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Assessment of Ear, Nose, and Throat (ENT) Services in Tertiary Hospitals of N'Djamena: Human Resources, Technical Equipment, Clinical Practices, and Quality Indicators

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Abstract

Background: Otorhinolaryngological conditions represent a major public health burden in sub-Saharan Africa, where the shortage of specialists remains critical. In Chad, N'Djamena concentrates virtually all national ENT resources; yet no comprehensive assessment of its tertiary-level services has been conducted to date. **Objective:** To provide an exhaustive description of ENT services in N'Djamena's tertiary hospitals with respect to human resources, technical equipment, task-delegation practices, continuing medical education, infection control, and quality indicators. **Methods:** A multicentre descriptive cross-sectional survey was conducted from 13 to 20 April 2026 in all six tertiary hospitals of N'Djamena with an identifiable ENT service (participation rate: 100%). A structured 80-item questionnaire was administered to department heads, and a composite quality improvement score (0 - 12 points) was calculated for each service. **Results:** The six departments collectively employed 10 ENT physicians (including two expatriates), with no certified audiologists or speech-language

pathologists. Task delegation to allied health staff was universal but rarely governed by written protocols. Basic consultation equipment was broadly available; however, audiological functional investigation was virtually absent (speech audiometry, tympanometry, otoacoustic emissions, auditory evoked potentials: 0/6). Specialised surgery (tympanoplasty, functional endoscopic sinus surgery, mastoidectomy) remained highly limited. Thirty-four medical evacuations abroad were recorded over twelve months. No department had a formalised continuing education programme or accreditation. Quality scores ranged from 4 to 11 out of 12. **Conclusion:** ENT services in N'Djamena's tertiary hospitals exhibit heterogeneous and constrained capacities, hampered by specialist shortages, a critical deficit in functional audiological investigation, and insufficient quality governance. Simultaneous strengthening of human competencies, technical infrastructure, and quality mechanisms is essential.

Keywords

Otorhinolaryngology, Tertiary Hospitals, N'Djamena, Human Resources, Quality Indicators

1. Introduction

Otorhinolaryngological diseases represent a major public health burden in sub-Saharan Africa. According to the World Health Organization (WHO), approximately 40 million people in the African region live with hearing loss, a figure projected to reach 54 million by 2030 in the absence of urgent intervention [1]. More than 56% of African countries have only one ENT specialist per million inhabitants [1]—a density dramatically below the global average of 2.19 ENT practitioners per 100,000 population recorded in high-income countries [2]. The first pan-African survey of ENT services, conducted in 2009 by Fagan and Jacobs, revealed an alarming shortage of specialist services and called for a coordinated continental response [3]. Its replication in 2015 by Mulwafu *et al.* concluded that progress over the intervening decade had been woefully insufficient: although the number of ENT surgeons had increased by 43% in responding countries, this growth was entirely offset by demographic expansion [4]. More recently, a ten-year scoping review of ENT services in Southern Africa (2014-2024) confirmed the persistence of the same deficiencies—shortage of qualified personnel, inadequate infrastructure and equipment, and the absence of telemedicine and community audiology strategies [2].

These general observations are of particular resonance in Chad. N'Djamena, the capital and sole national referral center, concentrates virtually all of the country's ENT specialists. Yet a recent study conducted in district hospitals of the capital revealed a severe deficit in basic diagnostic resources: 71.3% of practitioners relied on improvised lighting, only 26.1% had access to an otoscope, and more than one-third performed no complete ENT clinical examination [5]. The referral system for ENT conditions within these peripheral facilities was similarly dysfunc-

tional [6]. Recent epidemiological data further attest to the reality of the local disease burden: otalgia accounted for 22.3% of ENT outpatient visits at the Renaissance University Hospital Center, and the in-hospital prevalence of chronic suppurative otitis media was 6.1% [7] [8].

