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SUBSPECIALIST EYE CARE SERVICES IN NIGERIA: CURRENT STATUS AND CHALLENGES
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ABSTRACT

Objective: **To determine the current status and challenges of subspecialty eye care service delivery in Nigeria**
Study Design: **Cross sectional descriptive study**
Setting: **Ophthalmological society of Nigeria (OSN) conference**
Subjects or participants: **Nigerian Ophthalmologists participating in the annual OSN conference.**
Interventions: **Data of current status of eye care services and challenges of subspecialty practice were collected using a pretested self-administered questionnaire. Chi-square test was used to determine associations at a P-value of 0.05**
Results: **There were a total of 136 respondents; 60 males and 76 females. Highest age range of respondents was 41-50years. About 44.1% had undergone some form of subspecialty training. The commonest area of specialization was Glaucoma (13.2%) while the least area was Neuro-ophthalmology (1.5%). There were more subspecialists in the western region of the country. The major constraint for undergoing subspecialty fellowship was lack of funds. The major barrier to setting up subspecialty practice on completion of training was Lack of equipment for subspecialty practice. Majority of the present subspecialists got international sponsorship for their subspecialty training while those without subspecialty training cited cost as a major impediment to training.**
Conclusion: **Subspecialty training and implementation is still developing in Nigeria. A major intervention has been put in place by CEHC, ICO and Fred Hollows foundation training some number of ophthalmologists. Subspecialty**

training should indeed be a continuum. Establishment of Regional subspecialist center's for training in different subspecialties and developing public- private partnerships for equipment provision with partnering hospitals and Federal government might help address these challenges.

INTRODUCTION

The history of subspecialty ophthalmology practice in Nigeria, dates back to 2005 when International Council of Ophthalmology (ICO) introduced the concept. This led to the creation of subspecialty interest groups by OSN. This developed into Subspecialty days and subsequently 'societies'. This gradual paradigm shift led to few self-sponsored short or long duration subspecialty trainings abroad as none was existent. The impact was minimal considering the nation's population and need. Several others who were willing to be trained were hindered by cost of training, lack of equipment etc.

Why subspecialty training? A total of 285 million people worldwide are visually impaired and 39 million are blind; 80% of blindness is preventable, where there is effective eye care management. Subspecialty training focuses a specialist to a specific area of practice thus ensuring mastery of skills and practice and excellent clinical outcomes (1). It also promotes advanced clinical research and discoveries which promotes better biomedical innovations, and scientific breakthroughs in the areas of practice. All these impact on better practice patterns and outcomes.

In developed countries like United States of America (USA), sub-specialization has been integrated into their training curriculum thus enabling all willing postgraduate fellows to have acquired subspecialty training by the end of their fellowship in well-equipped centres (2). This is made possible due to availability of trained manpower including resources for upgrading practice to current standards worldwide in addition to several donor collaborations for ongoing research in order to keep breaking new ground.

In the United Kingdom (UK), post graduate ophthalmology training involves 7 years of residency training with the year 7 spent in advanced subspecialty training as a trainee selected component. This may then be followed by a fellowship in a subspecialty with the curriculum now emphasizing outcomes of training rather than input or processes. This major change in training came as a result of the 'Calman Report' in 1996 which merged Registrar and Senior Registrar grades into the Specialist Registrar (SpR) training programme with a reduced training duration of 54 months (3).

Surgical training begins much later in Germany, with much greater emphasis on medical Ophthalmology (3). It is noteworthy that notwithstanding the short duration of training (three years) in the United States of America, they have a long tradition of leading the way with innovative techniques in the field. Perhaps, high expenditure on healthcare infrastructure, equipment and research within the framework of the more affluent American universities may be contributory (3).

A total of 90% of the world's visually impaired live in low- and middle-income countries (4) thus a greater need for subspecialization in these areas but the contrary situation is observed. Residency training in most instances does not make provision for subspecialty training. This is as result of lack of well-equipped centres, trained manpower and poor funding for continuing research (5,6).

