


# Scope of optometry practice in Trinidad and Tobago: A cross-sectional study

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## Abstract

**Background and Aim:** To report the scope of optometry practice in Trinidad and Tobago to identify areas that need improvement.

**Methods:** A cross-sectional study of optometrists in Trinidad and Tobago was conducted using a validated self-structured questionnaire. Data obtained was exported to the Statistical Package for Social Sciences. Descriptive analysis and Pearson  $\chi^2$  were used to summarize the demographic data and determine associations, respectively.

**Result:** A total of 63 optometrists participated in the study. Majority of them were females (69.8%,  $n = 44$ ), Christians (65.1%), East Indians (47.6%), and 30 years and below (66.7%). Most (87%) of them utilized routine optometric equipment in their clinical practice including autorefractors, retinoscopes, direct ophthalmoscopes, lensometers, phoropters, slit lamp biomicroscopes, trial lens boxes, and visual acuity chart projectors. A few of them have noncontact tonometer (4.8%), Volk lenses (1.6%), and perform color vision tests (1.6%). Fewer (12.7%,  $n = 8$ ) practitioners provided low-vision services. The use of pharmaceutical agents was prevalent among the participants (55.6%). Additionally, the provision of contact lenses was the most frequently practiced service among the participants (85.7%,  $n = 54$ ). A significant association was observed between the provision of low-vision services and sex ( $p = 0.03$ ).

**Conclusion:** The scope of optometry practice in Trinidad and Tobago is in accordance with the basic guidelines set out by the World Council of Optometry but there is need to get more involved in the provision of low vision and other specialty services.

## KEYWORDS

optometrist, practice, range of services, scope, Trinidad and Tobago

## 1 | INTRODUCTION

The practice of optometry has undergone significant changes in various countries, leading to transformations in practice patterns and the scope of services provided.<sup>1,2</sup> Advancements in education, practice, and technology have contributed to this evolution, expanding the role of optometrists.<sup>2,3</sup> Optometrists now fulfill not only the role of primary healthcare providers in detecting ocular problems but also specialize in areas such as contact lenses, low vision, and pediatrics, among others.<sup>4</sup> Furthermore, the integration of advanced diagnostic tools like the slit-lamp biomicroscope, retinal camera, and optical coherence tomography (OCT) have become common in enhancing the clinical services provided by optometrists.<sup>2,3</sup>

The practice of optometry varies across countries depending on the adopted curriculum. In the United States, optometrists are trained under the Doctor of Optometry program, while in the United Kingdom, it is a bachelor's degree program.<sup>5</sup> Most countries in Asia, Africa, Europe, and Oceania have adopted BSc optometry programs.<sup>4</sup>

The scope of optometry practice differs among countries, influenced by factors such as the level of training and the number of eye care practitioners available.<sup>5,6</sup> In Nigeria and Ghana, optometrists can prescribe and manage ocular diseases without passing a special exam, whereas in most European, Asian, and Oceanic countries, they are required to obtain a certificate in ocular therapeutics.<sup>4,5,7</sup>

To guide optometry practice globally, the World Council of Optometry (WCO) developed a competency-based model called the Scope of Practice in Optometry, which includes categories of services: Optical Technology Services, Visual Function Services, Ocular Diagnostic Services, and Ocular Therapeutic Services.<sup>8</sup> Optometry services encompass a range of areas, such as refractive, contact lens, low vision, binocular vision, and pediatrics services, although their availability may vary across countries.<sup>2,9</sup>

In Trinidad and Tobago (T&T), the optometry program started over 15 years ago at the BSc level. Before that, most optometrists in T&T received training abroad, including in the United Kingdom, South Africa, and Nigeria.<sup>10</sup> While there is existing information on the optometry training program in T&T, there is a lack of data on the range of optometry practice in the country. Therefore, conducting a study to explore the profile and range of optometry services in T&T is necessary. The findings from this study can inform the development of strategies to enhance eye care services in the country.

## 2 | MATERIALS AND METHOD

### 2.1 | Study design

The study employed a cross-sectional study design to assess the range of optometry practice in T&T.

