

Oral and Maxillofacial Surgery: Availability of Specialist Training and Different Training Pathways across Africa

Abstract

Background: Oral and maxillofacial surgery (OMFS) is the surgical specialty concerned with the treatment of a broad range of conditions that affect the head, face, mouth, neck, and jaw. In Africa, there is a paucity of information about the specialist training available to aspiring African Oral and Maxillofacial Surgeons. **Objective:** This paper aimed at shedding light on the available OMFS specialist training programmes and training pathways across Africa. **Materials and Methods:** The authors searched on PubMed, AJOL, and Google Scholar using the keywords “Africa,” “Oral and Maxillofacial Surgery,” “Residency,” “Postgraduate,” and “Education” and the individual African countries in English and official languages from inception till July 11, 2022. The authors utilised a questionnaire to interview native oral and maxillofacial surgeons and dentists in African countries where there were no published data on OMFS specialist training. **Results:** A total of 21 (38.8%) African countries had OMFS specialist training programmes ($n = 69$). The duration of training varies between 2 and 7 years. The number of training programmes per country ranges between one and thirteen. Countries with the most training programmes for OMFS in Africa are Nigeria, Egypt, Sudan, and Algeria. Northern Africa and Central Africa had the most and least numbers of specialist training programmes in OMFS, respectively. **Conclusion:** There remains a disparity in the number of specialist training programmes available to aspiring African Oral and Maxillofacial Surgeons as compared with other parts of the world. This paper is intended to function both as a means of advocacy to increase funding and resources in support of the infrastructure and development of facilities for African OMFS specialist training programmes and also serve as a valuable reference for future research in OMFS.

Keywords: Africa; education; fellowship; oral and maxillofacial surgery; postgraduate; residency

Introduction

Oral and maxillofacial surgery (OMFS) is considered a dental specialty in most African countries, and is one of the most sought after specialty by final year African dental students and intending residents.^[1-4] However, there are little published data about the available specialist training programmes and training pathways available in OMFS in Africa, as there is no document that gives a holistic view of the specialist training of African Oral and Maxillofacial Surgeons.^[5,6] Hence, this study aims to shed some light on the available OMFS specialist training programmes and the different training pathways across Africa.

Materials and Methods

The authors conducted a Google Scholar, AJOL, and PubMed search of the

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keywords “Africa,” “Oral and Maxillofacial Surgery,” “Residency,” “Postgraduate,” and “Education” from the database inception till July 11, 2022. The results were subsequently screened for relevance. Also to ensure that grey literature was not inadvertently missed, the authors conducted a hand search on Google using the same keywords as above but this time including the name of each African country. The search was conducted both in English and the official language of the African country. The results from the first and second searches were documented in an excel spread sheet. We included full-text articles (written in English or in the country’s official language) that could be validated by at least one native dentist or oral and maxillofacial surgeon. The native oral and maxillofacial surgeon and dentists were contacted via email and LinkedIn and were interviewed by means of a questionnaire. We excluded letters and editorials.

How to cite this article: Oyeyemi VO, Rais MA, Eguavoen GO, Abdalazez H, Osunronbi T. Oral and maxillofacial surgery: Availability of specialist training and different training pathways across Africa. *J West Afr Coll Surg* 2024;14:199-207.

Oyeyemi Victor Oyeyemi^{1,2},
Mohammed Amir Rais³,
Osamende Great Eguavoen⁴,
Alufa Oluwaferanmi⁵,
Hager Abdalazez⁶,
Temidayo Osunronbi⁷

¹Maxillofacial Surgery Section, Surgery Interest Group of Africa, ²Department of Dental Surgery, Ahmadu Bello University, Zaria, Nigeria, ³Faculty of Medicine, University of Algiers, Algiers, Algeria, ⁴School of Dentistry, University of Benin, Benin-City, Nigeria, ⁵Faculty of Dentistry, University of Ibadan, Ibadan, Nigeria, ⁶Faculty of Medicine, Alexandria University, Alexandria, Egypt, ⁷Neurosurgery Department, Royal Hallamshire Hospital, Sheffield, UK