Murthy reported in 2003 that ninety six percent of Indian colleges had no subspecialty fellowship programs (7). Only

7.6% had more than five international publications in three years in addition to poor infrastructure, poor library facilities, poor exposure to surgeries other than cataract (8).

In Nigeria, some ophthalmologists have embarked on subspecialty training on individual basis; sometimes self- sponsored, hospital -sponsored or sponsored by non-governmental organizations. However, these specialists have been few, grossly speaking compared to the entire population of ophthalmologists. Most go for three months training rather than full 1- or 2-year training; citing cost, challenge of being away from family as major barriers. The challenge of getting hands on training at subspecialty centres is also a major hindrance to mastery and transfer of surgical skills (2). Most centres in developed countries accept trainees for observership strictly. The willing centres for hands on training are few due to the need for the country's medical and ophthalmology board certification (2).

Thus, at the end of the day, assessment of extent of skill acquisition and impact of training on subspecialty development becomes an issue to be analyzed. The challenge of a cooperative hospital administration and enabling environment who is willing to provide necessary resources for starting, developing and sustaining subspecialty practice is another challenge. This, if addressed, will prevent ophthalmologists from loosing acquired skills when they return to their country.

However, despite these challenges encountered, there has been increased advocacy for sub-specialization. This has been championed by ICO in member countries (9). Presently with the support of ICO, Commonwealth eye health consortium (CEHC) and Fred Hollow's foundation, several people have been trained short term and long term. The training slots are not sufficient considering the number of ophthalmologists in the country; however, some have got the sponsorship and specialized. The ophthalmology faculty of West African college of surgeons has put in place a new curriculum incorporating subspecialty training into residency training effect from 2020. There is an ongoing assessment to determine capacity in terms of infrastructure/ equipment and the presence of adequate manpower. It is therefore needful to assess the current situation inorder to determine the number of subspecialists, their distribution as regards areas of sub-specialization and location of the subspecialists, the extent of their training, the type of training they offer and barriers to starting or establishing full subspecialty practice.

In Sub-Saharan Africa, the poser question resounds: where are we in subspecialty training? Where are we going? How do we get there? This will be the first assessment of the situation on ground in Nigeria where subspecialty development is still at its tender roots and will form a baseline for further planning and implementation of subspecialty training in Nigeria and other developing countries.

MATERIALS AND METHODS

A cross sectional survey of consenting Nigerian ophthalmologists was conducted using the membership database of Ophthalmological society of Nigeria during their annual conference using a self-administered questionnaire in English language. Information obtained included socio-demographic data comprising biodata, educational and professional background, and other demographics. The specific objectives of this study was to assess the number of fellows who have undergone subspecialty training in Nigeria; determine their areas of subspecialty training and duration of training; determine the type of training they had, determine the extent of subspecialist eye care delivery service they

are offering; identify barriers to the commencement of subspecialist eye care delivery service among those who are not practicing as subspecialists; identify reasons for not rendering full subspecialty service among those who are practicing but not rendering full service. This research was carried out following the principles of declaration of Helsinki. The data was analyzed using SPSS version 22 software. A *p*-value of less than 0.05 was considered statistically significant.

Ethical approval was given by the Health Research Ethics Committee of University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu. The study population were ophthalmologists attending the OSN annual congress.

This research was carried out following the principles of declaration of Helsinki. The data was analyzed using SPSS version 22 software. A *p*-value of less than 0.05 was considered statistically significant.

Study definitions: Subspecialty fellow/Subspecialist: A subspecialist is one who has undergone the subspecialty training for one year or more, uninterrupted and with hands-on and most of his practice back at home is in subspecialty area.

Subspecialty interest: An Ophthalmologist who has completed residency and has an interest in a particular subspecialty but has not undergone any formal training in it.

Study definitions

General/Comprehensive ophthalmologist: An Ophthalmologist who manages patients from all areas of ophthalmology and refers difficult subspecialty cases to trained subpsecialists

Hands-on training*:* Subspecialty training with practical skill transfer sessions on live patients

Observership experience: Subspecialty training without Hands-on training

RESULTS

A total of 136 respondents filled their questionnaires out of a total of 300 questionnaires, with a response rate of 45.33%.