### 2.1.1 | Study setting, population, and sampling

T&T is located in the South-eastern West Indies of the Caribbean geographically situated near South America, specifically northeast of Venezuela and northwest of Guyana, and is considered a high-income earning country.<sup>11</sup> It has a population of about 1.4 million mostly people of East Indian (40.3%) and African descent (39.6%), with about 18.4% of mixed race and 1.7% of other racial groups.<sup>12</sup>

In terms of optometry training, T&T has a single program offered at the University of the West Indies (UWI), Saint Augustine Campus, which was established in 2009.<sup>10</sup> The UWI Saint Augustine campus is one of the two institutions in the Caribbean offering optometry programs. UWI has produced over 200 optometrists who contribute significantly to the country's public and private healthcare sectors.<sup>10</sup> The Trinidad and Tobago Optometrists Association (TTOA) serves as the professional organization responsible for advancing the optometry profession and facilitating the coordination of optometrists' activities within T&T. Additionally, optometry practice is regulated by the Trinidad and Tobago Opticians Registration Council. During the time of the study, there were 116 registered optometrists in the country and a nonprobability sampling was used in this survey. All registered optometrists were eligible to participate in the study.

### 2.2 | Inclusion and exclusion criteria

The study included all registered optometrists practicing in the twin islands of T&T who provided their consent to participate.

### 2.3 | Data collection procedure

For data collection, a validated structured questionnaire was utilized, which was adapted from similar studies conducted in Ghana<sup>5</sup> and South Africa.<sup>13</sup> The questionnaire was modified based on the specific context of the study.

Before using the questionnaire for data collection, a pilot study was conducted involving 10 optometrists who were not part of the study area. Feedback and queries regarding the questionnaire were addressed, and necessary modifications were made accordingly.

To identify and reach out to all registered optometrists, contact information was obtained from the TTOA. Subsequently, the optometrists were contacted a month before data collection with information document explaining the aim of the study and importance of participating in the study. Consents were obtained 2 weeks from all those willing to participate in the study and Google link to access and complete the questionnaire was sent to them.

### 2.4 | Data analysis

After data collection, the collected data was exported to the Statistical Package for the Social Sciences software, v21 for analysis.

Descriptive analysis was done on demographic data while a Pearson  $\chi^2$  test was used to determine associations ( $p < 0.05$ ).

### 3 | RESULTS

#### 3.1 | Demographic characteristics of study participants

In this study, a total of 63 participants were included, with 44 of them being females, accounting for 69.8% of the total sample. The majority of the participants, constituting 66.7%, were aged 30 years and below. In terms of marital status, the largest group consisted of single participants, comprising 37 individuals, which accounted for 58.7% of the total sample. Regarding religious affiliation, Christianity was the most prevalent religion among the participants, with 65.1% identifying as Christians. Hinduism was the second most common religion, with 19.0% of the participants following it. In terms of ethnic background, the Indo-Trinidad group constituted the largest portion, making up 47.6% of the total sample. A statistically significant association was found between sex and religion ( $\chi^2 = 24.54$ ,  $df = 6$ ,  $p < 0.001$ ), indicating that there is a relationship between these two variables in the study population (Table 1).

**TABLE 1** Demographics according to sex.

Variables	Sex			Total	p Value
	Female	Male	Prefer not to say		
Age group					
30 years and below	28	13	1	42 (66.7)	0.628
31 years and above	16	5	0	21 (33.3)	
Marital status					
Single	24	12	1	37 (58.7)	0.323
Married	19	4	0	23 (36.5)	
Others	1	2	0	3 (4.8)	
Religion					
Christianity	29	12	0	41 (65.1)	<b>&lt;0.001</b>
Hinduism	10	2	0	12 (19.0)	
Islamic	5	2	0	7 (11.1)	
Others	0	2	1	3 (4.8)	
Ethnicity					
Indo-Trinidad	21	9	0	30 (47.6)	0.413
Mixed	11	5	1	17 (27.0)	
Afro-Trinidad	11	2	0	13 (20.6)	
Others	1	2	0	3 (4.8)	
Total	44 (69.8)	18 (28.6)	1 (1.6)	63 (100)	

Note: Bold values are statistically significant  $p < 0.05$ .

#### 3.2 | Distribution of ophthalmic equipment among participants

Figure 1 demonstrates that over 87% of the practitioners in the study utilized routine optometric equipment in their clinical practice. This included commonly used tools such as autorefractors, retinoscopes, direct ophthalmoscopes, lensometers, phoropters, slit lamp biomicroscopes, trial lens boxes, and visual acuity chart projectors. However, certain equipment (stereopsis/color vision) was less commonly available among the participants. Only 4.8% had access to a noncontact tonometer, while Volk lenses and color vision tests were available to only 1.6% of the practitioners.

