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REVIEW

African Facial Anthropometry and Spectacle Frame Design: A Review

Sanele Buthelezi*, Nabeela Hasrod*

Department of Optometry, Faculty of Health Sciences, University of Johannesburg, Johannesburg, Gauteng, South Africa

*These authors contributed equally to this work

Correspondence: Sanele Buthelezi, Department of Optometry, Faculty of Health Sciences, University of Johannesburg, P.O Box 17077, Doornfontein, Johannesburg, 2028, South Africa, Tel +2711559 6387, Email saneleb@uj.ac.za

Abstract: This narrative review explores the relationship between African facial anthropometry and spectacle frame design. Despite the global eyewear market's growth, a significant gap exists in designs accommodating African facial features. Through a comprehensive literature analysis, this review examines key anthropometric measurements relevant to eyewear fit across diverse African populations, current challenges in spectacle frame design, and emerging solutions. Findings reveal persistent underrepresentation of African facial measurements in global design standards, leading to poor fit, discomfort, and reduced compliance. The review identifies opportunities for innovative frame designs, material selection, and manufacturing approaches that could better serve African populations. Recommendations include increased anthropometric research across different African ethnicities, integration of digital technologies, and development of region-specific design parameters. This review contributes to the growing body of knowledge advocating for more inclusive and culturally appropriate eyewear solutions.

Keywords: spectacle frame design, ophthalmic anthropometry, eyewear, inclusive design

Introduction

Vision correction through spectacle wear represents a critical healthcare intervention globally, with uncorrected refractive error remaining one of the leading causes of visual impairment worldwide.[1] While advancements in optical lens technology have significantly improved vision correction capabilities, delivering these benefits ultimately depends on proper spectacle fit. Ill-fitting frames cause physical discomfort and can lead to optical misalignment, reduced compliance, and persistent visual impairment.[2–4]

The global eyewear market continues to expand and is projected to reach USD 178.95 billion by 2026.[5] However, this growth has not been accompanied by equivalent advances in frame designs that accommodate global populations' anthropometric diversity. Particularly in Africa, where over 1.3 billion people represent tremendous genetic and phenotypic diversity, the availability of properly fitting eyewear remains a significant challenge.[1,6,7]

Historical and contemporary eyewear design has predominantly been informed by European and, more recently, East Asian anthropometric measurements.[3] These standards often fail to accommodate the distinct facial features common across various African populations, including differences in nasal bridge height, interpupillary distance, facial width, and orbital structure.[8,9] The result is a substantial disparity in eyewear fit for many African consumers, contributing to discomfort, dissatisfaction, and reduced adherence to the prescribed vision correction.[3]

The implications of this design mismatch extend beyond mere comfort, affecting clinical outcomes, social acceptance of eyewear, and market accessibility. As vision care programs expand across Africa, addressing this fundamental challenge of appropriate frame design becomes increasingly important for sustainable eye health interventions.[10]

This narrative review aims to synthesize existing literature on African facial anthropometry related to spectacle frame design, explore current challenges in eyewear fit for African populations, and identify emerging solutions and opportunities in this field. By bridging knowledge from anthropometry, optical design, materials science, and cultural

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considerations, this review seeks to contribute to developing more inclusive and appropriate eyewear solutions for African consumers.

Methodology

This study employed a narrative review approach to synthesize existing literature on African facial anthropometry and its implications for spectacle frame design. A comprehensive search was conducted using academic databases, including PubMed, Google Scholar, Scopus, and EBSCOHost. Keywords used in the search included “African facial anthropometry”, “spectacle frame design”, “eyewear fit”, “craniofacial dimensions”, “spectacle frame design”, and “ethnic variations in eyewear.”

Inclusion criteria comprised peer-reviewed journal articles, books, and industry reports providing insight into the anthropometric characteristics of African populations and their relevance to eyewear design. Studies published between 2000 and 2025 were prioritised to ensure contemporary relevance, though seminal older works were included where appropriate. Studies focusing exclusively on Eurocentric and Asian facial models without comparative analysis were excluded.