Population distribution: The respondents comprised ophthalmologists from 30 out of the 36 states of the federation with the southwest and Lagos state in particular, having the highest population of ophthalmologists 29.4%. A total of 60 respondents had undergone some form of subspecialty training.

Table 1 gives the sociodemographic data of the respondents. There were more females in the study population, mostly in the range of 30 to 40 years and mostly residing in the western part of Nigeria.

Table 1

Sociodemographic characteristics of the respondents

Variable		**Frequency**	**Percentage**
	Sex		
	Male	60	44.1
	Female	76	55.9
Age group			
	30-40 years	54	39.7
	41-50 years	50	36.8
	51-60 *years*	32	23.5
Place of practice			
	South	12	8.8

	East	30	22.1
	West	68	50
	North	26	19.1

A total of 30 (50%) respondents had undergone subspecialty training and were aged between 41-50years. (P value 0.13). A total of 28 (46.7%) respondents who had subspecialty training were 6-10 years post fellowship. P value 0.08.

Table 2

Date of qualification with Subspecialty training

Variable		**Subspecialty training (N)**	
		Yes (%)	No (%)
Date of qualification	1-10 years	4 (6.7)	22 (28.9)
	11-20 years	28 (46.7)	36 (47.4)
	21-30 years	24 (40)	14 (18.4)
	31-40 years	4 (6.7)	4 (5.3)
Chi-square	7.21		
P value	0.066		

A total of 28(46.7%) respondents who had completed their subspecialty training were 11-20 years post fellowship P value 0.066

A total of 60 (44.1%) who had subspecialty training, 32(53.3%) had their post graduate fellowship in Ophthalmology in two colleges: the West African college of Surgeons and National Postgraduate Medical College (Ophthalmology) P.value 0.02. Out of 76 (55.9%) respondents who had no subspecialty training, 28 (36.8%) were ophthalmologists with the National college (FMCOph) while 20 (26.3%) had Other qualification (Diplomates).

Following the completion of subspecialty training, majority of the respondents 48 (80%) still maintained a combined practice while 4 (6.7%) maintained a strict subspecialty practice. P value 0.001.

Majority of the respondents 22 (55%) who had undergone subspecialty training spent 7 months to > 1 year before starting subspecialty practice after training. P value 0.28

A total of 58 (49.2%) respondents who had not undergone subspecialty training were not sure of their subspecialty of interest. Their practice mainly comprised general ophthalmology. However, amongst those with special interest in specific specialties but who had not undergone formal training, Glaucoma had the highest interest indication 18 (15.3%), followed by Vitreoretina 14 (11.9%) and Oculoplasty 10 (8.5%). P value 0.001

Table 3. Place of practice (geopolitical zone) with type of practice

A total of 36 (60%) of respondents who practiced general ophthalmology and 32 (42.1%) in combined ophthalmology practice were located in the western part of Nigeria, the zone with the highest population.

Table 3

Challenges and barriers of sub-specialty practice

Variable		Frequency	Percentage
Challenges of subspecialty			
	Lack of equipment	38	63.3
	Government involvement	2	3.3
	Lack of manpower	8	13.3
	Retraining and sponsorship	12	20
Ways to improve subspecialty Practice			
	Training	30	50
	Provision of equipment	28	46.7
	Funding	2	3.3
Reason for not practicing subspecialty after training	No instruments	16	80
	No supporting staff	4	20

The major barrier to subspecialty practice was lack of equipment (63.3%), Need for training and need for sponsorship (20%), lack of manpower to undergo training (13.3%) and Need for Government involvement and commitment to establishing functional subspecialty practice (3.3%).

Suggested ways to improve subspecialty training was majorly by training more ophthalmologists (50%), Procurement of equipment for practice (46.7%) and Providing funding for practice (3.3%). Reasons for not practicing in subspecialty after training include Lack of instruments/equipment (80%), no supporting staff (20%).