#### 3.3 | Clinical practice among participants

The scope of clinical practice among the participants was found to be somewhat limited. Eight (12.7%) practitioners provided low-vision services, indicating that this area of optometry was less commonly practiced. The use of pharmaceutical agents was prevalent (55.6%) among the participants, indicating their frequent use in clinical practice. Additionally, the provision of contact lenses was the most frequently ( $n = 54$ , 85.7%) practiced service among the participants.

Furthermore, a significant association was observed between the provision of low-vision services and sex ( $\chi^2 = 6.99$ ,  $df = 2$ ,  $p = 0.03$ ), indicating that there may be gender-related differences in the provision of this particular service among the participants (Table 2). However, this finding is likely influenced by the small sample size and an already sex-biased study population.

### 3.4 | Distribution of clinical procedure

Regarding specific clinical practice variables, over 69% of the practitioners performed case history assessments, objective and subjective refraction, visual acuity testing, slit-lamp examinations, and contact lens assessments (Figure 2).

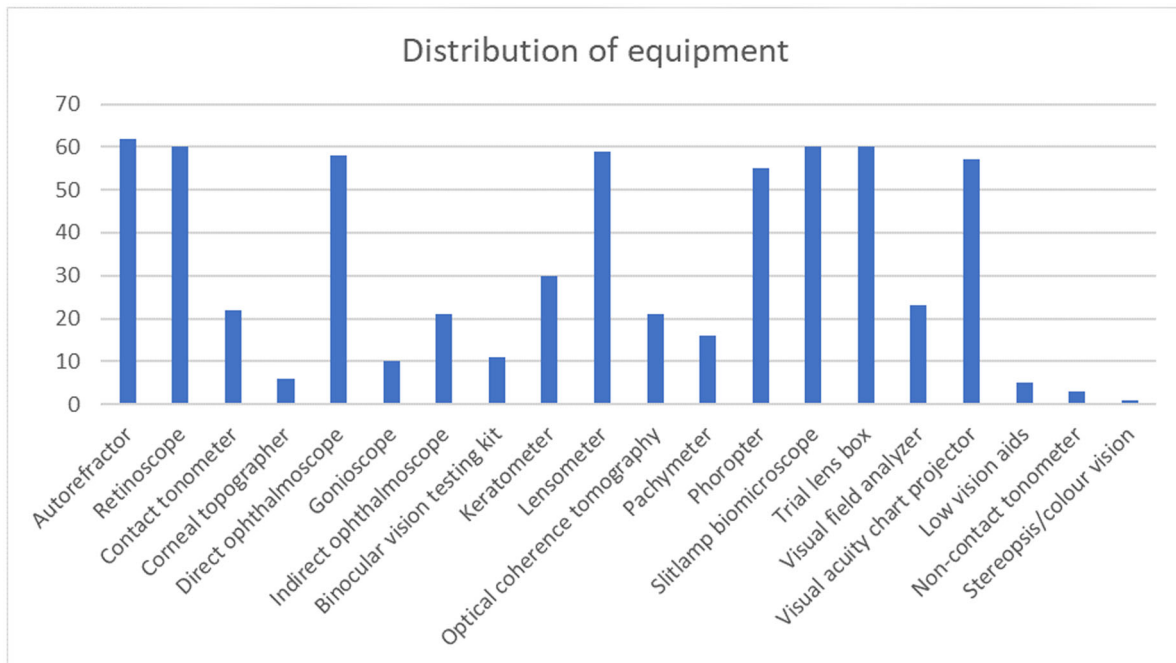
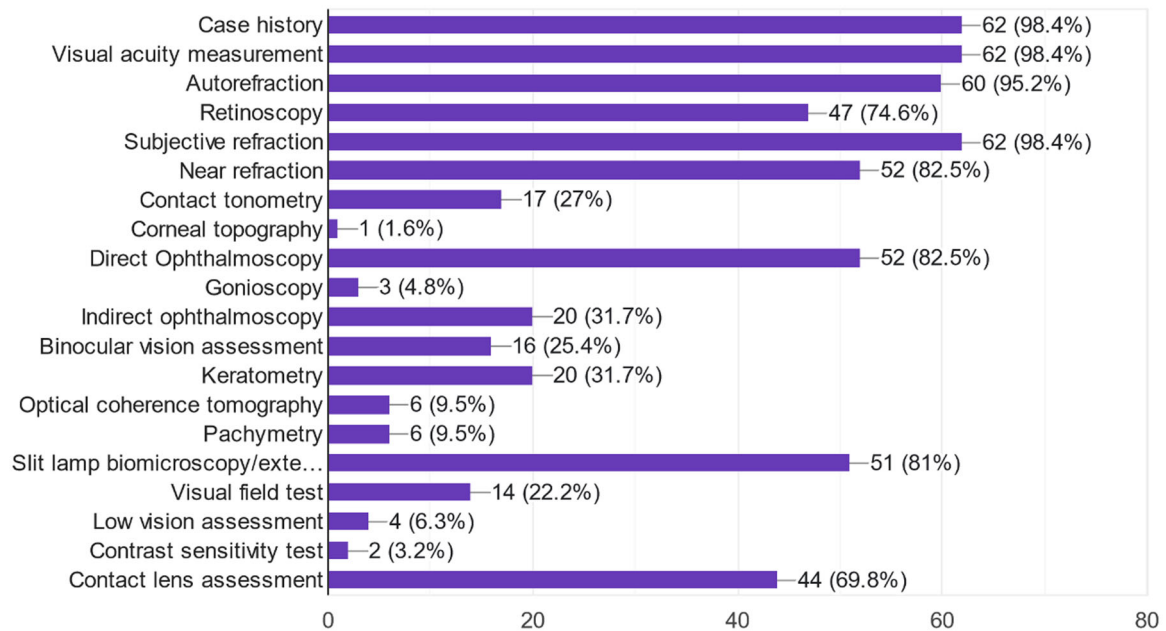