Received: 01-Jun-2023

Accepted: 31-Jul-2023

Published: 22-Feb-2024

Address for correspondence:

Mr. Oyeyemi Victor Oyeyemi,
Department of Dental Surgery,
Ahmadu Bello University,
Zaria 810107, Nigeria.
E-mail: opeoyeyemi25@gmail.com

Access this article online

Website:

www.jwacs-jcoac.com

DOI: 10.4103/jwas.jwas_112_23

Quick Response Code:



Results

There are 54 countries in Africa but only 21 (38.8%) [Figure 1] of them have at least one OMFS specialist training programme. These 21 countries [Table 1] have a total of 69 OMFS training centres [Figure 2] with a mean OMFS specialist training programme availability of 3.28 ± 3.06 . Only 9.2% of African countries (Tunisia, Morocco, Algeria, Cote d'Ivoire, and Burkina Faso) consider OMFS a Medical Specialty.

Six out of seven North African countries have OMFS specialist training programmes: Egypt (seven centres), Libya (two), Algeria (six), Morocco (four), Tunisia (four), and Sudan (seven). Six out of 17 West African countries have OMFS specialist training programmes: Nigeria (thirteen centres), Senegal (one), Cote D'Ivoire (one), Burkina Faso (one), Mali (one), and Ghana (three).

Six out of 19 East African countries have OMFS specialist training programmes: Kenya (one centre), Uganda (one), Ethiopia (five), Tanzania (one), Zimbabwe (one), and Mozambique (two). In Central Africa, only two out of nine countries have OMFS specialist training programmes: Democratic Republic of Congo (one centre) and Angola (two). Of the four Southern African countries, South Africa (five programmes) is the only country with a specialist training programme in OMFS.

The most common duration of specialist training in maxillofacial surgery is 5 years (Democratic Republic of Congo, Algeria, Morocco, Ghana, Cote d'Ivoire, Zimbabwe, Tunisia, and Libya). Angola has the shortest period of specialist training (2 years) whereas Nigeria (6 years) and South Africa (7 years) have the longest periods of training.

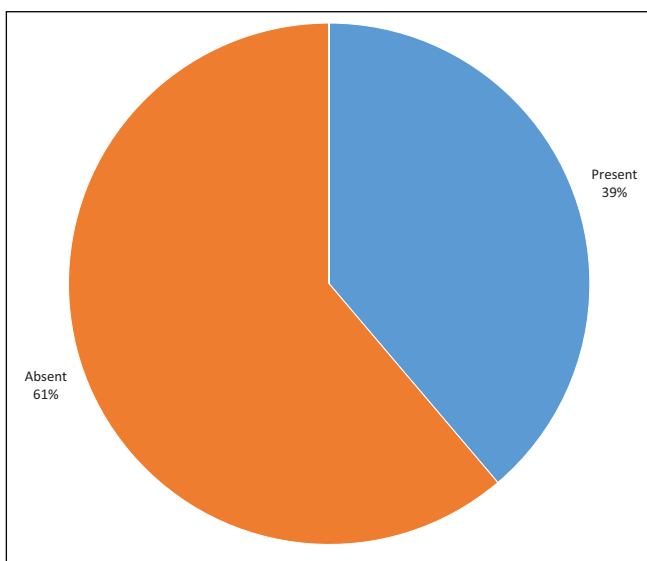


Figure 1: Percentage availability of oral and maxillofacial surgery training in Africa