Table 4

Area and Duration of subspecialty

Variable		Frequency	Percentage
Area of subspecialty training			
	Not sure yet	58	42.6
	Community ophthalmology	4	2.9
	No interest	18	13.2
	Cornea	6	4.4
	Glaucoma	18	13.2
	Oculoplasty	10	7.4
	Neuro-ophthalmology	2	1.5
	Pediatric ophthalmology	6	4.4
Duration of subspecialty			
	Less than a month	4	6.7
	1-3 months	22	36.7
	4-6 months	6	10
	7 months ->1 year	18	46.7

DISCUSSION

Sub-specialization until most recently, has not been part of the training curriculum in Nigeria and indeed several African countries (10); despite the fact that it is part of the training curriculum in developed countries (11,12). In Nigeria, most Ophthalmologists who have subspecialized, had to undergo sub-specialization in other countries abroad through scholarships or self-sponsorship. Some others remain content with their basic ophthalmology training and continue to practice as general ophthalmologists.

Postgraduate training in the Faculty of Ophthalmology, according to the West African College of curriculum now comprises of first, the 3-year membership program; then the fellowship program which is purely subspecialty based (13). The first Membership examination started in 2020.

Interest in subspecialty training is growing (14). This has been supported by several international agencies and foundations such as International council of Ophthalmology, (ICO) Commonwealth eye health consortium, Fred hollows foundation among others (14,15,16). However, available training spaces are limited (15,16).

The older age group of post subspecialty Nigerian trainees may be alluded to the average duration of undergraduate medical training duration of 6 years, one year of horsemanship, one year of compulsory national youth service, residency training duration of 6 years minimum, challenges of time wasted before getting job placement. Interested persons also spend some years stabilizing in the profession before finding sponsorship opportunities for subspecialty training abroad for those interested. Thus, most subspecialists would have attained the age of 40 and above by the time their fellowship is concluded. However, younger subspecialty fellows are seen in America unlike Australia and Germany that spend more years in training (2).

The highest number of ophthalmologists interviewed with and without subspecialty training were 6-10 years post fellowship. This might have been as a result of younger post fellowship ophthalmologists being more willing to participate in the study.

Majority of the respondents who had completed their subspecialty training were 11-20 years post fellowship P value 0.066. This accounts for the time spent in securing sponsorship for fellowship, family concerns. Several Ophthalmologists who were more than 20 years post fellowship, had no interest in subspecialty training. Younger post fellowship ophthalmologists were yet to commence fellowship training.

About 53.3% who had subspecialty training, had their post graduate fellowship in Ophthalmology in two colleges: the west African college of Surgeons and National Postgraduate Medical College (Ophthalmology) P.value 0.02. Out of respondents who had no subspecialty training, 36.8% were ophthalmologists with FMCOph while 26.3% had Other qualification (Diplomates). The West African college of surgeons certificate is a common examination body that covers countries in west Africa while the National Postgraduate Medical College is the highest and only certifying examination body in Nigeria. The examinations are independent exams and a candidate has the option of choosing either or doing both. However, the advantage is that the National exam gives access to practice in Nigeria and occupy relevant positions in administrative and leadership structure of the college while that can be obtained for the participating west African countries with the west African certificate. Younger Nigerian Ophthalmologists opt for the two colleges while the older ones mostly have the West African college which is an older and the only existing exam body at their time.

Following the completion of subspecialty training, majority of the respondents still

maintained a combined practice P value 0.001. This involved running general ophthalmology clinics in addition to dedicated subspecialty clinics. Some combine subspecialty clinics with general ophthalmology clinics in the same clinic i.e. they see all patients in additions to subspecialty referrals on their clinic day. There has been a directive from the West African college to start dedicated subspecialty clinics in all centres; some centres are implementing this with the option of running additional general ophthalmology clinic on a different clinic day while several others are combining both. The advantage of maintaining and improving skills have been cited in favour of dedicated subspecialty practice but the patient load in some specialties are still low thus discouraging sole subspecialty practice in the meantime. However, the trend is headed in the direction of sole subspecialty practice in the near future as is the case in several academic centres in developed countries (17) and the training of more subspecialists (16,18).