The literature retrieved was reviewed for key themes, including nasal bridge structure, facial width, temple length, head shape, and cheekbone prominence. Additionally, studies on material innovations, technological advancements, and localised eyewear production were considered to explore solutions for improving spectacle frame fit for African users.

Data were analyzed qualitatively to identify trends, challenges, and future research and product development implications. This methodological approach ensures a comprehensive understanding of the subject matter while highlighting the gaps in the existing literature that warrant further investigation.

Anthropometric Considerations in Spectacle Frame Design

Critical Facial Measurements for Eyewear Fit

The proper fit of spectacle frames depends on several key facial measurements that determine how frames sit on the face and align with the eyes. These critical measurements include:

Interpupillary Distance (IPD)

The distance between the pupil centres affects lens centration and the optical performance of spectacles. Research has demonstrated significant variations in IPD across different populations, with implications for frame bridge width requirements.[8,11,12]

Nasal Root Height and Width

The height and width of the nasal root directly impact how frames sit on the face. A lower nasal bridge height may cause frames to slide down, while width variations affect pressure distribution and stability.[13]

Bitragal Width

This measurement across the face at the ear level influences the required frame width and temple length. Frames that are too narrow or wide relative to this measurement cause discomfort through excessive pressure or instability.[14]

Frontozygomatic Distance

The distance between the outer corners of the eye orbits affects frame front size and lens positioning. This measurement varies significantly across populations and may impact peripheral vision through spectacle frames.[15–17]

Head Circumference

This measurement influences temple length requirements and overall frame stability. Variations in head circumference affect the tension required for frames to remain secure without causing discomfort.[11,15]

Vertex Distance

The distance from the corneal apex to the back surface of the spectacle lens affects optical performance, particularly for higher prescriptions. Anthropometric variations influencing this distance have direct clinical implications.[18]

These measurements form the foundation for ergonomic frame design, with deviations from the intended fit potentially causing both physical discomfort and optical performance issues. Studies by Naude and Campbell,[3] Halladay et al,[11] Rosyidi et al.,[15] and Tian and Ball[19] have demonstrated that even small discrepancies between facial anthropometry and frame dimensions can significantly impact the wearers' comfort and compliance.

The following diagram depicts anthropometric measurements that may be relevant to spectacle frame design (Figure 1):

African Facial Anthropometry: Key Findings

Research on African facial anthropometry has revealed distinct patterns that differentiate these populations from European and Asian groups for whom most spectacle frames are designed. While acknowledging the tremendous diversity within the African continent, several commonalities have been identified that have particular relevance to eyewear design:

Nasal Bridge Characteristics

The nasal bridge represents one of spectacle fit's most critical anatomical features. Research has consistently demonstrated significant variation in nasal bridge dimensions across different African populations. Farkas et al[20] conducted comprehensive anthropometric studies across multiple ethnic groups and found that individuals of African descent typically present with wider and flatter nasal bridges compared to Caucasian populations.

Interpupillary Distance

Pivnick documented that African populations generally exhibit wider interpupillary distances compared to European counterparts.[21] Their research indicated a mean IPD of approximately 66.1 mm in adult African males compared to or mm in European males. Whilst in more recent studies, Halladay et al[11] noted that Malawi children could wear eyewear designed for the Chinese population. This further highlights the variation in interracial facial anthropometric measurements. A study by Butler et al,[22] noted that the mean IPD was significantly greater than international standards used in mass-produced eyewear, suggesting potential issues with optical centration in standard spectacle frames. Modrolu et al[23] and Moodley et al[2] emphasised that improper alignment of optical centres, often resulting from inappropriate IPD consideration in eyewear design, can induce prismatic effects, causing visual discomfort and adaptation issues.