Discussion

The African continent, consisting of 54 countries and a population exceeding 1 billion,^[7] faces significant healthcare challenges. Despite bearing 24% of the world's disease burden, Africa has the lowest density of the world's health workforce, accounting for a mere 3%.^[8,9] Consequently, the surgeon to population ratio in Africa stands at a meagre two surgeons per 100,000 individuals, with an even alarming ratio of one surgeon for every 2.5 million people in rural areas.^[10,11] The prevalence of tropical infectious diseases such as malaria, tuberculosis and HIV/AIDS has further exacerbated the situation, pushing surgically treatable diseases down the priority list of both governments and donor agencies.^[12] Furthermore, specialty areas, including OMFS suffer from an acute shortage of trained personnel, attributable to limited training centres and the emigration of skilled professionals to developed nations.^[13,14]

West Africa

There are 16 countries located in this region of Africa, six of which are Anglophone and ten are Francophone.^[15] However, only six of these countries [Table 1] offer specialist training in OMFS. The West African College of Surgeons (WACS) oversees specialist training and accreditation in this region alongside the National Postgraduate Medical College of Nigeria (NPMCN) and the Ghana College of Physicians and Surgeons (GCPS) for Nigerian and Ghanaian dental graduates respectively. It is imperative to state here that no francophone West African country is currently accredited by WACS to conduct postgraduate specialist training in OMFS.

However, Senegal, Mali, Burkina Faso, and Cote d'Ivoire offer national specialist training programmes in oral surgery that are not accredited by WACS. The Ivorian postgraduate specialist training is limited only to medical graduates,^[16] whereas that of the Senegalese is intended for qualified dentists.^[17] Both programmes grant the exit qualification, "Diplome d'etude Superieur" (DES) upon completion of training. Only the Cheikh Anta Diop Université de Dakar (UCAD) offers specialist training in oral surgery in Senegal and lasts a period of 4 years,^[17] while the Université Félix Houphouët-Boigny is the only training centre in Cote d'Ivoire. In Burkina Faso, the only institution where specialty training in Oral Surgery takes place is at the Université Joseph Ki-Zerbo, Ouagadougou and lasts for 4 years. In Mali, the only training centre for Oral Surgery is the Faculty of Medicine and Odontostomatology of the University of Sciences, Techniques and Technologies of Bamako.

To commence specialist training in Nigeria and Ghana, graduates of dental surgery (BDS/BChD) are required to pass the primaries of either the WACS^[18] or the National Postgraduate Medical College of Nigeria (NPMCN) in

Table 1: Summary of available maxillofacial surgery training programmes in Africa

Country	Region of Africa	Duration of training (years)	Entry requirements	Exit qualification
Egypt	North Africa	5–6	a. BDS (and MBBS in the case of Alexandria University) b. Internship c. Pass in Arab Board of Health Specializations examination or Egyptian Board Examination	Board certificate in oral and maxillofacial surgery M.Sc. PhD
Nigeria	West Africa	6	a. BDS b. 1 year internship c. 1 year NYSC (National Youth Service Corps) d. Full registration with the Medical and Dental Council of Nigeria (MDCN) as a dentist e. Pass in primaries or WACS and or NPMCN	Fellow of the Medical College in Dental Surgery (FMCDS)/Fellow of the West African College of Surgeons (FWACS)
Ethiopia	East Africa	4	a. DMD or DDS or equivalent b. Entry CGPA of 2.5 males c. Entry CGPA of 2.25 females d. Minimum of 2 years clinical service e. Oral and written entrance examinations	Specialty Certificate in Oral and Maxillofacial Surgery (Clinical MD, OMFS)
Congo DR	Central Africa	5	a. BDS b. Registration with the Order of Dentists	Specialist in Oral and Maxillofacial Surgery
Tanzania	East Africa	3	a. DDS or BDS b. Minimum entry GPA of 2.7	MDent (Oral and Maxillofacial Surgery)
South Africa	Southern Africa	4–7	a. bchD and or MBChB b. Registration with HPCSA as dentist c. 2 years internship experience d. Pass in ATLS e. PgDipDent (Oral Surgery) f. Pass in primaries	MDent/MChD/FCMFOS(SA)
Kenya	East Africa	4–5	a. BDS or equivalent b. Registered with the Kenya Medical Practitioners and Dentists' Board c. 1 year internship d. Minimum of 2 years work experience f. Entrance examination g. Proof of proficiency in English Language	Master of Dental Surgery in Oral and Maxillofacial Surgery
Uganda	East Africa	3	a. BDS b. 1 year internship c. Registered with Uganda Medical and Dental Practitioners Council or equivalent	Masters of Dentistry (Oral and Maxillofacial Surgery)
Algeria	North Africa	5	a. Docteur en Medicine (MD)	Diploma in Special Medical Studies (DEMS)/ Specialist in Maxillofacial Surgery

