

RESEARCH PAPER

A cross-sectional survey of optometrists and optometric practices in Ghana

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Optometry has evolved over the years in many countries from being a craft to a health profession.^{1,2} In Ghana, it started with the formation of the Ghana Optical Association in 1964, when optometrists were referred to as ophthalmic opticians.^{3,4} They dealt solely in optical merchandise but now provide comprehensive eye-care services, being regulated by the Allied Health Professional Council (AHPC). Optometrist training started as a post-graduate diploma degree at the Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi. The post-graduate diploma was later replaced with the Bachelor of Science (Optometry) degree. In 2002, the University of Cape Coast (UCC) started the six-year Doctor of Optometry (OD) degree, which was adopted by the KNUST in 2004.⁴ The OD degree offers more comprehensive training for optometrists in the areas of ocular health assessments and management and the use of diagnostic and therapeutic agents and equips professionals with all the

Purpose: The study was conducted to profile optometrists and optometric practices in Ghana.

Methods: An online survey was conducted among 146 optometrists, who were registered with the Ghana Optometric Association (GOA). It included questions on their demographics, equipment, ophthalmic procedures routinely conducted and the barriers to providing a full scope of optometric services.

Results: Ninety registered optometrists (62 per cent) responded, their mean age being 28.97 ± 3.36 years. There were more males (68.9 per cent) than females and most had the Doctor of Optometry (OD) degree, the profession's highest degree in Ghana. There were more practitioners in urban centres (71.1 per cent) and most practices had basic optometric instruments, such as direct ophthalmoscopes, slitlamp biomicroscopes and retinoscopes. Many optometrists routinely conducted direct ophthalmoscopy (100 per cent), slitlamp biomicroscopy (87.5 per cent) and contact tonometry (55.7 per cent); however, few provided contact lens (10.2 per cent) and low vision (9.1 per cent) assessments, with 76 per cent stating that it was due to the unavailability of low vision devices, poor sources of contact lenses (27 per cent) and perceived insufficient training (11.2 per cent). Many practitioners (97 per cent) reported the use of diagnostic pharmaceutical agents and therapeutic pharmaceutical agents (96.6 per cent). Most practitioners (52.9 per cent) preferred conferences for the delivery of continuous professional development over publications (26.4 per cent) and internet resources (12.6 per cent).

Conclusion: The data elicited in this study provide a basis for addressing the country's unmet eye-care needs and can be used to determine training and support guidelines for the profession.

competency levels set out by the World Council of Optometry.^{5,6}

Human resources for the development of ocular health have been identified as one of the crucial steps toward achieving the VISION 2020: Right to Sight goals; however, the eye-care human resources to population ratios in developing countries, including Ghana, are woefully inadequate.^{7,8} Health-care delivery in Ghana comes under four main categories; public, private for profit, mission/non-governmental organisations and the traditional herbal system.^{9,10} Financing of public health care, including eye-care services, is operated under the national health insurance scheme (NHIS), which provides equitable access and financial coverage for basic health-care services for the population in Ghana. There are currently three cadres of health-care professionals that provide ophthalmic care for over 24.6 million Ghanaians, namely, ophthalmologists (78), optometrists (300) and ophthalmic nurses

(288).^{11–13} Ophthalmologists provide both surgical and medical services with the ophthalmic nurses assisting. Where there are no ophthalmologists, ophthalmic nurses focus mainly on the medical management of ocular disease. Optometrists offer primary eye-care services, such as refractive error correction, contact lens fitting, paediatric vision and binocular vision anomaly management, visual rehabilitation following non-treatable visual impairment and ocular disease diagnoses and management. Optometrists in Ghana are allowed to use diagnostic drugs and prescription of pharmaceutical agents to manage ocular conditions, such as conjunctivitis, dry eyes and glaucoma.^{5,6}

The prevalence of blindness in Ghana is estimated to be 1.0 to 1.7 per cent with the magnitude of visual impairment due to uncorrected refractive errors and other preventable eye disorders having been widely reported in the literature.^{14–16} Given the dearth of ophthalmologists in Ghana, the

optometrists' roles in meeting the country's eye-care needs could become the conduit to eliminating avoidable blindness. This is supported by the assertion that optometric referrals to other health-care providers constitute a major conduit for preventing blindness and other systemic health conditions.¹ In spite of the critical role that optometrists play in the eye-care sector in Ghana, there are currently no comprehensive data on the number of optometrists and the nature of their practices. To assist in addressing the problem of the country's unmet eye-care needs, this study was undertaken to profile optometrists and optometric practices in Ghana.