While these studies document conditions at the peripheral and epidemiological levels, no work has hitherto provided a comprehensive assessment of ENT services in N'Djamena's tertiary hospitals—institutions that nonetheless constitute the apex of the national health pyramid and the last resort for patients from across the entire territory. The present study aims to fill this documentary gap by providing, for the first time, a complete situational analysis of N'Djamena's tertiary ENT services—encompassing human resources, technical equipment, task-delegation practices, medical evacuations, continuing education, infection control, patient satisfaction, and quality indicators—with a view to informing a structured national policy for the improvement of ENT care quality in Chad.

2. Materials and Methods

2.1. Study Design and Setting

This was a multicentre descriptive cross-sectional study conducted in all tertiary hospitals of N'Djamena that housed an identifiable ENT department, unit, or outpatient clinic at the time of the survey. Data collection took place from 13 to 20 April 2026.

2.2. Study Population and Eligibility Criteria

The target population comprised all ENT departments and units within N'Djamena's tertiary hospitals (university teaching hospitals, general reference hospitals, and specialised reference hospitals). The statistical unit was the ENT department, with one questionnaire per department. Respondents were either the head of the ENT department or unit, or, in their absence, the most senior ENT physician on staff.

Inclusion Criteria: Tertiary-level hospital located in N'Djamena; Department or unit providing an identifiable ENT activity at the time of the survey; Informed consent of the respondent.

Exclusion Criteria: Departments closed or having ceased ENT activity at the time of the survey; Questionnaires with incomplete data on the primary variables of interest (staffing levels and technical equipment).

2.3. Sampling

The study was exhaustive in design: all ENT departments in N'Djamena's tertiary hospitals were approached and participated. Facilities were identified from the official register of the Ministry of Public Health and Prevention. The six institutions were: 1) National Reference University Hospital Center (NRUHC); 2) Renaissance University Hospital Center (RUHC); 3) University Hospital Center of Chad-China Friendship (UHCCCF); 4) University Hospital Center for

Mother and Child (UHCMC); 5) Military Instruction Hospital (MIH); 6) Hospital of Refoundation (HR).

2.4. Data Collection Instrument

A structured 80-item questionnaire was developed, covering: hospital identification; human resources; task delegation; consultation, functional investigation, and surgical equipment; medical evacuations abroad; continuing education; patient safety and infection control; patient satisfaction; and quality indicators and clinical audits. The questionnaire was administered face-to-face or by telephone by the principal investigator. It was developed de novo by the research team on the basis of a structured literature review, the WHO Service Availability and Readiness Assessment (SARA) framework, and the ENT-specific service survey instruments of Fagan & Jacobs (2009) and Mulwafu *et al.* (2017) [3] [4]. It was reviewed for content validity by two public health experts not affiliated with the study before being piloted in one department (excluded from the final analytical sample) prior to the main data collection phase.

2.5. Composite Quality Improvement Score

A composite quality improvement score (0 - 12 points) was constructed from six dimensions, each rated from 0 to 2: 1) Human resources and mode of practice; 2) Consultation equipment; 3) Functional investigation; 4) Effective surgical capacity; 5) Continuing education; 6) Infection control and quality. Services were classified into three levels: low (0 - 4 points), intermediate (5 - 8 points), and advanced (9 - 12 points). This score was constructed de novo, as no validated tool specifically designed for the assessment of ENT service availability in low-resource settings was identified in the literature. Its construction was guided by the WHO Service Availability and Readiness Assessment (SARA) framework. Equal weighting across the six dimensions rests on the premise that each represents a structurally independent domain whose deficiency alone may be rate-limiting for quality of care. Each dimension receives a holistic score of 0, 1, or 2, and not one point per equipment category.

2.6. Statistical Analysis

Data were entered and analysed using SPSS version 26. Categorical variables were expressed as frequencies and percentages; continuous variables as mean ± standard deviation, or as median with range.

2.7. Ethical Considerations

This study dealt exclusively with aggregate, anonymised organisational data at the departmental level; it involved no patient data collection, no clinical intervention, and no identifiable risk to participants. In accordance with the requirements of the national ethics committee for this type of survey, administrative authorisations were obtained from the Ministry of Public Health and Prevention and from the administrations of all six participating hospitals. Participation was voluntary,

respondent anonymity was guaranteed, and all data were handled confidentially.