Table 1: Continued

Country	Region of Africa	Duration of training (years)	Entry requirements	Exit qualification
Sudan	North Africa	4–5	a. BDS b. 1 Year Vocational Training c. 1 year national service d. Age limit of 30 years e. Registration with Sudan Medical Council f. Obtain Pass in Selection examination and Interview g. 2 Referees of the Specialty	Clinical MD (Oral and Maxillofacial Surgery)/Specialist Certificate in Oral and Maxillofacial Surgery
Morocco	North Africa	5	a. Docteur en Medicine (MD)	Diploma in Special Medical Studies (DEMS)/Specialist Certificate in Oral and Maxillofacial Surgery
Angola	Central Africa	2	a. Bacharelem Cirurgia Odontológica	Data unavailable
Mozambique	East Africa	3	Bacharelem Cirurgia Odontológica b. 2–3 years work experience with the government c. Pass in Access to Medical residencies examination	Specialist certificate
Ghana	West Africa	5	a. BDS or BChD b. 1 year internship c. Registration in Professional Regulatory body	Fellow of the Ghana College of Physicians and Surgeons (FGCPS)/Fellow of the West African College of Surgeons (FWACS)
Cote D'Ivoire	West Africa	5	a. State Diploma of Doctor of Medicine	Diplome d'etude Superieur (DES) de Stomatologie et Chirurgie Maxillo-faciale
Burkina Faso	West Africa	4	a. Doctor of Medicine	Diplome d'etude Superieur (DES) de Stomatologie et Chirurgie Maxillo-faciale
Senegal	West Africa	4	a. Doctor of Dental Surgery or equivalent b. Pass in Entrance Test c. Interview or Assessment of Documents	Diplome d'etude Superieur (DES) de Stomatologie et Chirurgie Maxillo-faciale
Zimbabwe	Central Africa	5	a. BDS b. Dual Qualification (MBBS and BDS) c. At least 2 years Postgraduate Work Experience d. Pass in Oral Interview	M.Dent Dentistry (Oral and Maxillofacial Surgery)
Tunisia	North Africa	5	a. Docteur en Medicine (MD)	Diploma in Special Medical Studies (DEMS)/ Specialist in Maxillofacial Surgery
Mali	West Africa	Data unavailable	Data unavailable	Diplome d'etude Superieur (DES) de Stomatologie et Chirurgie Maxillo-faciale
Libya	North Africa	5	a. BDS b. Internship	Specialist Certificate in Oral and Maxillofacial Surgery

Nigeria^[19] or the Ghana College of Physicians and Surgeons (GCPS) in Ghana.^[20] At the end of the initial 3 years of training, those enrolled by WACS are required to sit the membership examination of the West African College of Surgeons (MWACS).^[18] Upon obtaining a pass in both the written and practical aspects of this examination, the trainee reserves the right to exit the programme with the award of MWACS qualification or continue further training as a senior registrar for another 3 years.^[18] After these

further 3 years have elapsed, the candidates are expected to sit the terminal examination (written examination, logbook grading and specialty viva) and also defend a dissertation topic to obtain the final exit qualification: Fellow of the West African College of Surgeons (FWACS).^[18] Upon satisfying examiners in all aspects of the programme, the fellows become appointable as consultants in the West African countries where their primary dental qualification have been registered.

