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Retinal nerve fibre layer thickness in Black South African children: A preliminary study

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Background: Spectral domain optical coherence tomography (SD-OCT) provides age-adjusted retinal nerve fibre layer (RNFL) thickness measurements, essential for diagnosing glaucoma. However, normative databases in these devices apply to individuals older than 18 years. The absence of a normative database for individuals younger than 18 years makes diagnosing glaucoma in this age group challenging.

Aim: To describe the average and quadrant RNFL thicknesses in children of Black ethnicity.

Settings: McCord Provincial Eye Hospital, Durban, South Africa.

Methods: A prospective, hospital-based study was conducted using a convenience sampling method. One clinically normal eye was selected from each child participant, aged 5–18 years. The RNFL thickness was measured using the iVue100™ SD-OCT device.

Results: Seventy-three children were enrolled in this study. The mean RNFL thickness was 107.32 ± 8.1 µm. The mean thickness of the inferior, superior, nasal and temporal quadrants was 135.1 ± 13.65 µm, 135.6 ± 14.59 µm, 83.2 ± 10.86 µm and 75.4 ± 9.03 µm, respectively. No statistically significant association was observed between the average RNFL thickness and variables such as age ($p = 0.438$), sex ($p = 0.106$), spherical equivalent ($p = 0.632$) or axial length ($p = 0.20$).

Conclusion: This study provides normative values for RNFL thickness in South African children of Black ethnicity and suggests potential ethnic variation. Further validation studies are required before these normative values can reliably be used in a clinical setting.

Contribution: This study addressed a gap in research on normative values for RNFL thickness in an under-represented paediatric population.

Keywords: normative values; normative database; retinal nerve fibre layer thickness; Black South African children; juvenile glaucoma; spectral domain optical coherence tomography.

Introduction

The African continent, the second largest and second most populous in the world, is home to 1.46 billion individuals representing diverse ethnic groups, with 41% of the population under the age of 15 years.[1] Globally, significant populations of African ancestry exist, with Brazil hosting the largest African diaspora, estimated at 55.9 million, followed by the United States, where 46.4 million individuals of African descent constitute 13.6% of the total population.[2] Despite this demographic significance, there remains a notable lack of research on establishing normative databases for retinal nerve fibre layer (RNFL) thickness within this population, particularly among paediatric groups.

The global prevalence of primary open-angle glaucoma is estimated at 68.56 million individuals. Significantly, a 20-year meta-analysis reported that Africa has the highest prevalence of the condition (4%) among all continents.[3] Of particular concern is juvenile open-angle glaucoma, a disease that is clinically and genetically heterogeneous with variations in age of onset, usually present in moderate-advanced stages. This subset of primary open-angle glaucoma can be diagnosed from age 4 up to 40 years. As it affects individuals younger, it can significantly impair vision and quality of life. The prevalence rates of juvenile glaucoma vary with different ethnic populations. In Nigeria, it was reported that juvenile glaucoma represented 3.4% of all newly diagnosed glaucoma cases in a tertiary care centre.[4] The prevalence rate remains unknown in South Africa. Notably, glaucoma accounted for approximately 6.7% of visual impairment in children attending schools for the blind in South Africa.[5]

Early diagnosis, timely intervention and consistent monitoring of affected individuals can prevent disease progression.[4] However, diagnosing glaucoma in children is challenging, as obtaining reliable measurements of visual fields and intraocular pressure requires understanding and cooperation from the patient, which is particularly difficult in younger children. Additionally, optic nerve head assessment is subjective among ophthalmologists, and differentiating physiological cupping from glaucomatous cupping can be problematic in certain cases.