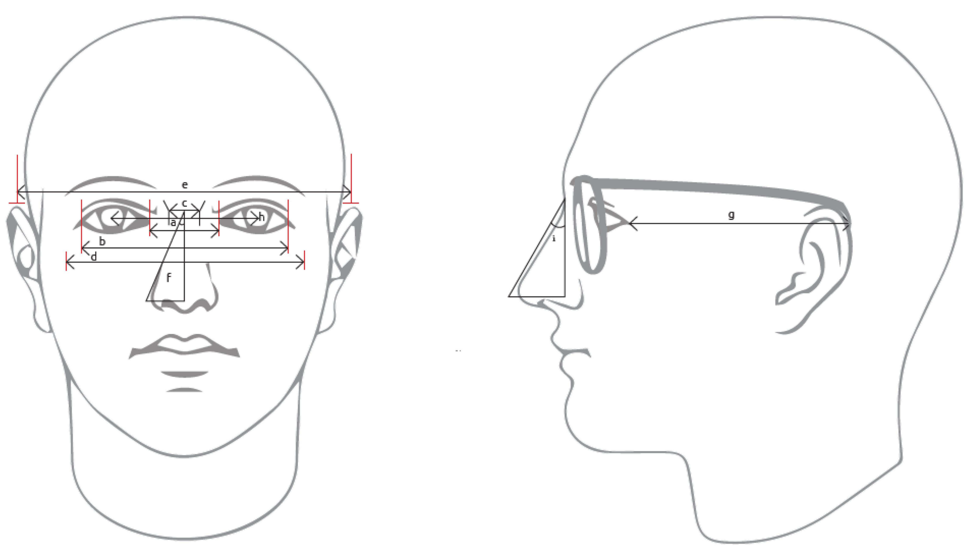

Figure 1 Facial anthropometric measurements relevant to spectacle frame design (*designed by authors*). (**a**) Inner-intercanthal distance. (**b**) Outer-intercanthal distance. (**c**) Nose width. (**d**) Face width. (**e**) Head width. (**f**) Frontal angle. (**g**) Temple length. (**h**) interpupillary distance. (**i**) crest angle.

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Facial Width Measurements

Oladipo et al[16] conducted anthropometric studies in Nigeria and found that bizygomatic width (the maximum distance between the most lateral points of the zygomatic arches) was significantly greater in their study population compared to Caucasian reference standards. In another comparative study of facial dimensions across multiple ethnicities, they noted that African populations typically exhibited greater facial width-to-height ratios than Asian and European populations.[9] This finding has significant implications for temple length and frame front dimensions in eyewear design.

Bitemporal Proportions

Ofodile and Bhokari[24] documented greater bitemporal widths in African populations than European reference standards. Their work suggested that standard eyewear frames often provide insufficient temple coverage for individuals of African descent. Naude and Campbell[3] highlighted that ill-fitting temple dimensions represent one of the most common complaints among African eyewear consumers, with many reporting discomforts due to excessive temple pressure or insufficient temple length.

Orbital Structure

Barretto and Mathog[25] observed that African populations typically present with larger orbital apertures and more slightly rectangular orbital shapes compared to the more circular orbits common in European populations. Jilani et al[26] documented greater orbital heights in African populations compared to Asian populations, while orbital widths were comparable. These findings suggest the need for different approaches to lens shape and frame design to appropriately accommodate these variations.

These anthropometric differences have substantial implications for spectacle fit. Conventional frames, which are typically designed based on European facial structures often create fitting challenges for African wearers. Common issues include frames slipping down the nose due to lower nasal bridge height, bridge pinching or visible gaps resulting from broader nasal structures, and temple discomfort or looseness caused by variations in head circumference. Additionally, differences in IPD can lead to optical misalignment, while variations in orbital and cheekbone structure may result in frame front instability or localized pressure points, ultimately compromising both comfort and visual performance.

Regional Variations Within Africa

While certain anthropometric patterns appear common across African populations, significant regional variations exist that further complicate spectacle frame design. The continent's tremendous genetic diversity manifests in measurable craniofacial differences between populations:

Southern Africa

Black South African women exhibit wider nasal widths, averaging 40.4 mm in a study conducted by Wilson et al[9] and greater nasal tip projection compared to the Congolese and African American populations. Their facial height proportions also diverge from neoclassical norms, with shorter upper facial thirds relative to mid and lower thirds.[9] Among Zimbabwean rural populations, studies show narrower interpupillary distances of 60.7 mm in males and 59.5 mm in females but larger bitemporal width of 147.7 mm in males and 141.3 mm in females compared to Asian and Caucasian populations.[27] These metrics conflict with standard frame designs, leading to discomfort and poor fit.