METHODS

Study design

A cross-sectional study of practitioners in Ghana was conducted from January 2014 to April 2014 using an online survey. A database containing the email addresses of all registered practitioners was obtained from the Ghana Optometric Association (GOA). All practising optometrists are required to be registered with the GOA, which co-ordinates the activities of the profession within the Allied Health Professional Council. All Optometrists who were registered with the GOA and had a valid email address were informed about the study. At the time of the study, there were 146 practitioners whose emails were in the GOA database and all of whom qualified to be part of this study. A link to the online survey was emailed to all registered practitioners, 90 of whom responded within the stipulated period of the survey, giving a response rate of 62 per cent.

A questionnaire was designed, based on a review of similar work in the literature¹⁷ and piloted among eight optometry interns in the Central region of Ghana. Questions that were not clear to the interns were reworded and presented a second time before the final design was approved. The questionnaire (Appendix 1) included questions on practitioners' demographics such as age, sex, highest level of education, university where they obtained their primary qualifications and location of practice. It included questions on ophthalmic equipment and procedures considered essential for successful optometric practice, as well as the barriers to providing optometric services, such as contact lenses and low vision care.

Data analysis

Data were analysed using the Statistical Package for the Social Sciences (IBM SPSS version 21) and the Chi squared test was used to test associations between variables. A two-tailed p-value of less than 0.05 was considered statistically significant. In addition, the descriptive data were analysed in terms of frequencies and percentages.

Ethical consideration

Approval to conduct the study was obtained from the Ethics Review Board, University of Cape Coast and GOA. Informed consent was obtained from all participants after reading an information sheet (preceded the questionnaire), which explained the study rationale and method. Once obtained, they were asked to complete the questionnaire.

RESULTS

Practitioners' profiles

Ninety practitioners (62 per cent) responded to the questionnaire and their mean age was 28.97 ± 3.36 years. The mean number of years that they have been in practice was 3.47 ± 2.89 years. There were more males (68.9 per cent) than females. Fifty-seven per cent of practitioners obtained their training at KNUST, while 42.2 per cent obtained their training at UCC. The majority of practitioners (91.1 per cent) had an OD degree and few (six

per cent) had post-graduate (Masters) degrees. In terms of category type (mode of practice), 51 per cent practised in public health facilities, while 49 per cent practised in private facilities. Most of the practitioners (71.1 per cent) practised in urban areas with the rest in rural areas. Most were employed by the government (76 per cent), while 24 per cent were in private practices. Practitioners were from all 10 regions of Ghana with the Greater Accra region (24.7 per cent), where the national capital, Accra, is located, having the highest representation. The Upper West region (1.1 per cent), located in the northern sector of the country and one of the poorest regions, had the lowest representation.

Equipment

Most practices were equipped with direct ophthalmoscopes (98.9 per cent), slitlamp biomicroscopes (88.8 per cent) and a few had corneal topographers (1.2 per cent) and low vision aids (8.0 per cent). Figure 1 shows the various equipment routinely used by the participating practitioners.

Clinical practice

The most routinely performed procedures were history taking (100 per cent), direct ophthalmoscopy (100 per cent), subjective refraction (100 per cent), visual acuity (98.9 per cent), slitlamp biomicroscopy (87.5 per cent) and retinoscopy (75.5 per cent). The least