FIGURE 1 Distribution of ophthalmic equipment.

TABLE 2 Clinical practice among participants according to sex.

Variables	Sex			Total	p Value
	Female	Male	Prefer not to say		
Use of pharmaceutical agents					
Yes	25	9	1	35 (55.6)	0.591
No	19	9	0	28 (44.4)	
Provide low-vision service					
Yes	5	2	1	8 (12.7)	<b>0.030</b>
No	39	16	0	55 (87.3)	
Provide contact lenses					
Yes	36	17	1	54 (85.7)	0.400
No	8	1	0	9 (14.3)	
Provide pediatrics, binocular vision, and orthoptic services					
Yes	28	12	1	41 (65.1)	0.742
No	16	6	0	22 (34.9)	
Total	44 (69.8)	18 (28.6)	1 (1.6)	63 (100)	

Note: Bold value statistically significant  $p < 0.05$ .



**FIGURE 2** Distribution of clinical procedures.

### 3.5 | Workload and income of participants

Forty-four (69.8%) of the respondents reported attending to no more than 10 patients per day in their practice. Additionally, 48 (76.2%) had gross annual income of 200,000 TT\$ or less, indicating that their earnings were relatively modest. Since private practice was the dominant mode of practice among the respondents, 42 (66.7%) of them relied on various methods of advertisement to promote their services (Table 3).

### 3.6 | Distribution of mode of advertisement

Figure 3 illustrates that social media platforms and the distribution of pamphlets and flyers were the common modes of advertisement used by the participants. This suggests that optometrists in the study population leveraged social media platforms and physical promotional materials to reach out to potential patients and raise awareness about their practices.

### 3.7 | Association between workload and income

Table 4 shows the results of a  $\chi^2$  test analyzing the relationship between the number of patients attended to daily and the annual income of the participants. The test revealed a statistically significant relationship between these two variables, indicating that the number of patients attended to daily is associated with the annual income of the participants ( $\chi^2 = 10.08$ ,  $df = 2$ ,  $p = 0.006$ ).