Spectral domain optical coherence tomography (SD-OCT) is a non-invasive imaging modality that uses various scanning patterns to objectively quantify the thickness of the RNFL and has been reported to demonstrate high reproducibility in the paediatric population.[6,7,8] The thickness of the RNFL is measured as the distance from the internal limiting membrane to the outer edge of the RNFL.[6] Optical coherence tomography (OCT) is valuable in ophthalmology because it can characterise ocular tissues with near-histologic axial resolution, allowing for precise delineation and quantification of the thickness of various tissues essential to evaluating a wide range of diseases.[9]

The development of normative data specific to geographical and ethnic groups is essential for enhancing the accuracy of clinical risk stratification and prognostic evaluation in the screening, monitoring and management of glaucoma.[10] Currently, normative data for RNFL thickness for children under 18 years are absent in OCT devices. Consequently, baseline scans obtained during initial visits are frequently used as reference points to monitor progressive RNFL thinning.

The structural information obtained from OCT can also significantly increase confidence in diagnosing other optic neuropathies and maculopathies in children and may reduce the need for invasive tests.[9] It has been reported to assist in determining disease severity and visual prognosis; for example, optic neuritis can occur as part of a relapsing demyelinating syndrome (RDS) that includes conditions such as multiple sclerosis and aquaporin-4 antibody neuromyelitis optical spectral disorders. The long-term visual impairment is reported to correlate inversely with RNFL thickness in children with RDS.[11] An additional example includes paediatric neoplasms such as craniopharyngioma, pituitary adenoma and germ cell tumours. These tumours can compress the optic nerve and optic chiasm, leading to progressive thinning of the RNFL and loss of ganglion cells over time. This thinning can be detected through serial OCT measurements and may also have a role in predicting visual recovery.[9,12] Although OCT is not yet considered the standard of care for paediatric optic neuropathies, the utility of this device is emerging, highlighting the need for paediatric normative databases.[9]

No studies have investigated RNFL thickness in South African children of Black ethnicity. To date, the only available research in Africa was conducted in Kenya, focusing on retinal parameters in Kenyan and Bhutanese children.[13] While there have been limited reports on ethnic variations in RNFL thickness among children, studies in adults highlight this issue.[14,15,16] It would be important to consider ethnic variations in RNFL thickness in children, especially given the absence of a normative database in OCT devices.

Another concern is the underrepresentation of Black ethnic individuals in normative databases of commonly used OCT devices. It is important to note that individuals of Black ethnicity constitute 80.9% of our demographic in South Africa.[17] The iVue100™ SD-OCT normative database includes 10% (total normative database of 449 subjects) of individuals of African descent. Similarly, the Cirrus™ HD-OCT features an 18% representation of African Americans (total normative database of 282 subjects). In contrast, the Spectralis™ SD-OCT employs a normative database derived from European populations.[18,19,20]

Despite the reliance on these objective measurements based on adult normative databases, in evaluating and managing paediatric glaucoma, they may not accurately reflect the demographic variation in our population.

The objective of our study was to establish normative values for RNFL thickness using SD-OCT in South African children of Black ethnicity aged 5–18 years.

Research methods and design

A cross-sectional hospital-based study was conducted at McCord Provincial Eye Hospital (MPEH), Durban, South Africa, from September 2020 to July 2023. The study population comprised children of Black ethnicity aged 5–18 years. Patient recruitment began once ethical approval was obtained.

Participants were selected through a convenience sampling method, where eligible patients were consecutively included as they met the inclusion criteria. Informed consent for participation was obtained from the parent or legal guardian, who self-identified as being of Black ethnicity. Additionally, assent from the child was required, determined by their willingness to cooperate, with the child signing their name if capable.

Children were included if they met the following criteria:

- One normal eye (only one eye included for each child)
- Best corrected visual acuity of 6/9 or better
- Normal anterior and posterior segment
- Intraocular pressure < 21 mmHg
- Children with strabismus or mild allergic conjunctivitis (mild conjunctival injection or papillae and no corneal involvement) on topical olopatadine and intermittent use of fluorometholone 0.1% for acute flare-ups were included, as these were the common presenting problems of this age group at MPEH.