Eastern Africa

Studies have shown that Kenyan and Sudanese populations exhibit distinct midface-to-lower face ratios compared to Southern African groups, necessitating adjustments in frame curvature and lens positioning.[9]

West Africa

Schoolchildren in Enugu, Nigeria, prioritize frame aesthetics, favouring oval shapes 47.2% and metallic colours 29.5%, with rural children more likely to choose thicker frames.[28] These preferences intersect with anthropometric needs, such as broader head widths observed in Ghanaian studies.[29] West African populations generally have shorter front-to-bend measurements than Southern African groups, possibly influencing the sidepiece design.

North Africa

Limited published data exists, but proximity to Mediterranean and Middle Eastern populations suggests narrower nasal bridges and smaller head widths compared to sub-Saharan regions. Urban centres like Cairo may exhibit hybrid features due to migration, though rural areas likely retain more homogeneous traits.

The following Table 1 is a summary of key facial anthropometric measurements relevant to spectacle frame design – specifically, nasal width, nasal bridge height, intercanthal width, facial width, and temple length, across African, European, and Asian populations. These values are means or typical ranges reported in relevant literature.

Urban vs Rural Dynamics in Eyewear Fit and Access

The dynamics of spectacle frame access, use, and fit vary significantly between urban and rural settings, influenced by differences in infrastructure, cultural perceptions, and facial anthropometry.

Access and Infrastructure

Urban areas host optical chains and private optometry practices offering a wide selection of spectacle frames, including modern, customizable options. These environments often support onsite adjustments and professional fittings. In contract, rural regions are more reliant on sporadic outreach services or informal vendors who supply generic, often ill-fitting frames.[34] For example, in rural Zimbabwe, 54.2% of vision impairment due to uncorrected refractive error is exacerbated by limited access to eyecare services and appropriate spectacle correction.[27,35]

Cultural Perceptions

Cultural attitudes toward spectacles differ between urban and rural populations. Urban youth tend to view eyewear as both a vision aid and a fashion accessory, often favouring lightweight, trendy, and expressive frame styles.[28,34] In contrast, many rural populations perceive spectacles primarily as medical devices, which contributes to lower adoption rates and poor compliance. Negative beliefs or stigma surrounding spectacle wear—especially for children—persist in some rural areas, where they may be associated with illness, disability, or age.[34] These perceptions can undermine public health efforts to improve visual outcomes through corrective eyewear.

Anthropometric Variability

Urbanisation and migration patterns have led to increased diversity in facial features within city populations, resulting in a wider range of anthropometric measurements. This necessitates the availability of adjustable or customisable frame designs to accommodate the heterogeneity in facial dimensions. Conversely, rural populations often exhibit more homogenous anthropometric profiles, which theoretically allows for targeted frame designs. However, these communities typically lack access to frames tailored to their specific facial dimensions. Generic imported frames—usually based on European or East Asian facial standards—fail to align with the broader nasal widths, flatter nasal bridges, and wider interpupillary distances more common in African rural populations.[34]

This analysis underscores the need for location-specific approaches in spectacle frame design, distribution, and promotion. Addressing rural-urban disparities requires not only improved infrastructure and access but also culturally sensitive, anthropometrically appropriate eyewear solutions that promote comfort, compliance, and visual health equity.

Table 1 A Summary of Key Facial Anthropometric Measurements Relevant to Spectacle Frame Design

Measurement	African Population	European Population	Asian Population
Nasal Width	45 – 48 mm (wider base)[30,31]	34 – 36 mm (narrower base)[30,31]	38 – 41 mm (moderate, broad base)[30,31]
Nasal Bridge Height	Lower, less projected[31,32]	Higher, more projected[31,32]	Low to moderate[31,32]
Intercanthal Width	38.5 ± 3.2 mm[33]	31.4 ± 2.5 mm[33]	36.4 ± 1.6 mm[33]
Facial Width	139 – 149 mm[30]	131 – 143 mm[30]	143 – 150 mm[30]
Temple Length	Typically, longer due to a wider face[30]	*Standard* (tends to vary with face width)[30]	Slightly shorter, but varies[30]