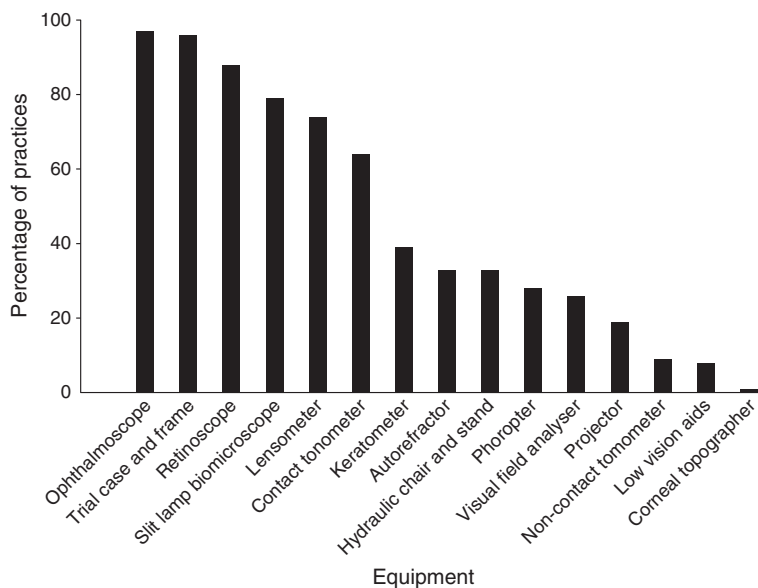


Figure 1. Distribution of available essential ophthalmic equipment among practices surveyed

performed procedures were contact lens (10.2 per cent) and low vision assessments (9.1 per cent) (Figure 2).

Therapeutics and diagnostics practices

Ninety-seven per cent reported using diagnostic pharmaceutical agents (DPAs) in their practices, with no difference in their use between those practising in public and private facilities ($\chi^2 = 1.16, p > 0.05$). Similarly, 96.6 per cent reported that they dispensed therapeutic pharmaceutical agents (TPAs) in their practices, with practitioners in both the public and private sector reporting similar patterns ($\chi^2 = 1.13, p > 0.05$). The majority of practitioners (65.6 per cent) practised in facilities that were accredited to provide the NHIS services. Optometric services in public facilities were more likely to be accredited than those in private practice ($\chi^2 = 50.09, p < 0.05$).

Business profile

Most practices (81.7 per cent) had an average patient base of less than 10,000 in a year, while a few (4.9 per cent) had a patient base greater than 30,000. The average number of new consultations for most practices (32.5 per cent) was between 51 and 100 in a month. The gross annual turnover of the majority of practices (45.8 per cent) was 50,000 Ghanaian Cedis (US\$17,000), while 8.5 per cent had a turnover greater than 200,000 Ghanaian Cedis (US\$67,000).

The majority of practices (61.9 per cent) reported not using any medium for advertising

their services. Of those who did advertise their practices, 17.9 per cent used electronic media, 13.1 per cent print media and 2.4 per cent used package deal offers.

Reasons for not providing low vision and contact lens services

Seventy-six per cent of practitioners reported unavailability of low vision devices as a major barrier to providing low vision services. Other barriers reported included perceived insufficient training (11.2 per cent), lack of motivation (6.7 per cent) and unavailability of space (4.5 per cent). A low interest of patients in contact lenses (44.8 per cent), poor source of supply of contact lenses (27.6 per cent), perceived insufficient training (19.5 per cent), lack of motivation for assessment and prescribing (4.6 per cent) and an unavailability of space (2.3 per cent) were reported as barriers to providing contact lens services.

Continuous professional development

Most practitioners (52.9 per cent) preferred conferences for continuous professional development (CPD) delivery. Other preferred methods were publications (26.4 per cent) and internet/online resources (12.6 per cent).

DISCUSSION

The results of the study show that most optometrists in Ghana are relatively young,

which could be due to the OD program being fairly new. The young age of practitioners in Ghana is comparable to similar surveys in other countries.^{1,18-20} This implies that they are likely to be in active service for many more years than in countries where they were generally older. The youthful vibrancy may be to the benefit of the Ghana Optometric Association in the area of advocacy and better working conditions for the profession.