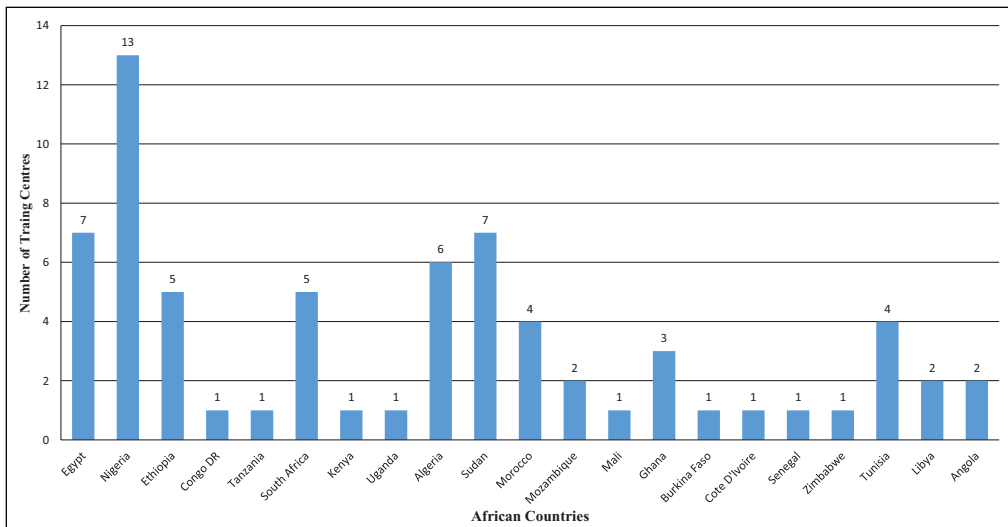


Figure 2: Distribution of oral and maxillofacial training centres in Africa by countries

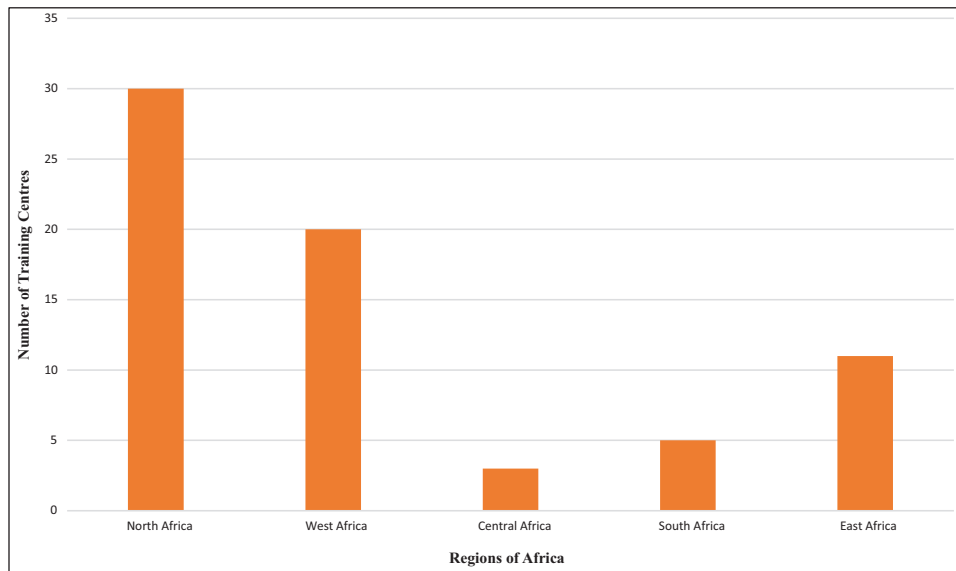


Figure 3: Distribution of oral and maxillofacial training centres in Africa by region

In addition, the trainee could sit the equivalent terminal examinations of the National Postgraduate Medical College of Nigeria (NPMCN) for Nigerians^[19] or the Ghana College of Physicians and Surgeons (GCPS) for Ghanaians.^[20] Where a candidate sits and passes the terminal examination of the sister colleges, they earn the right to place the designatory letters, Fellow of the Medical College in Dental Surgery (FMCDS) for Nigerians^[19] or Fellow of the Ghana College of Physicians and Surgeons (FGCPS) for Ghanaians after their names^[20] and can now be appointed as consultants in the country where the qualification was obtained. Also, the FMCDS of the NPMCN is recognised by licencing authorities such as the Dubai Health Authority, however, they can only be employed as specialists not consultants.