Current Challenges in Spectacle Frame Design in African Populations

Commercial Availability and Market Gaps

The global eyewear industry has historically underserved African markets with appropriately designed frames. Several factors contribute to this persistent gap:

Dominance of Eurocentric Design Standards

Globally, the spectacle frame industry continues to be dominated by Eurocentric anthropometric norms. Over 80% of eyewear designs are based on European and North American facial measurements,[3] resulting in widespread fit mismatches for many African consumers. This legacy of Eurocentric design undermines comfort, stability, and visual performance in African populations, whose craniofacial dimensions often differ significantly.

Limited Market Research

Major eyewear manufacturers have historically invested minimal resources in understanding African consumer needs. Unlike the Asian market—where extensive anthropometric research has led to tailored frame designs—African populations remain underrepresented in global design strategies. Naude and Campbell[3] highlight that African-specific research and development are scarce, with limited local data informing global product lines.

Supply Chain Challenges

The distribution of eyewear in many African markets faces significant logistical hurdles. Key issues include poor transportation infrastructure:

- *Transportation Infrastructure Limitations*: Poor road conditions, long lead times due to border delays, and security concerns (including theft during transit) severely impact the timely and safe delivery of eyewear products. Studies in South Africa highlight how defective roads cause damage to transport fleets and products, while border congestion and customs delays further extend delivery times, increasing costs and risks.[36] Additionally, congestion in urban centres can cause delays of days, complicating distribution planning.
- *Impact on Manufacturers*: These logistical challenges disincentivise major eyewear manufacturers from investing in Africa-specific product lines because the cost and complexity of distribution reduce profitability and market predictability.[36,37]

Price Sensitivity

African markets are highly price-sensitive, which creates tension between the need for specialised, culturally appropriate eyewear designs and affordability:

- *Willingness to Pay*: Research indicates that low- and middle-income consumers in low- and middle-income countries (LMIC), including many African markets, are willing to pay no more than about 10% of their monthly income for spectacle, often equating to just a few dollars (eg, around $3.80). This price sensitivity is driven by limited disposable income and competing priorities.
- *Premium Pricing for Specialised Designs*: Spectacle frames designed specifically for African facial features tend to command premium prices, which limits accessibility for the majority of consumers. The high cost is often due to smaller production volumes, import costs, and a lack of local manufacturing capacity. This premium pricing conflicts with the affordability needs of the market.

Fragmented Retail Environments

The optical retail landscape in Africa is highly fragmented, ranging from sophisticated urban optical shops to basic rural dispensing services:

- **Diverse Retail Formats**: While urban centres may have modern optical shops, the majority of eyewear sales occur through informal or small-scale outlets such as mom-and-pop shops, kiosks, or rural clinics. This fragmentation complicates distribution and market penetration for specialized frame designs.
- **Distribution Challenges**: Serving a widely dispersed and fragmented retail base is costly and logistically complex. Small retail outlets often have limited cash flow and storage capacity, requiring intermediaries to break bulk and adding layers to the supply chain.
- **Supply Chain Visibility and Technology**: Limited visibility across the supply chain and the high cost of technology solutions hinder efficient distribution. Companies often rely on third-party logistics providers (3PLs) familiar with local customs and regulations, but last-mile delivery remains a challenge.
- **Market Entry Barriers**: The fragmentation and diversity of retail environments create significant barriers for new entrants and specialised product lines, requiring tailored distribution strategies and local partnerships.

Clinical Implications of Poor Frame Fit

The mismatch between available frame designs and African facial anthropometry creates several clinical challenges with direct impact on vision care outcomes:

Optical Misalignment

When frames do not properly align with the face, the optical centres of lenses may be displaced from the pupillary axis. Research by Moodley et al[2] demonstrated that a majority of the participants were found not to be looking through the optical centres of their lenses, compromising corrective outcomes.

Reduced Compliance

Discomfort from poorly fitting frames directly impacts wearer compliance.[2,38] Omolase and Mahmoud[39] found that among Nigerian patients prescribed spectacles, 28% of the participants reported non-compliance due to ill-fitting frames.