Children with the following conditions were excluded:

- Systemic medical disease
- Family history of glaucoma
- Previous intraocular surgery or laser
- Born less than 37 weeks postmenstrual age
- History of retinopathy of prematurity
- Previous trauma to the eye
- Chronic use of topical steroids
- IOP > 21 mmHg
- Vertical cup-to-disc ratio > 0.6 or suspicious glaucomatous cupping
- Cup-disc asymmetry of > 0.2
- Hypermetropia > + 3.00 D
- Myopia > –5.00 D
- Astigmatism > 2.00 D
- Axial length < 22 mm or > 25 mm
- Uncooperative children

Visual acuity was measured using a Snellen chart and converted to decimal notation. Intraocular pressure was measured with the iCare IC100™ tonometer (North Carolina, iCare US, Inc.). A slit-lamp examination of the anterior and posterior segments was performed on all patients by the investigator. Children with strabismus were required to have a cycloplegic refraction to exclude high hyperopia. All other children had an autorefraction (NIDEK ARK-1, NIDEK CO., LTD, Japan) or a subjective refraction by the optometrist. The spherical equivalent was calculated as the spherical power plus half of the cylindrical power value.

Axial length was measured using the ZEISS IOLMaster 500 (Carl Zeiss Meditech, Germany). Tropicamide 0.5% was used to dilate the pupil if the fundus examination was difficult. The RNFL thickness was measured using the iVue100™ SD-OCT (Optovue Inc, Fremont, CA, US, software version 2018.1.1.60) optic nerve head protocol. The child was asked to look at the green fixation cross in the machine, and the investigator observed and centred the aiming circle on the optic disc. The RNFL was measured along this circle of 3.45 mm diameter. A green highlighted Scan Quality Index (SQI > 27) indicated a good quality scan. The inferior, superior, nasal, temporal and average RNFL thickness were recorded. Our data collection sheet included an interviewer-administered questionnaire in the context of exclusion factors. All data were then transferred to a password-protected Excel spreadsheet.

A one-sample mean test was conducted to calculate the required sample size. With a power of 80%, we aim to determine whether the mean of our single sample differs from an estimated mean value in the paediatric population. A sample size of 73 would be required to estimate the RNFL with a margin error of 3 microns (medium effect size of 0.3). Three microns is the smallest measurable size by modern-day OCT devices (minimum axial resolution in tissue of 3 µm is claimed by Optopol® [Poland] for their new Revo® HR device). This estimation will have a 95% probability and is based on an estimated measurement of 99 ± 9 µm, using previous studies investigating the RNFL thickness in children as a guide.[7,21,22,23,24] Stata statistical software was used to calculate the sample size.

Statistical analysis was done using Jamovi® (The Jamovi Project, version 2.4, 2022) and R® (R Core Team, 2022). Analysis of variance (ANOVA) between groups was performed in all quadrants as well as average RNFL thicknesses. Descriptive statistics such as ranges, means and standard deviations were used to determine the main outcome parameters. A two-tailed Pearson bivariate correlation was used to determine the associations between RNFL thickness and risk profile parameters such as age, spherical equivalent and axial length. An independent samples t-test was used to associate categorical variables such as sex. All *P*-values were two-sided; a probability (*P*-value) < 0.05 was considered statistically significant.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of KwaZulu-Natal Biomedical Research Ethics Committee (BREC). The ethics approval number is BREC/00001374/2020. This study adhered to the tenets of the Declaration of Helsinki and good clinical practice.

Results

Seventy-three children were included in this study with the demographics and ocular parameters shown in Table 1.

The average RNFL thickness had a mean (standard deviation [s.d.]) of 107.32 µm (8.1). Mean (s.d.) quadrant values were as follows: inferiorly 135.1 µm (13.65), superiorly 135.6 µm (14.59), nasally 83.2 µm (10.86) and temporally 75.4 µm (9.03). There was no correlation with the average RNFL and age, sex, spherical equivalent and axial length, with a *P*-value of 0.438, 0.106, 0.632 and 0.20, respectively. This analysis may be underpowered to detect the desired effect because of an insufficient sample size.