3. Results

3.1. General Characteristics of the Included Departments

Six ENT departments distributed across six distinct tertiary hospitals were included (participation rate: 6/6, 100%). Four institutions were university hospital centers, one a military instruction hospital, and one a general reference hospital (Table 1). The age of the ENT services ranged from less than one year (HR, established in 2026) to 33 years (NRUHC, established in 1993), with a median year of establishment of 2017.

Table 1. General characteristics of the six tertiary ENT departments in N'Djamena (2026).

Hospital	Year of Establishment	Survey Respondent
National Reference University Hospital Center (NRUHC)	1993	Head of ENT Department
University Hospital Center of Chad-China Friendship (UHCCCF)	2005	Head of ENT Department
Renaissance University Hospital Center (RUHC)	2014	Head of ENT Department
Military Instruction Hospital (MIH)	2020	Head of ENT Department
University Hospital Center for Mother and Child (UHCMC)	2023	Head of ENT Unit
Hospital of Refoundation (HR)	2026	Head of ENT Unit

3.2. Human Resources

3.2.1. ENT Physicians

The six departments collectively employed 10 ENT physicians, corresponding to a mean of 1.7 ± 0.5 (median: 2; range: 1 - 2). Four of the six departments (67%) had two ENT physicians; the remaining two (UHCMC and HR) had only one. All physicians were male (sex ratio: 10/0). Mean age was 44.7 years ± 4.2 years (range: 37 - 50 years). Mean length of service in the department was 3.4 years ± 3.6 years (range: 0.25-12 years). Of the 10 ENT physicians, two were expatriate practitioners posted at UHCMC and UHCCCF, respectively. Notably, no certified speech-language pathologist or qualified audiologist was present in any of the departments surveyed.

3.2.2. Allied Health Personnel

The total number of allied health staff was 27, corresponding to a mean of (4.5 ± 2.3) people per department (range: 2 - 8). This comprised 12 senior ENT technicians, 11 state-registered nurses, and 4 nursing assistants. The detailed distribution is presented in Table 2.

Table 2. Human resources by the ENT department (2026).

Hospital	ENT Physicians	Senior ENT Technicians	Registered Nurses	Nursing Assistants	Total Allied Health Staff
NRUHC	2	5	3	0	8
UHCCCF	2	3	3	1	7
RUHC	2	0	1	2	3
MIH	2	1	2	0	3
UHCMC	1	1	1	0	2
HR	1	2	1	1	4
Total	**10**	12	11	4	**27**

3.3. Task Delegation

Delegation of ENT clinical tasks to nurses or technicians was practiced in all six departments (100%). It was characterised as "regular" in 5/6 departments (83%) and "occasional/semi-autonomous" in 1/6 (17%—RUHC). The most frequently cited delegated acts were: ear cleaning/cerumen impaction removal (6/6, 100%), simple foreign body extraction (5/6, 83%), post-operative wound dressings and suction (6/6, 100%), assistance in the operating theatre (5/6, 83%), performance of audiometry (3/6, 50%), triage/first-line consultations (3/6, 50%) and management of ENT emergencies in the absence of a physician (4/6, 67%). Written protocols governing such delegation existed in only one department (RUHC, for selected procedures only), representing 1/6 (17%).

3.4. Consultation Equipment

Table 3 presents the availability of consultation equipment across departments. Functional otoscopes, head mirrors/frontal lamps, nasal and aural specula, tongue depressors, laryngeal mirrors, chair-side surgical suction, complete ENT workstations, and stable electrical supply were available in all six departments (100%). The otomicroscope was present in 3/6 departments (50%), the flexible nasopharyngoscope in 2/6 (33%), and the rigid laryngoscope/optics in 3/6 (50%). The mean consultation equipment availability score was 8.3/10 (± 1.2).