Southern Africa

The countries considered Southern African countries include: Botswana, Lesotho, South Africa and Namibia.^[15]

Only South Africa has specialist training programmes in OMFS [Table 1; Figures 2 and 3].

The major requirement needed to be considered for specialist training in maxillofacial surgery in South Africa is for the candidate to have qualified in medicine, dentistry or be dual qualified.^[21,22] Generally, to qualify as a maxillofacial surgeon in South Africa, a candidate can either choose to access specialist training through the universities offering the MChD (OMS) programme or through the Colleges of Medicine of South Africa, which grants the FCMFOS(SA) (Fellowship of the College of Maxillofacial and Oral Surgeons of South Africa) by obtaining a pass (50%) at the primaries examination of either of them.^[21]

At the end of the first 2 years of training in either programme, the candidates are required to sit and achieve at least a 50% pass at the intermediate examinations of either the MChD (OMS) or the FCMFOS (SA).^[21,22] Upon

completion of training, candidates are expected to sit for the final examination of the MChD (OMS) programme and or the FCMFOS (SA).^[21,22]

Where a candidate has satisfied examiners in an MChD (OMS) programme, they do not need to qualify in the FCMFOS(SA) examinations, as both qualifications yield equivalent privileges.^[22] Nevertheless, based on anecdotal evidence, some candidates still go on to earn the FCMFOS(SA) for the perceived reason that the FCMFOS(SA) is more prestigious than the MChD (OMS). Typically, candidates who have qualified only in dentistry spend a minimum of 7 years in training, candidates who have qualified only in medicine spend a minimum of 6 years in training, while dual qualified individuals are expected to spend a minimum of 4 years in training.^[22]

North Africa

There are seven countries in North Africa: Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, and Western Sahara.^[15] Of these countries, only Western Sahara has no specialist training in OMFS, with Algeria, Tunisia, and Morocco, regarding oral maxillofacial surgery as a medical specialty.^[23-25]

In Algeria, Tunisia, and Morocco, only candidates who have qualified in medicine are able to apply for specialist training in OMFS by means of a national “ranking exam.”^[23,26] Following 5 years of clinical training in OMFS which includes training in research, residents in Morocco, Algeria, and Tunisia must pass a final examination called the “End of Specialised Studies Exam.” Once passed, the resident is awarded both the title of Specialist in Maxillofacial Surgery and a license to practice.^[27]

Tunisia, Sudan, Egypt, and Libya are the four North African Countries that have accredited Oral and Maxillofacial Surgery training programmes recognised by the Arab Board of Health Specialisations (ABHS).^[28] In addition to the ABHS, Sudan and Egypt have national training programmes in OMFS.

In Sudan, the national body regulating specialist training in OMFS is the Council of Oral and Maxillofacial Surgery of the Sudanese Medical Specialisation Board (SMSB).^[29] Also, there are training institutions in Sudan that are jointly accredited by both the ABHS^[28] and the SMSB.^[29]

In Sudan, specialist training usually lasts 4 years with the SMSB^[29] and 5 years with the ABHS.^[28] The first year is for observation only at certified training centres where residents are not allowed to conduct interventions on patients. During the remaining years of specialist training, the residents are required to work under supervision at any of the accredited training centres and are also expected to provide teaching to undergraduate dental students. At the end of specialist training, the residents are expected to sit an exit examination which consists of four parts: thesis

discussion, written paper, clinical exam and Objective Structured Clinical Examination (OSCE). Upon satisfying the examiners, candidates are granted the exit qualification of Clinical MD (OMFS) by the SMSB or the Specialist Certificate of the ABHS.^[28]