Discussion

Our study reports an average (s.d.) RNFL thickness of 107.32 µm (8.1) in South African children of Black ethnicity, as measured using the iVue100™ SD-OCT. The average RNFL

TABLE 1: Demographics and ocular parameters (*N* = 73).

Parameters	Mean	s.d.	*n*	%	Range
Age (years)	10.1	2.8	-	-	5.0–18.0
Sex					
Female	-	-	35	47.9	-
Male	-	-	38	52.1	-
Visual acuity (decimal)	0.8	0.1	-	-	0.7–1.2
Intraocular pressure (mmHg)	14.5	2.5	-	-	9.0–18.0
Vertical cup-to-disc ratio	0.3	0.1	-	-	0.1–0.5
Spherical equivalent	+0.5	0.9	-	-	-2.2 – +2.8
Axial length (mm)	22.9	0.6	-	-	22.0–24.4
Left/right					
Left	-	-	35	47.9	-
Right	-	-	38	52.1	-

s.d., standard deviation.

thickness from the normative database for this device is 99.1 ± 9.5 µm, based on data from 458 individuals representing various ethnicities, with 46.9% of Caucasian descent and only 10% of African descent.[18] In comparison, the RNFL thickness in our sample measures higher than the average RNFL value reported by the normative database for the iVue100™ SD-OCT.[18] This observation has been reported in a study on South African adults of Black ethnicity by Ismail et al., who reported significantly thicker RNFL (108.7 µm) measurements than the European reference database (97.1 µm) for the Spectralis™ SD-OCT.[15]

A comparison of our findings with the study by Ismail et al. (Table 2) indicates a similar average RNFL thickness in children and adults of Black ethnicity (107.32 µm and 108.7 µm). However, we note the different OCT devices as a limitation. It may be possible that children of Black ethnicity also have a thicker RNFL compared to the European database for the Spectralis™ SD-OCT and would require further investigation.

Similarly, it is reported that South African adults of Black ethnicity have higher RNFL measurements than those observed in Black ethnic populations from other African countries, African Americans and various other ethnic groups, including individuals of Indian, Nepalese and Brazilian descent.[15,25] For example, the average RNFL thickness in a normal Ghanaian Black ethnic population is 102.37 µm, as measured using the Cirrus™ HD-OCT 500[26] and 104.17 µm in Nigerian adults, as measured using the Stratus™ OCT.[27] In comparison, the reported RNFL values of 108.7 µm (Spectralis™ SD-OCT) and 106.97 µm (iVue100™ SD-OCT) are higher in South African adults of Black ethnicity.[15,25]

In contrast, the RNFL thickness in African American adults (90.87 µm) was reported to be the thinnest among ethnic groups when compared to Latin American and Chinese American individuals, based on measurements obtained with the Cirrus™ HD-OCT 4000.[16]

The ethnic variability in RNFL thickness noted may possibly affect the early detection of glaucoma in Black ethnic populations, as a patient's results may reflect erroneously within the normal range specified by an OCT normative database and could be significantly thinner than those of individuals of the same ethnic group, in other words, had we compared to an ethnic-specific database.

Despite the higher prevalence of glaucoma and poorer visual outcomes in this ethnic population, there is a scarcity of studies establishing normative databases specific to African populations. For example, the prevalence of primary open-angle glaucoma in Ghana is 8.5%, the highest reported in Africa and second-highest globally. Similarly, African American adults face a significantly higher risk of developing glaucoma, with the prevalence of primary open-angle glaucoma being 4–5 times higher in Black ethnic groups compared to White ethnic individuals.[26,28]

We further compared our results to a similar South African study investigating the RNFL thickness in Black ethnic individuals aged 10–60 years (mean 28) with the same device, which allowed a feasible comparison (Table 3).[25] The mean average RNFL thickness was reported as 110.01 µm; however, an average RNFL value of 106.97 µm was recalculated by summating the reported quadrant values in the study. Both studies show similar average RNFL thicknesses (106.7 µm and 107.32 µm) with variations in the quadrant thickness. The limitations of this comparison would include sample size and differing age group representation.

