remains a concern. Recent Nigerian studies indicate that locally available materials such as earth and laterite can provide more affordable and environmentally responsive alternatives, although their wider adoption remains limited (Akinkunmi, 2022; Oloruntoba, 2024). This suggests that greater attention should be given to material cost, environmental performance, availability, and user preferences when promoting sustainable material choices in Nigerian housing.

Implications for Residential Design Practice

The findings have direct implications for architectural and interior design practice in urban Nigeria. First, they underscore the need to shift from intuition- and aesthetics-driven material selection toward performance-based

specification grounded in measurable environmental data. Parameters such as thermal conductivity, emissivity, acoustic absorption, should form part of standard material evaluation criteria rather than being secondary considerations.

Second, climate-responsive material selection is essential for improving residential comfort in hot-humid environments. Materials with lower thermal conductivity and better hygrothermal performance, such as sealed terrazzo, natural stone with appropriate finishes, and breathable wall systems, can reduce heat accumulation without significantly increasing construction costs. Similarly, the integration of low-VOC or zero-VOC water-based paints should become standard practice, given their proven advantages in maintaining indoor air quality without compromising durability.

Third, acoustic comfort deficiencies identified in the review suggest a need for integrating sound-absorptive elements into residential interiors. This may include acoustic ceiling inserts within POP systems, textile-based finishes, and spatial layering strategies that reduce reverberation in hard-finished environments. Importantly, these interventions must be embedded within mainstream design practice rather than treated as luxury additions.

Implications for Urban Housing Policy

At the policy level, the findings expose a significant regulatory gap in the governance of interior environmental quality in Nigerian housing. Unlike energy performance or structural safety, there is currently no enforceable framework governing indoor comfort standards or material emissions in residential buildings. This absence allows material selection to remain largely market-driven, with limited accountability for occupant comfort outcomes.

The National Building Code (2006) does not provide explicit performance standards for interior finishing materials, particularly in relation to thermal comfort, acoustic performance, or indoor air quality. Addressing this gap requires the development of a national indoor environmental quality (IEQ) framework tailored to residential buildings. Such a framework should establish minimum thresholds for material emissions, thermal performance expectations, and acoustic comfort criteria.

In addition, fiscal and regulatory incentives could be used to shift material markets toward more sustainable options. These may include reduced import duties on certified low-emission materials, tax incentives for locally produced sustainable finishes, and procurement policies that favour environmentally responsible products. Embedding material performance education within architectural and construction training programmes is also essential to improve specification practices across the industry.

Conclusion and Recommendations

Conclusion

This systematic review has assessed the use of interior finishing materials in residential architecture and their effects

on user comfort in urban Nigeria. The evidence reveals a persistent and structurally embedded tension between current material selection practices shaped primarily by cost, prestige, and contractor habit and the thermal, acoustic, air-quality, and psychological comfort imperatives that a rigorous evidence base increasingly demands be addressed.

The dominant interior finishing palette of urban Nigerian residences ceramic tiles, emulsion paint on cement plaster, and plaster-of-Paris (POP) ceilings reflects rational responses to a market environment characterised by weak regulatory governance, limited performance data, and strong socio-cultural associations between imported industrial materials and modernity. However, this systematically produces elevated indoor temperatures in hot-humid conditions, excessive acoustic reverberation, and measurable indoor air quality risks from VOC emissions. The dissociation between high occupant satisfaction driven by the psychological and status value of prestige finishes and objectively suboptimal environmental performance is among the most significant findings of the review, and one that poses a fundamental challenge for evidence-based design guidance. The review further establishes that local, indigenous, and sustainable alternatives including, natural lime plasters, and bamboo-based panels are technically viable and cost-competitive on a lifecycle basis, yet remain systematically marginalised by market, cultural, and regulatory barriers. Addressing this gap requires coordinated intervention across design practice, materials supply chains, housing policy, and professional education.

Recommendations

Architectural and interior design practice in urban Nigeria should adopt performance-based material selection criteria that consider thermal conductivity, acoustic absorption, and VOC emission rates alongside cost and aesthetics. This would ensure that material decisions are guided not only by appearance and affordability but also by measurable comfort performance outcomes. Low-VOC or zero-VOC water-based paints should be used as a standard specification across all residential projects due to their proven ability to improve indoor air quality without reducing durability or performance. Designers should also give greater consideration to locally sourced alternatives such as sealed terrazzo, laterite-stabilised finishes, and lime plasters, especially where lifecycle cost and comfort benefits can be demonstrated. Acoustic comfort should be improved by incorporating absorptive elements such as acoustic ceiling inserts, textile finishes, or spatial layering in hard-finished interior spaces. Post-occupancy evaluations should be routinely conducted to build a local evidence base linking material choices to actual comfort outcomes in Nigerian residential buildings.

Developers should adopt lifecycle costing approaches to demonstrate the long-term economic value of sustainable and locally sourced materials, rather than focusing only on initial cost. They should also reposition sustainable materials in the

market as quality options, not low-cost alternatives, since perception strongly influences selection decisions. Indoor environmental quality benchmarks covering thermal, acoustic, and air quality performance should be integrated into residential specifications to differentiate products in the housing market. Collaboration with local manufacturers is also important to strengthen supply chains for sustainable finishing materials.

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