3.5. Functional Investigation Equipment

Results are presented in Table 4. Functional pure-tone audiometry was available in 3/6 departments (50%—RUHC, NRUHC, HR). Functional speech audiometry and tympanometry/impedancemetry were absent from all departments (0/6, 0%): at RUHC, these instruments existed but were out of service. Otoacoustic emissions (OAE) and auditory evoked potentials (AEP) were absent from all departments (0/6, 0%). Diagnostic nasopharyngoscopy was available in only 1/6 departments (17%—UHCMC). Indirect laryngoscopy/stroboscopy and vestibular test-

ing/videonystagmography (VNG) were unavailable across all departments (0/6, 0%). Plain radiography was accessible in all departments (6/6, 100%), CT scanning in 4/6 (67%—the MIH scanner being out of service), and MRI in 1/6 (17%—RUHC). Microbiology and anatomopathology laboratory services were accessible in all departments (6/6, 100%).

Table 3. Availability of consultation equipment by the ENT department.

Equipment	NRUHC	UHCCCF	RUHC	MIH	UHCMC	HR	n (%)
Functional otoscope	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Otomicroscope	Yes	No	Yes	No	Yes	No	3/6 (50%)
Head mirror/frontal lamp	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Nasal and aural specula	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Tongue depressors/laryngeal mirrors	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Flexible nasopharyngoscope	No	No	Yes	No	Yes	No	2/6 (33%)
Rigid laryngoscope/optics	No	Yes	Yes	No	Yes	No	3/6 (50%)
Chair-side surgical suction	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Complete ENT workstation	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Stable electrical supply	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)

Table 4. Availability of functional investigation equipment by the ENT department.

Equipment	NRUHC	UHCCCF	RUHC	MIH	UHCMC	HR	n (%)
Pure-tone audiometry (functional)	Yes	No	Yes	No	No	Yes	3/6 (50%)
Speech audiometry (functional)	No	No	OOS*	No	No	No	0/6 (0%)
Tympanometry/impedancemetry (functional)	No	No	OOS*	No	No	No	0/6 (0%)
OAE**/AEP***	No	No	No	No	No	No	0/6 (0%)
Diagnostic nasopharyngoscopy	No	No	No	No	Yes	No	1/6 (17%)
Indirect laryngoscopy/stroboscopy	No	No	No	No	No	No	0/6 (0%)
Vestibular testing/VNG****	No	No	No	No	No	No	0/6 (0%)
Plain radiography	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
CT scan (accessible)	Yes	No	Yes	OOS*	Yes	Yes	4/6 (67%)
MRI (accessible)	No	No	Yes	No	No	No	1/6 (17%)
Microbiology/anatomopathology laboratory	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)

*OOS: Out of Service. **OAE: Otoacoustic Emissions; ***AEP: Auditory Evoked Potentials; ****VNG: Videonystagmography.

3.6. Surgical Equipment and Procedures Performed

Table 5. Surgical equipment and routine ENT procedures by department.

	NRUHC	UHCCCF	RUHC	MIH	UHCMC	HR	n (%)
Equipment							
Dedicated ENT operating theatre	No	No	No	No	Yes	No	1/6 (17%)
Operating microscope	No	No	Yes	Yes	Yes	No	3/6 (50%)
Monopolar electrocautery	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Bipolar coagulation	Yes	Yes	Yes	Yes	Yes	Yes	6/6 (100%)
Otologic instrumentation (tympanoplasty/mastoidectomy)	No	No	No	No	Yes	No	1/6 (17%)
FESS**/rhinologic instrumentation	No	No	No	No	Yes	No	1/6 (17%)
Microdebrider	No	No	No	No	OOS*	No	0/6 (0%)
Laryngoscopy suspension set	No	No	No	No	No	No	0/6 (0%)
Rigid bronchoscope/panendoscope	No	No	No	No	No	No	0/6 (0%)
Emergency tracheotomy kit	Yes	Yes	Yes	Yes	Yes	No	5/6 (83%)
24/7 general anaesthesia with intubation	Yes	Yes	Yes	No	Yes	Yes	5/6 (83%)
Routine Procedures							
Tonsillectomy/adenoidectomy	Yes	Yes	Yes	No	Yes	Yes	5/6 (83%)
Transtympanic drain insertion	No	No	Yes	No	No	No	1/6 (17%)
Tympanoplasty	No	No	No	No	Incipient	No	1/6 (17%)
Mastoidectomy	No	No	No	No	No	No	0/6 (0%)
FESS / endoscopic sinus surgery	No	No	No	No	No	No	0/6 (0%)
Septoplasty/functional rhinoplasty	Yes	No	No	No	Yes	No	2/6 (33%)
Thyroid surgery	Yes	Yes	Yes	No	Yes	Yes	5/6 (83%)
Parotidectomy/submandibular excision	Yes	Yes	Yes	No	Yes	Yes	5/6 (83%)
Cervicofacial oncologic surgery	Yes	No	Yes	No	No	No	2/6 (33%)
Tracheotomy	Yes	Yes	Yes	No	Yes	No	4/6 (67%)