In our study, we did not yield a significant correlation between the RNFL thickness and age, as in many paediatric studies, and this is likely because of sample size and study design.[21,22,23,29,30] However, in a population-based study by Chen et al., a significant negative correlation with age was reported in children, an analysis that was based on children aged 12–17 years.[31]

Age significantly influences RNFL thickness. Studies consistently show that RNFL thickness decreases with advancing age. This thinning is attributed to natural age-related loss of retinal ganglion cells and their axons. The rate of decline in RNFL thickness is typically around 0.2–0.5 microns per year, though this can vary based on individual factors.[32,33] This thinning is important in clinical assessments,

TABLE 2: Retinal nerve fibre layer in South African adults (Spectralis™) and children (iVue100™ SD-OCT).

Participants	South African adults[15]		South African children		*P*-value
	Mean	s.d.	Mean	s.d.	
Age mean (years)	41.3	12.50	10.10	2.80	< 0.001
RNFL thickness (µm)					
Inferior	139.65	23.80	135.10	13.65	0.135
Superior	142.50*	22.10	135.58	14.59	0.017
Nasal	77.70	14.60	83.21*	10.86	0.005
Temporal	74.80	10.30	75.41	9.03	0.672
Average	108.70	10.70	107.32	8.10	0.338

Source: Please see full reference list of this article https://doi.org/10.4102/aveh.v84i1.986

Note: South African adults (N = 132) range in years is 19–74; South African children (N = 73) range in years is 5–18.

*, statistically significant values.

RNFL, retinal nerve fibre layer; s.d., standard deviation.

TABLE 3: Retinal nerve fibre layer in South African adults and children (iVue100™ SD-OCT).

Participants	South African adults[25]		South African children		*P*-value
	Mean	s.d.	Mean	s.d.	
Age mean	28.13	13.09	10.10	2.80	< 0.001
RNFL thickness (µm)					
Inferior	135.06	9.66	135.10	13.65	0.975
Superior	131.96	10.46	135.58*	14.59	0.008
Nasal	87.24*	13.22	83.21	10.86	0.013
Temporal	73.63	15.66	75.41	9.03	0.342
Average	106.97	7.39	107.32	8.10	0.706

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Note: South African adults (N = 600) range in years is 10–60; South African children (N = 73) range in years is 5–18.

*, statistically significant values.

RNFL, retinal nerve fibre layer; s.d., standard deviation.

as age-related changes can be mistaken for or mask pathological conditions such as glaucoma. Therefore, normative age-adjusted data are essential when interpreting RNFL measurements in clinical practice.

In the African continent, studies focusing on normative values in children of Black ethnicity are limited. A Kenyan study examined the RNFL thickness in 128 Kenyan children and 130 Bhutanese children, finding no statistical difference between the two groups. The mean age (s.d.) was 6.4 years (1.5), and the average (s.d.) RNFL thickness in Kenyan children in the right eye was 108.1 µm (9.2) as measured with the iScan™ OCT device (Optovue Inc.).[13] The average RNFL thickness in Kenyan and South African children is observed to be similar, with measurements of 108.1 µm and 107.32 µm, respectively; however, it is important to note that an older-generation Optovue Inc. OCT device was used in the study. A comparison of the RNFL variation between South African children and those from other African countries could be insightful.