In Egypt, the training and scope of practice of OMFS varies by region. In most regions of Egypt, OMFS is regarded a dental specialty except at Alexandria University where it is regarded a medical specialty.^[30] Maxillofacial surgery specialist training in Egypt comprises both academic work (MSc and PhD) and a clinical component.^[30] OMFS specialist training in Egypt is regulated by the ABHS,^[28] Egyptian Association of Oral and Maxillofacial Surgery (EAOMS) and the Egyptian Medical Syndicate (EMS). Specialist training usually lasts 5 years for candidates that have qualified only in dentistry. However, Alexandria University expects candidates to qualify in medicine and dentistry before entering into specialist training. Hence, in Alexandria University, persons who qualified in medicine have to study dentistry for 4 years before entering specialist training while dentists have to study medicine for 4 years before specialist training in OMFS.^[30]

East Africa

Nineteen nations constitute the eastern region of Africa.^[15] Ethiopia, Kenya, Mozambique, Tanzania, Uganda, and Zimbabwe are the only countries that have national specialist training programmes in OMFS [Table 1; Figures 2 and 3]. Although there is the College of Surgeons of East, Central and Southern Africa (COSECSA), a regional independent body that oversees and regulates training in surgical specialties, it has no accredited specialist training programme in OMFS in any of the countries located within the regions where it is recognised.

Qualifying as an oral and maxillofacial surgeon in Kenya takes between 4 and 5 years^[31] of specialist training at the only centre that provides OMFS training in Kenya; the University of Nairobi (UoN). In Kenya, to access specialist training in OMFS, candidates are expected to have qualified in dentistry and are expected to also obtain a pass at the entrance examination administered by the UoN. The specialist training curriculum at the UoN consists of both didactic lectures, guided demonstrations, tutorials and the residents are expected to complete a research dissertation.^[31] There is usually a two-year period following specialist training where candidates work as senior registrars under the supervision of a consultant before getting specialist recognition from the Kenyan Medical Board.

Specialist training in Ethiopia requires that a candidate possesses a dental degree, have spent a minimum of 2 years in government service and must obtain a pass at both the department of dentistry entrance examination and the University wide Graduate Admission Testing.^[32] Furthermore, to graduate, it is expected that a candidate

achieves a minimum CGPA of 3.0 at the end of the training programme in addition to passing the final written, practical and demonstration examinations and thesis defence. Where a candidate scores less than 70% total, they would be deemed to have failed and are allowed to repeat the examination only once after the initial attempt.^[33]

In Tanzania, only one institution, the Muhimbili University of Health and Allied Sciences, Dar es Salaam, offers specialist training in OMFS.^[34] The programme usually lasts for 3 years and has practical as well as research components embedded in the curriculum.^[34] Where a candidate satisfies the examiners in both the written and dissertation aspects of the final examination, the degree of Masters of Dentistry (OMFS) is awarded,^[34] and the candidates become appointable as specialists at hospitals within Tanzania.

Similar to Tanzania, only the University of Zimbabwe in Zimbabwe and the Makerere University in Uganda offer specialist training places in OMFS. The training programme at the University of Zimbabwe only recently began in 2022.^[35] Only candidates who have qualified in dentistry or are dual qualified can apply for specialist training in OMFS at the University of Zimbabwe. OMFS specialist training in Zimbabwe typically lasts 5 years.

To enter postgraduate training in OMFS in Uganda, a candidate must have qualified in dentistry, must have undergone a 1 year internship as a dentist and must be registered with the Ugandan Medical and Dental Practitioners Council.^[36] OMFS specialist training in Uganda takes place solely at the Mulago National Referral Hospital, the teaching hospital affiliated to the Makerere University.