On the other hand, no significant association was observed between the number of patients attended to per month and the annual income of the participants ( $\chi^2 = 2.90$ ,  $df = 2$ ,  $p = 0.234$ ). This suggests

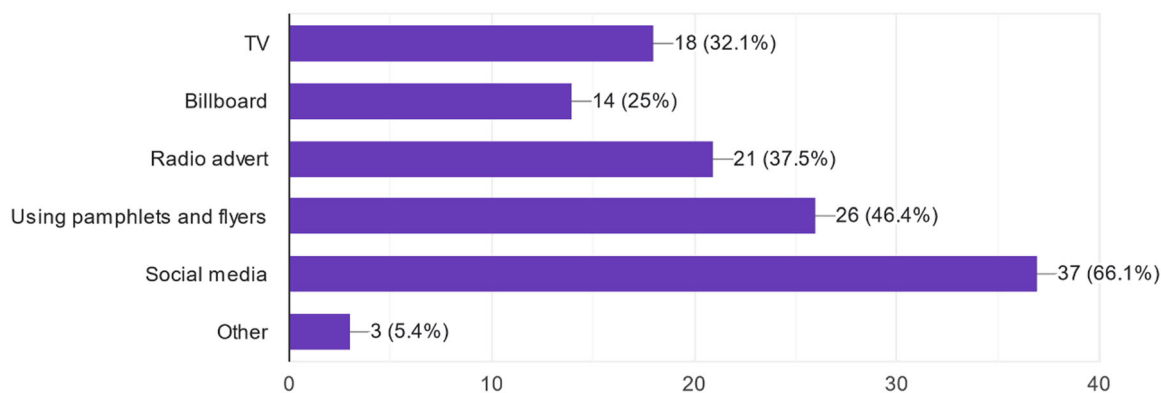
**TABLE 3** Workload and income of participants.

Variables	Frequency	Percentage
Number of patients per day		
10 or less	44	69.8
More than 10	19	30.2
Number of patients per month		
Less than 50	15	23.8
50 and above	48	76.2
Gross annual income		
Not indicated	2	3.2
200,000 or less	48	76.2
More than 200,000	13	20.6
Advertise service		
Yes	42	66.7
No	21	33.3
Total	63	100

that the monthly patient load does not have a significant impact on the annual income of the participants, according to the  $\chi^2$  test results.

## 4 | DISCUSSION

The scope of practice for optometrists is not standardized globally and can vary significantly from country to country. While certain core components of optometric practice, such as refraction and



**FIGURE 3** Distribution of mode of advertisement.

**TABLE 4** Association between workload and annual income.

Workload	Income			Total (%)	p Value
	Not indicated	≤200,000	>200,000		
<b>Patients/day</b>					
≤10	0	38	6	44 (69.8)	<b>0.006</b>
>10	2	10	7	19 (30.2)	
<b>Patients/month</b>					
≤50	1	35	12	48 (76.2)	0.234
>50	1	13	1	15 (23.8)	
Total	2 (3.2)	48 (76.2)	13 (20)	63 (100)	

Note: Bold value statistically significant  $p < 0.05$ .

funduscopy, are common across the world, other aspects of practice are regulated by country-specific optometric regulatory bodies. One area of variation in practice is the use of therapeutics and topical diagnostic drugs. The regulations regarding the use of these substances can differ among countries. Some countries allow optometrists to use therapeutics as part of their practice, while others may require optometrists to undergo additional certification courses or obtain specific qualifications to be authorized to use therapeutic drugs.

Research by Needle et al.<sup>14</sup> has highlighted the variations in the use of therapeutics among optometrists in different countries. This suggests that the extent to which optometrists are permitted to use therapeutic drugs is contingent on the regulations and policies established by the respective optometric governing bodies in each country. In some instances, optometrists may need to undergo additional training or certification beyond their basic optometric education to gain authorization for the use of therapeutics. The study by Bolland et al.<sup>15</sup> may provide insights into the specific certification requirements for optometrists in certain regions or countries.

Understanding the variations in the scope of practice for optometrists is crucial for both optometric professionals and patients. It ensures that optometrists are practicing within the legal and

regulatory frameworks of their respective countries and allows patients to receive appropriate and safe eye care services based on the qualifications and training of the optometrists in their region. In our study, it was observed that optometrists commonly used diagnostic pharmacological agents, such as anesthetics, mydriatic agents, and cycloplegics. However, there was no evidence of prescribing or using therapeutic drugs for the management of ocular pathology. Similar findings were reported in studies conducted in Portugal<sup>16</sup> and Singapore.<sup>17</sup>

In contrast, studies conducted in Ghana,<sup>5</sup> Australia,<sup>18,19</sup> and the United Kingdom<sup>14</sup> indicated that optometrists in those countries prescribed and used therapeutic drugs for managing ocular diseases. These variations in findings could be attributed to differences in the scope of optometry practice among countries. In countries like Australia,<sup>19</sup> Ghana,<sup>5</sup> and the United Kingdom,<sup>14</sup> prescribing and using therapeutic drugs is within the established scope of optometry practice. However, in T&T, it appears that this practice is currently beyond the scope of optometry practice. Therefore, it is recommended to review and revise the scope of optometry practice in T&T to include the use and management of ocular diseases with therapeutic drugs. This expansion of practice would help alleviate the burden on ophthalmologists in T&T,<sup>10</sup> who are already overwhelmed with multiple responsibilities in providing eye care services.