The variation of the RNFL with ethnicity highlighted by El-Dairi et al. revealed a thicker RNFL in children of Black ethnicity compared to a White ethnic group (110.7 µm versus 105.9 µm) from North Carolina as measured using the Stratus™ OCT-3.[14] We compared our results to a study by Kiziloglu et al., who also measured the RNFL with the iVue100™ SD-OCT (Table 4).[34] South African children of Black ethnicity had significantly thicker superior and inferior quadrants and average RNFL than this White ethnic paediatric population from Turkey. Although limited by sample size and study designs, these findings may suggest ethnic variation in children. Similarly, ethnic variation was reported in East Asian children who were reported to have a thicker RNFL measurement (105.45 µm and 107.92 µm in 6- and 12-year-olds, respectively) compared to children of European descent (101.95 µm and 104.57 µm).[35]

In contrast to our comparison to Turkish children, a comparison to a Chinese paediatric group showed a similar average RNFL with quadrant thickness variability (Table 5). This study by Chen et al. also measured the RNFL with the iVue100™ SD-OCT.[31]

Our study encountered challenges due to variation in study designs, sampling methods, and the OCT devices used in research on RNFL thickness in children. These differences make it difficult to draw accurate conclusions when comparing results across ethnic groups. Each OCT device has a different acquisition rate, resolution and RNFL detection algorithm and should not be used interchangeably. For example, the RNFL thickness is measured along a predefined circle diameter (usually between 3.4 mm and 3.5 mm) centred on the optic disc, and this diameter varies in OCT devices.[6] A systematic review of RNFL in children has highlighted the limitations of comparative studies; for example, high variability of inclusion criteria such as the range of visual acuity and refraction with cycloplegia. The average RNFL thickness ranged from 92 µm to 117.3 µm in this review, which included 74 studies of varying methodologies and OCT devices, and comparisons are not feasible.[36]

Examining the quadrant thickness, in our study, the superior and inferior quadrants were the thickest, with almost similar values (135.6 µm and 135.1 µm), followed by the nasal (83.2 µm) and temporal quadrant (75.4 µm). Our results followed the 'double hump pattern', which represents a normal pattern where the superior and inferior quadrants are thicker.[6] However, the thickness distribution did not follow the 'ISNT rule', where the inferior quadrant is the thickest, followed by the superior, nasal and temporal quadrants. There is variability in the average and quadrant RNFL thickness, even among normal children, and a deviation from this rule does not always infer pathology.[36]

A comparison to variables such as sex, axial length and spherical equivalent yielded no statistical significance in our sample. Since our study selected a normal range of axial length and a narrow range of refractive errors, we did not anticipate a correlation with RNFL thickness. It is important to note that axial length and refractive error are associated with RNFL thickness, hyperopic children tend to have a thicker RNFL, while myopic children show a thinner RNFL. Research indicates that the changes in RNFL thickness observed in myopic and hyperopic individuals are related to ocular magnification linked to axial length and refractive error. However, these differences in RNFL thickness

TABLE 4: Retinal nerve fibre layer in Turkish and South African children (iVue100™ SD-OCT).

Participants	Turkish children[34]		South African children		*P*-value
	Mean	s.d.	Mean	s.d.	
Age mean	10.40	3.40	10.10	2.80	0.500
RNFL thickness (µm)					
Inferior	130.60	14.20	135.10*	13.65	0.020
Superior	126.80	12.20	135.58*	14.59	< 0.001
Nasal	82.20	10.90	83.21	10.86	0.498
Temporal	76.20	8.20	75.41	9.03	0.493
Average	103.90	8.20	107.32*	8.10	0.002

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Note: Turkish children (N = 202) age range in years is 5–17; South African children (N = 73) range in years is 5–18.

*, statistically significant values.

RNFL, retinal nerve fibre layer; s.d., standard deviation.

TABLE 5: Retinal nerve fibre layer in Chinese and South African children (iVue100™ OCT).