In order of highest frequency, majority had 1-3 months subspecialty training (36.7%), followed by 7-10 months (26.7%) and ≥1-year training (20%). The short trainings (1-3 months) were mainly observership styled training while the 7-10 months and ≥1-year training were hands on (19).

Majority of the respondents (49.2%) who had not undergone subspecialty training were not sure of their subspecialty of interest. Their practice mainly comprised general ophthalmology (20,21). However, amongst those with special interest in specific specialties but who had not undergone formal training, Glaucoma had the highest interest indication (15,3%), followed by Vitreoretina (11.9%) and Oculoplasty (8.5%). P value 0.001. Subspecialty interest have been found to vary from country to country (17,18).

Majority of the respondents who practiced general or combined ophthalmology practice were located in the western part of Nigeria. However, this geopolitical zone has the highest number of ophthalmologists.

The major barrier to subspecialty practice was lack of equipment (63.3%); Need for training and need for sponsorship (20%), lack of manpower to undergo training (13.3%) and Need for Government involvement and commitment to establishing functional subspecialty practice (3.3%). There is need for sustainable economic structure to ensure that subspecialty training is sustained. The Malawi model has been cited which developed a cost-effective approach for expanding subspecialty training to ensure that trained subspecialists are retained in their home country (20). It may be reasonable to start developing subspecialty training centres in each specialist's home country. This reduces cost of training, family concerns of being away from family during the period of training, easier access to hands on training, and more opportunities for more people to be trained. There has been major collaborations with ICO, CEHC, Fred hollow's foundation and several people have trained in Nigeria. ICO and CEHC are now encouraging the establishment of regional subspecialty centres in Africa for sustained training of more subspecialists. Some centres have been identified and there are plans to start off training in the near future.

Suggested ways to improve subspecialty training was majorly by training more ophthalmologists (50%), Procurement of equipment for practice (46.7%) and providing funding for practice (3.3%). Poor infrastructure has been a major impediment to subspecialty practice in developing countries. The commitment of the Federal Ministry of health is solicited. Public private partnerships between hospitals and equipment manufacturers have also been

suggested. This is to ensure that every bottle neck is eliminated.

Reasons for not practicing in subspecialty after training include Lack of instruments/equipment (80%), no supporting staff (20%). There is need for training of supporting staff. Eye care is provided by a team and if training is not spread across all cadre, it will ultimately adversely affect the quality and sustainability of subspecialty service delivery. CEHC has trained some eyecare team comprising the Pediatric ophthalmologist, Pediatric optometrist, Pediatric ophthalmic clinic and theatre nurses. Oculoplasty eye care team comprising the Oculoplastic surgeon, the ocularist, oculoplasty theatre and clinic nurses have also been trained. The Glaucoma eye care team comprising the Glaucoma specialist, Glaucoma theatre and clinic nurses and Glaucoma counsellors have also been trained. These will comprise available manpower to train future eye care workers across its cadres.

Study limitations: The coverage for this study was not optimal as only consenting respondents were involved in the study.

The study is limited by recall bias of the respondents.

There is an ongoing accreditation visits to potential subspecialty training centres ahead of the commencement of subspecialty training in Nigeria in 2020. Details of available infrastructure and personnel from this accreditation visits will be domiciled at the West African College of Surgeons Secretariat

CONCLUSION

A considerable milestone has been attained in the development of subspecialty training in Nigeria with international support. The onus now lies on Nigerians to develop regional centres in their vicinity to ensure its sustainability, improve the involvement of government and non-governmental agencies in the provision of infrastructure and funding and ensure that learnt skills are transferred and sustained. There is need to start developing subspecialty practice and training within our locality thus making it more accessible and ensuring improved practice. This has been introduced in the training curriculum of the West African College of Surgeons in Ophthalmology but is still at its grassroots. Also, partnership with companies selling equipment might help ease the burden of its procurement. This will involve dedicated collaboration with hospital institutions and Federal government.

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