In T&T, despite the high prevalence of low vision,<sup>11,20</sup> our study revealed that only a few optometrists offer low-vision services. One possible explanation for this is that the majority of optometrists in T&T work in the private sector, where practices are profit-oriented. Consequently, the cost of low-vision services provided by these optometrists may be too expensive for the average low-vision patient to afford. Additionally, even the standard eye test cost may be prohibitively high for some low-vision patients. Therefore, the financial barrier prevents low-vision patients from accessing the services offered by these private practices, leading to a lower likelihood of optometrists providing low-vision services. While financial constraints are a significant factor, other barriers such as lack of space and inadequate training may also contribute to the limited provision of low-vision services by optometrists in T&T. Similar findings were reported in studies conducted in Ghana.<sup>5,21,22</sup>

To address these barriers, optometrists in private practices could consider forming partnerships with optical companies to provide low-vision aids and services at subsidized rates for low-vision patients. Additionally, continuous professional development programs organized by the optometry regulatory body in T&T, focusing on areas such as low vision, binocular vision assessment, orthoptics, and pediatrics, could help alleviate barriers such as inadequate training cited by some practitioners. By addressing financial constraints, improving training, and fostering partnerships, optometrists in T&T can enhance the availability and accessibility of low-vision services, ultimately improving the quality of care for low-vision patients.

In our study, we found that the most commonly performed procedures and available equipment among optometrists in T&T were in line with the guidelines set by the optometry regulatory body in T&T and the WCO.<sup>7</sup> Similar findings were reported in studies conducted in South Africa,<sup>13</sup> India,<sup>23</sup> and Ghana.<sup>5</sup> However, our study also revealed that certain diagnostic equipment, such as visual field analyzers, topographers, pachymeters, and OCT devices, were unavailable in most clinics. This finding is consistent with other studies conducted in Ghana<sup>5</sup> and South Africa.<sup>13</sup> The high cost of these equipment and the associated maintenance expenses may contribute to their limited availability in many clinics.

To address this issue, it is important for the optometry regulatory body in T&T to raise awareness about the significance of having such diagnostic equipment in optometric practices. These instruments play a crucial role in detecting ocular conditions such as glaucoma, keratoconus, and facilitating contact lens fitting. By highlighting their importance, the regulatory body can encourage clinics to invest in these essential diagnostic tools, improving the quality of eye care services provided by optometrists in T&T. Additionally, exploring potential strategies to reduce the cost of acquiring and maintaining such equipment, such as group purchasing or leasing options, may help make them more accessible to a greater number of optometric practices in T&T.

In contrast to a study conducted in Ghana,<sup>5</sup> our findings revealed that a significant number of optometrists in T&T actively advertise their services. This is likely due to the fact that the majority of optometrists in T&T are in private practice and rely on advertising to attract customers and generate profits. In government-owned facilities, where a mix of government-employed and private-employed optometrists may work, advertising may not be as prevalent or condoned. Similarly, a study conducted in South Africa<sup>13</sup> reported that optometrists in South Africa also advertise their services, with print media being the most common form of advertising. However, in our study, we found that social media was the most common means of advertising among optometrists in T&T. This shift toward social media advertising can be attributed to the increasing popularity and widespread use of social media platforms, where a large portion of the population consumes content.

The use of pamphlets and flyers as a means of attracting patients was also observed in our study, indicating that traditional print media still plays a role in eye care advertisements in T&T. However, there has been a significant surge in the use of electronic media,

particularly social media platforms, for advertising eye care services. This trend aligns with the increasing reliance on social media for consuming information and content. Overall, the findings suggest that optometrists in T&T are adapting their advertising strategies to reach a wider audience through digital platforms such as social media, while still recognizing the value of traditional print media. The shift toward social media advertising reflects the changing landscape of communication and marketing, where eye care service providers are leveraging these platforms to attract and engage with potential patients.