Participants	Chinese children[31]		South African children		*P*-value
	Mean	s.d.	Mean	s.d.	
Age mean	12.82	3.11	10.10	2.80	< 0.001
RNFL thickness (µm)					
Inferior	129.23	20.30	135.10*	13.65	< 0.001
Superior	133.22	19.48	135.58	14.59	0.118
Nasal	77.10	14.89	83.21*	10.86	< 0.001
Temporal	93.58*	29.15	75.41	9.03	< 0.001
Average	106.89	12.84	107.32	8.10	0.776

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Note: Note: Chinese children (N = 4648) age range in years is 6–17; South African children (N = 73) range in years is 5–18.

*, statistically significant values.

RNFL, retinal nerve fibre layer; s.d., standard deviation.

diminish when the Littmann formula is applied.[37,38,39,40] To contribute more significantly to this field, conducting this study with a larger sample size is recommended, which includes a broader range of axial lengths and refractive errors.

Limitations

A small sample size, including participants from a single ethnic group, limited this study. Potential information bias, including self-reported ethnicity and medical history concerning exclusion criteria, should be acknowledged. Additionally, cycloplegic refraction was not performed on all participants, raising the possibility that cases of hyperopia may have been overlooked. Reche et al. reported no statistically significant differences in RNFL thickness in children with strabismus, suggesting a minimal impact on our results.[41] A study by Cingu et al. reported a thinner RNFL in children with vernal keratoconjunctivitis who had prolonged use of topical corticosteroid.[42] The direct impact of topical corticosteroids on RNFL thickness warrants further investigation. In this study, short-term use of fluorometholone 0.1% was not accounted for as a potential confounding factor. Additionally, the relationship between RNFL thickness and allergic conjunctivitis remains unexplored, with only a single study reporting a slightly thinner RNFL in Chinese children with allergic conjunctivitis.[43] The influence of optic nerve head parameters, such as disc size, on the RNFL thickness was not considered. Moreover, differences in study methodologies, OCT devices and software versions present challenges in the comparison of RNFL thickness across studies.

Recommendations

Our findings indicate that the average RNFL in our paediatric population is comparable to our adult cohort, with notable variations in quadrant-specific values. Both groups have the same ethnic background and were evaluated using identical OCT devices. Further research is essential to establish comprehensive normative databases for children and adults in the South African context, particularly within the predominantly Black ethnic population. Such studies should ideally be multicentric and adhere to uniform protocols to ensure data reliability.

Research in Africa remains under-represented because of resource limitations, financial constraints and systemic challenges. Clinicians in resource-limited environments must remain cognisant of the normative data embedded in their OCT devices. Since most OCT device manufacturers are based outside Africa, normative datasets for African populations are often lacking. This is particularly concerning given that individuals from these populations are at a higher risk for glaucoma. Manufacturers should consider incorporating paediatric and ethnic-specific normative databases and explore options for local data integration to enhance clinical accuracy. Since the number of publications is increasing for the utility of OCT devices, not limited to ophthalmology, we are hopeful that manufacturers will develop software and invest in paediatric databases.

Conclusion

This study presents normative values for the RNFL thickness in South African children of Black ethnicity and suggests potential ethnic variation. The development of paediatric-specific normative databases for OCT devices is essential for improving diagnostic accuracy in children with glaucoma and other optic neuropathies, enhancing clinical decision-making and public health outcomes. Ethnic-specific normative databases are necessary for paediatric and adult populations to ensure equitable representation across all ethnic groups, particularly those at higher risk. This would significantly enhance the clinical relevance of RNFL thickness assessments.

While the findings are promising, further research with larger and more diverse samples is needed to establish a comprehensive normative database in the paediatric population, which could ultimately aid in managing glaucoma and other optic nerve pathologies.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

N.G. was the principal investigator of this study and was responsible for designing the protocol, conducting the research and writing of the manuscript. S.O.B. was responsible for supervision and contributed to writing and editing of the protocol and manuscript.

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Data availability

The data that support the findings of this study are not openly available because of sensitive information and are

available from the corresponding author, N.G., upon reasonable request.

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