Vertex Distance Variations

Misfit frames—particularly those with poorly aligned nose bridges or temples—alter the vertex distance unpredictably. This is especially problematic for higher prescriptions, where optical performance is sensitive to this variable.[18]

Limited Options for Speciality Needs

Specific clinical needs, such as frames for children, sports eyewear, safety glasses, and low vision devices, are particularly underserved. Kumaran and Periakaruppan[40] expressed that in a majority of cases, spectacle frames for children are a reduced version of adult frames, lacking consideration for paediatric craniofacial dimensions and activity levels.

These clinical implications extend beyond mere discomfort, directly affecting the efficacy of vision correction and potentially compromising clinical outcomes in vision care programs.

Socio-Cultural Factors Affecting Eyewear Adoption

Beyond technical and clinical considerations, several socio-cultural factors influence eyewear adoption and preferences in African contexts:

Aesthetic Preferences

Cultural aesthetics and beauty standards influence frame style preferences. Research by Naude and Campbell[3] indicated that frame designs popular in Western markets often failed to align with local aesthetic preferences in multiple African countries, adding another dimension to design considerations beyond anatomical fit.

Stigma and Social Perception

In some communities, eyewear continues to carry social stigma or specific associations. In certain communities, spectacle wear was associated with ageing or disability, creating social barriers to adoption that compound technical fit issues.[41,42]

Gender Considerations

Gender roles and expectations influence eyewear preferences and adoption patterns. Research has found significant gender differences in frame style preferences and comfort priorities, with women more frequently reporting concerns about aesthetic impact and men more frequently prioritising durability.[41,43]

Traditional Healing Perspectives

In communities where traditional healing practices remain prominent, the adoption of corrective eyewear may interact with existing health belief systems. Understanding these interactions is essential for culturally appropriate design and distribution approaches.[44,45]

Climate Adaptations

Environmental factors including heat, humidity, and dust affect frame performance requirements. Some spectacle frame materials performing well in temperate climates may fail prematurely in tropical African environments, necessitating different material selection priorities.[46]

Addressing these socio-cultural dimensions alongside technical fit considerations represents a critical challenge for improving spectacle frame design for African consumers. Naude and Campbell[3] argue that these considerations should not be treated as peripheral but as foundational to creating equitable and contextually appropriate eyewear solutions.

Innovations and Solutions

Anthropometric Research and Databases

Recent efforts to address the gap in African anthropometric data include:

Digital Anthropometric Mapping

The use of 3D scanning technologies has significantly enhanced the precision and scale of facial anthropometry studies. Adekunle et al[47] determined normative facial anthropometry measurement among 452 Nigerians using a 3D stereo-photogrammetry analysis, which showed that there was a significant difference in the facial dimensions of males compared to females across all age groups included in the study.

Mobile Measurement Technologies

Innovations in smartphone-based anthropometric measurement tools show promise for expanding data collection capacity. Hartmann et al[48] validated a smartphone application capable of measuring key facial dimensions with accuracy comparable to traditional anthropometric tools, potentially enabling wider-scale data collection.

These research initiatives provide essential foundations for improved frame design, though significant gaps remain, particularly regarding systematic data collection across diverse African populations and age groups.

Frame Design Adaptations

Several design approaches have emerged to better accommodate African facial anthropometry:

Adjustable Bridge Systems

Innovative bridge designs including articulated, adjustable, and floating bridge systems allow for customization to different nasal bridge heights and widths. Thermoplastic materials like cellulose acetate allow heat-adjustable bridges to accommodate wider nasal measurements common in sub-Saharan populations.[46]

Modified Pad Arms and Positioning

Specialized pad arm geometries and positioning accommodate lower nasal bridge heights while maintaining frame stability. Replace traditional rigid pads with flexible silicone versions that conform to diverse nasal bridge heights and widths, reducing pressure points.[49]

Temple Design Modifications

Temples with adjusted length-to-curve ratios better accommodate head circumference variations. African populations show wider head widths, for example, Zimbabwean and Ghanaian males, when compared to their Asian averages of 136–140 mm, requiring temples up to 150 mm with graduated curvature.[11,27] The use of cable temples is also recommended; the curved riding bow designs prevent slippage in active wearers, particularly beneficial for rural populations engaged in physical labour.[49]

Frame Front Curvature Adaptations

Modified frame front curvatures better accommodate wider facial measurements.