The concentration of optometrists in urban areas in T&T can indeed contribute to the average number of patients seen per day, as observed in our study. This finding aligns with the research conducted by Mashige and Naidoo,<sup>13</sup> who also reported similar results among optometrists in urban areas compared to those in rural areas. The higher population density and accessibility of urban areas likely result in a greater number of patients seeking optometric services.

Regarding the reported average income of optometrists in T&T, which falls within the range of 100–200K TT\$ annually, it indicates that optometry is a lucrative profession relative to the T&T minimum wage of 3000 TT\$ per month. Similar income findings have been recorded in other studies, such as those conducted by Boadi-Kusi et al.,<sup>5</sup> Carneiro and Jorgeet,<sup>16</sup> and Mashige and Naidoo.<sup>13</sup>

It is interesting to note the significant association found between annual income and daily workload but not with monthly workload. Although one might assume that the daily workload would accumulate into the monthly workload, the lack of association suggests that there may be different salary structures in place for optometrists. Some optometrists may be paid on a daily (hourly) basis (locum and part time), while others receive a fixed monthly salary. For those on a fixed monthly salary, their income is not influenced by the length of their working hours, whereas those paid hourly would have a direct correlation between workload and income. This discrepancy in salary structures could explain the observed dissociation between daily workload and monthly workload in terms of income. It is possible that the reported association in our study is primarily driven by the group of optometrists within our cohort who received their income on a daily basis.

Overall, these findings shed light on the distribution of optometrists, their income levels, and the relationship between workload and income in T&T. Understanding these factors can inform discussions and decision-making regarding salary structures, workload management, and the equitable distribution of optometric services in both urban and rural areas.

#### 4.1 | Strength and limitations

The study has limitations inherent to its quantitative nature, relying on self-reported data that may introduce response bias and limit the depth of understanding. Specific limitations include the lack of thorough investigation into the reasons for nonprovision of certain

services and the unavailability of diagnostic equipment. Nevertheless, the study is commendable as the first to report the scope of optometry practice in T&T, providing valuable insights into the current landscape. The small sample size is another limitation, reducing the representativeness and generalizability of the findings. To overcome these limitations, further research should explore specific areas of optometry practice and investigate the barriers and challenges faced by optometrists in T&T, leading to improved service delivery and informed decision-making.

## 5 | CONCLUSION

This study presents the first report on the profile and range of optometry practice in T&T. The findings indicate that a majority of optometrists in T&T are young females employed in private practices located in urban areas. They possess basic optometry equipment and provide services in line with the regulations set by the optometry regulatory body in T&T and the WCO. However, there is a need for increased involvement in the provision of low-vision services.

To address the disparities and inequities in eye care infrastructure, personnel, and services in T&T, it is recommended that stakeholders in eye care collaborate to develop comprehensive national eye care strategies. These strategies should aim to improve access to eye care, address gaps in low-vision services, and ensure equitable distribution of resources and personnel across different areas in T&T. By implementing these strategies, the overall quality and accessibility of eye care services in the country can be enhanced.

### AUTHOR CONTRIBUTIONS

**Ngozika E. Ezinne:** Conceptualization; data curation; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing—original draft; writing—review and editing. **Michael A. Kwarteng:** Data curation; formal analysis; investigation; methodology; software; validation; visualization; writing—original draft; writing—review and editing. **Selassie Tagoh:** Data curation; formal analysis; investigation; methodology; software; validation; visualization; writing—original draft; writing—review and editing. **Kingsley K. Ekemiri:** Data curation; investigation; methodology; validation; visualization; writing—original draft; writing—review and editing. **Grace Ogbonna:** Data curation; investigation; methodology; validation; visualization; writing—original draft; writing—review and editing.

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### CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

The data used to support the findings of this study are available from the corresponding author upon request. All authors have read and approved the final version of the manuscript.

### ETHICS STATEMENT

The study adhered to the Declaration of Helsinki and was approved by the Research Ethics Committee of the University of the West Indies, Saint Augustine Campus, Trinidad and Tobago (CREC-SA/0633/11/2020). Consents were obtained from all participants before data collection.

### TRANSPARENCY STATEMENT

The lead author Michael A. Kwarteng affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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