The higher number of male practitioners is a reflection of the demographic characteristics of optometry students in Ghana, with fewer females enrolling in the programs due to science being a pre-requisite.²¹ Other reasons, such as family, child care and household responsibilities, may influence their decision to pursue a career in optometry.²² Efforts to narrow the gender difference in the number of practising optometrists have been made in a number of countries.¹⁸ For example, in New Zealand¹⁸ and Australia¹⁹ the gender distribution is fairly equal. Consequently, optometric training institutions in Ghana may have to increase quotas for females in their admission process. Practising female optometrists could also serve as role models to attract more females into the profession.

Most practitioners have the OD degree as their highest qualification, suggesting that an earlier upgrade program for practitioners with the post-graduate diploma appears to have been successful in standardising the qualification and the content of optometric practice in Ghana.⁴ A uniform basic OD qualification is vital for job grading and promotion in Ghana, which holds positive prospects for developing optometry in the country.

There were more optometric practices in urban than in rural areas, with most of those in the latter being public facilities. While government efforts to deploy more optometrists into district health facilities is a good development, a further integration of optometric practices into community-based health facilities, where refraction and basic eye examinations could be made available to the communities would be desirable and sustainable. Most private practices move away from rural communities for economic reasons, such as small patient base, with rural dwellers generally being of low socio-economic status and therefore, not able to pay for services. Accrediting most private optometric practices with the NHIS could be a motivating factor to establish satellite centres in rural communities, where they could make claims for services provided to the poor.

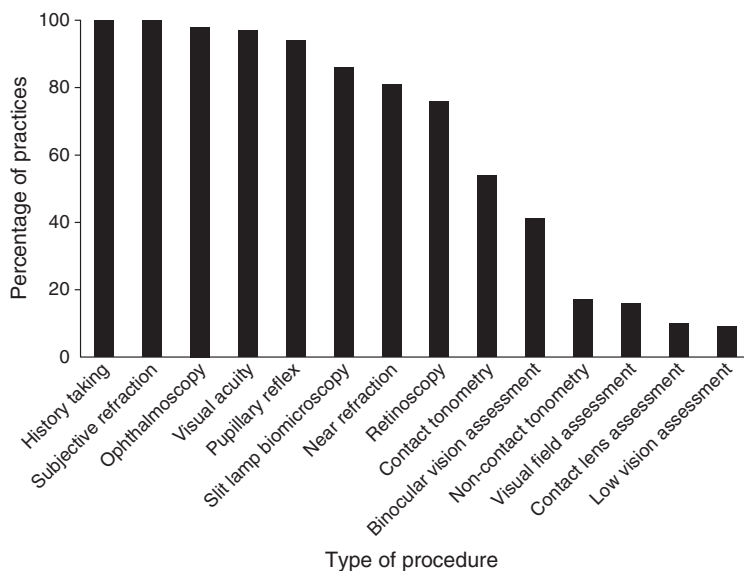


Figure 2. Types of ophthalmic procedures routinely performed among practices surveyed

Practitioners reported using different ophthalmic equipment in their practices, such as direct ophthalmoscopes and slitlamp biomicroscopes, which were available in most practices for ocular health assessments. This assessment forms part of OD training and positions the optometrist to provide not just the traditional refractive services but comprehensive primary eye care. As reported in the results, not many facilities had equipment such as the Humphrey visual field analyser and an optical coherence tomographer (OCT). As a result, patients are often referred to centres that have such facilities. The cost of these instruments may be a reason for their absence in these facilities. Moreover, a few reported the use of equipment, such as a phoropter for refraction and binocular vision procedures. Possible reasons for the limited number of phoropters, especially in public facilities, are that most public facilities are ophthalmology led, with the emphasis being on ocular health assessment, as against refraction and binocular vision procedures, which further reflects the weak integration of optometric services in the health-care system, an area that needs to be pursued in earnest to give patients the best possible care. Another possible reason could be the absence of residency/specialist units within both public and private facilities, which would necessitate acquiring such instruments. The lack of the use of instrumentation, such as indirect biomicroscopy, slitlamp funduscopy and gonioscopy and related equipment (for example, condensing lenses, gonioscope, binocular indirect ophthalmoscope) is of concern if Ghanaian optometrists are to play a vital role in comprehensive eye care. They would be required to enable optometrists, especially those in public facilities, to broaden the frontiers and practise the full scope of their profession.