Weight Distribution Engineering

Innovative approaches to frame weight distribution compensate for lower nasal bridge support.

These design adaptations demonstrate potential for improving frame fit for African wearers, though their availability remains limited in most markets.

Material Innovations

Novel materials offer potential solutions to specific challenges in frame fit for African populations:

- **Variable Flexibility Materials**: New polymer blends providing graduated flexibility allow frames to conform to diverse facial structures.
- **Climate-Appropriate Materials**: Materials engineered for performance in tropical climates address durability and comfort challenges.
- **Biocompatible Materials**: Advanced biocompatible materials reduce skin reactions and irritation, particularly important in humid climates.
- **Memory Materials**: Shape-memory alloys and polymers enable frames to maintain custom adjustments while providing flexibility. Research found that frames incorporating these materials required re-adjustment less frequently than conventional frames.[19,50]
- **Lightweight Composites**: Ultra-lightweight composite materials reduce pressure concerns related to lower nasal bridge support.

While promising, many of these material innovations remain at premium price points, limiting their accessibility in price-sensitive markets. However, they demonstrate pathways for addressing specific fit challenges through material selection and engineering.

Digital Manufacturing and Customization

Emerging digital technologies offer new approaches to frame customization:

- **3D Scanning and Printing**: Digital facial scanning paired with 3D printing enables truly customized frame production.
- **Parametric Design Systems**: Software utilizing parametric design principles allows semi-customization based on key measurements.
- **Virtual Try-On Technologies**: Advanced virtual try-on systems incorporate anthropometric analysis to recommend appropriate frame styles.
- **Mass Customization Approaches**: Modified Production Systems Enable Cost-Effective Customization at Scale.
- **Modular Frame Systems**: Component-based frames allowing interchange of bridges, temples, and fronts offer practical customisation options.

These technological approaches show particular promise for addressing the diversity of anthropometric needs within African populations, though implementation challenges, including equipment costs, technical training, and infrastructure requirements, remain significant barriers to widespread adoption.

Conclusion

This narrative review has examined the critical relationship between African facial anthropometry and spectacle frame design, revealing persistent challenges in providing appropriately fitting eyewear to diverse African populations. The literature clearly demonstrates that facial measurements common across various African populations often differ significantly from the European and East Asian standards that inform most commercial frame designs. These differences, particularly in nasal bridge structure, facial width, and orbital characteristics, create fundamental fit challenges affecting comfort, stability, and optical performance.

The implications extend beyond mere comfort, impacting clinical outcomes through reduced compliance, optical misalignment, and limited options for specialized needs. Socio-cultural dimensions further complicate eyewear adoption, with aesthetic preferences, social perceptions, and environmental factors influencing successful frame design and selection.

Emerging solutions offer promising directions for improvement. Expanded anthropometric research provides essential foundations for evidence-based design, while innovations in adjustable frame systems, appropriate materials, and digital customisation technologies demonstrate pathways to better-fitting eyewear. Case studies from various African contexts illustrate both successful approaches and implementation challenges in translating anthropometric knowledge into practical improvements.

Looking forward, priorities include expanded research representation across Africa's diverse populations, industry adaptation through broader size ranges and region-appropriate designs, clinical practice improvements through measurement protocols and fitting expertise, and technological innovation enabling greater customization and accessibility.

The development of spectacle frames truly appropriate for African facial anthropometry represents not merely a technical challenge but an essential component of equitable global eye care. As vision correction programs expand across Africa, addressing this fundamental aspect of appropriate eyewear becomes increasingly critical for sustainable impact. The evidence suggests that through combined efforts in research, design innovation, clinical practice, and technology development, significant improvements in spectacle frame fit for African populations are both possible and necessary.

Disclosure

The authors report no conflicts of interest in this work.

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