In Mozambique, specialist training in OMFS usually lasts for a period of 3 years. Prior to entering specialist training in OMFS, candidates are expected to have qualified in dentistry. The only hospitals offering specialist training in maxillofacial surgery in Mozambique are the Central Hospital of Maputo (HCM) and the Central Hospital of Beira (HCB). Generally, in Mozambique, to secure a specialist training place, a candidate is expected to obtain a pass at the Access to Medical Residencies Examination proctored by the Order of Doctors of Mozambique.

Central Africa

There are nine countries in Central Africa: Angola, Cameroon, Central African Republic, Sao Tome and Principe, Congo, Equatorial Guinea, Congo DR, Gabon, and Chad.^[15] There is a severe lack of published information about specialist training in OMFS in this region of Africa. Only the Lusophone country of Angola and the Francophone country of the Democratic Republic of Congo have specialist training programmes in OMFS [Table 1; Figure 2], representing only 22% of the nations in this region of Africa.

In Angola, there is a lack of manpower for the oral health care workforce. Interestingly, eight institutions currently provide undergraduate dentistry training; however, it is worth noting that all of them are privately operated, with no public institutions offering this programme.^[37] Furthermore, it is worth noting that in Angola, OMFS stands as the sole domain of postgraduate dentistry in which certain public hospitals provide specialist training opportunities.^[37]

Specialising in OMFS in the Democratic Republic of Congo takes place only at the University of Kinshasa and requires that prospective candidates be qualified in dentistry and have registered with the Congolese order of Dentists.

Conclusion

There is a high disparity in the number of specialist training programmes available to aspiring oral and maxillofacial surgeons in Africa [Figure 3] as compared with other parts of the world such as the United States where in 2020, there was a total of 100 oral and maxillofacial specialist training programmes.^[38] This current state of OMFS specialist training in Africa can be chiefly attributed to the fact that OMFS is a relatively new surgical specialty, especially in Africa, and is not as developed or as recognised as some other surgical specialties like neurosurgery. The field of OMFS encompasses various subspecialties such as oncology, salivary gland conditions, trauma, facial deformities, cleft lip and palate surgery, aesthetic surgery, temporomandibular joint disorders, orofacial infections, and oral surgery, among others.^[39] Despite this wide range of surgical domains, trauma continues to be the predominant focus of OMFS practice in Africa.^[40-43] It is also important to note that the specialist training in oral surgery provided by several West African countries (Mali, Senegal, Burkina Faso, and Cote d'Ivoire), East African countries (Tanzania, Uganda, and Mozambique) and the Central African country of Angola are not considered equivalent to specialist training in OMFS. This distinction arises due to the primary focus of oral surgery on dentoalveolar procedures, trauma management, oral infections, benign salivary gland infections, and dental implants.^[44] Additionally, the duration of training for oral surgery is typically shorter compared to the extensive training undergone by oral and maxillofacial surgeons,^[45] where oral and maxillofacial surgeons are trained to handle more complex cases encompassing both oral surgery and broader craniofacial procedures.^[45] This paper not only establishes itself as a valuable future reference in the field of OMFS but also serves as a means of advocacy for fostering increased investment in African OMFS training programmes. By establishing more training centres, African countries can produce a larger number of qualified Oral and Maxillofacial Surgeons, leading to improved access to specialised healthcare services for their populations. This is particularly crucial in countries where there is a shortage of Oral and Maxillofacial Surgeons.

Acknowledgements

Our sincerest thanks go to the following persons for their fundamental support in the area of validating information and providing resources to aid the writing of this research paper: Dr. Wayne Manana (Zimbabwe), Dr. Mushunje Susan (Zimbabwe), Dr. Matlaba Machaka (South Africa), Dr. Bahiya Hamad (Sudan), Dr. Kemer Kedir (Ethiopia), Dr. Robert Mandela (Kenya), Dr. Julius Nyang'ombe (Tanzania), Mr. Kalogeye Lebanon (Tanzania), Dr. Manuela Domingos Madede (Mozambique), Association of Dental Surgeons of Burkina Faso, Dr. Mahmoud Samy (Egypt), Dr. Kimutai Alvin (Kenya).

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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