The high reported use of direct ophthalmoscopy, slitlamp biomicroscopy and contact tonometry routinely used in ocular health assessment is consistent with the finding of Mashige and Naidoo¹⁷ in their study of optometric practices in South Africa. The high prevalence of some ocular health problems in Ghana, such as glaucoma and cataract,^{15,23} make it important for the optometric workforce to complement the few ophthalmologists, if they are to reduce the magnitude of these disorders. This is important, given that most practitioners apart from performing these procedures, are also able to use both diagnostic and therapeutic pharmaceutical agents in their routine practices, a finding

which contradicts earlier anecdotal reports that those in the public sector were not given the opportunity to prescribe therapeutic agents. While diagnostic agents include but are not limited to anaesthetics, mydriatic agents and cycloplegics, optometrists in the public health sector are limited to only agents from these groups, which are listed in the health insurance medicine lists. Additionally, under current regulations, optometrists are allowed to prescribe TPAs such as anti-glaucoma medications, antibiotics and anti-inflammatory agents. Examples of the drugs listed in the health insurance medicine lists include atropine 0.5 per cent, pilocarpine 2 per cent, acyclovir eye ointment 3 per cent, ciprofloxacin eye drop 0.3 per cent, dexamethasone eye drop and ointment, timolol maleate eye drops 0.5 per cent and methyl cellulose eye drops 0.3 per cent.²⁴

The traditional role of optometrists in both private and public health facilities in Ghana, is to provide refractive services, with the retinoscope and the autorefractor being the main equipment used to obtain results. All practitioners used the subjective refractive technique to obtain patients' refractive results. Data on national prevalence of uncorrected refractive errors in Ghana is lacking, with a study by Ntodie and colleagues²⁵ finding that refractive error services in some regions of Ghana were inadequate. While the expanded scope into ocular disease management is very important for the profession, it should be balanced against the critical area such as refraction.

Of the three ophthalmic cadres in Ghana (ophthalmologist, optometrist and ophthalmic nurse), it is the optometrist who receives in-depth training in contact lens and low vision assessments, yet few performed these examinations. Optometrists should be encouraged to routinely practise in these areas to offer quality services to the clients who need them. The unavailability of low vision aids and devices, such as contrast acuity charts, magnifiers and telescopes, as well as the perceived insufficient training, were reasons cited for not providing low-vision services in Ghana. This finding is comparable to other studies in India and Nigeria.^{26,27} The GOA could organise continuous professional development for optometrists to enhance their skills in low vision. Additionally, the optometric training schools may have to review their curriculum to cater for the needs of future optometrists in these areas. Private practices could form partnerships to procure low vision devices from major ophthalmic

companies. Additionally, major ophthalmic companies could take advantage of continuous professional development conferences to advertise their low-vision devices. Most practitioners reported that their patients' low interest in contact lenses and challenges in the supply were the major barriers to providing the service. This finding has implication for increased patient education on the benefits of contact lenses, as an alternative to spectacles.

Many practitioners preferred conferences as their method for CPD delivery rather than publication and internet resources, which may be important for the GOA to consider when planning CPD activities. Apart from gaining credit points for licence renewal by the Allied Health Professional Council, CPDs could help practitioners in Ghana to improve their skills in areas such as contact lenses and low vision and to gain confidence in new areas.²⁸ Possible limitations of this study are that it did not gather information on cycloplegics refraction and techniques associated with dilated fundus examination in the screening for ocular diseases, such as indirect biomicroscopy, slitlamp funduscopy and gonioscopy. Another limitation is that the current study was based on information from optometrists whose email addresses were on the GOA database, and a number of registered optometrists whose email addresses were not updated could have been missed.

CONCLUSION

This is the first survey to profile optometrists and optometric practices in Ghana and provides an indication of the current situation. The study showed that basic optometric instruments are generally available in many practices and that diagnostic and therapeutic pharmaceutical agents are widely used; however, certain optometric instrumentation (for example, corneal topographer, visual field analyser) and aspects such as contact lens and low vision need to be strengthened by the training institutions, practitioners and the GOA.

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