*OOS: Out of Service. FESS: Functional Endoscopic Sinus Surgery. Incipient: procedure initiated but not yet established as routine practice.

Table 5 details surgical equipment availability. Only one department had a dedicated ENT operating theatre (1/6, 17%—UHCMC); the remaining five shared a theatre with other specialties. An operating microscope was available in 3/6 de-

partments (50%—RUHC, UHCMC, MIH). Monopolar electrocautery and bipolar coagulation were present in all six departments (100%). Instrumentation for otologic surgery and functional endoscopic sinus surgery (FESS) was available in only 1/6 departments (17%—UHCMC). The microdebrider, laryngoscopy suspension set, and rigid bronchoscope were absent from all departments (0/6, 0%). Emergency tracheotomy equipment was available in 5/6 departments (83%), and round-the-clock general anaesthesia with intubation in 5/6 (83%). With regard to routine surgical procedures, tonsillectomy/adenoidectomy, thyroid surgery, and parotidectomy/submandibular gland excision were each performed in 5/6 departments (83%). Tracheotomy was performed in 4/6 (67%). Cervicofacial oncological surgery was available in only 2/6 departments (33%—RUHC, NRUHC). Tympanoplasty was performed in only 1/6 department (17%—UHCMC), at an incipient stage not yet constituting established routine practice. FESS and mastoidectomy were performed in none (0/6, 0%). The MIH performed no routine ENT surgical procedures.

3.7. Medical Evacuations Abroad

Over the preceding 12 months, the six ENT departments had collectively referred 34 patients abroad for specialised care, corresponding to a mean of (5.7 ± 3.2) evacuations per department, with a median of 7 and a range of 1 to 9. The MIH recorded the highest number of evacuations (n = 9), followed by RUHC and NRUHC (8 each), UHCMC (n = 6), UHCCCF (n = 2), and HR (n = 1). The 34 evacuations were distributed as follows by principal clinical indication: otological surgery (tympanoplasty, mastoidectomy, cochlear implant candidacy) accounted for 12 cases (35.3%); advanced sinonasal surgery (pansinusitis, extensive nasosinusal polyposis) for 8 cases (23.5%); oncological surgery for 5 cases (14.7%); and complementary audiological investigations for 9 cases (26.5%).

Primary destinations were North Africa (Tunisia, Morocco, Algeria, Egypt) for all departments (6/6, 100%), supplemented by Asia (India) for 2/6 (UHCCCF, MIH), Europe (France, Germany) for 1/6 (UHCMC), and sub-Saharan Africa for 2/6 (UHCMC, NRUHC).

The principal reasons for evacuation were: inadequacy of local technical resources (CT, MRI, laser, etc.) in 4/6 departments (67%), lack of specialist expertise or subspecialty services (oncology, advanced otology, cochlear implantation) in 4/6 (67%), and patient or family request in 3/6 (50%).

In the absence of a structured national coverage mechanism, the primary financial burden of medical evacuation fell upon patients and their families in all six departments. Supplementary partial coverage was nonetheless available in certain cases: insurance or mutual funds in 2/6 departments, state funding in 1/6 (NRUHC), and NGO support in 1/6 (UHCMC).

3.8. Continuing Medical Education

No department had a formalised, regular continuing education programme (0/6,

0%). Three of the six departments (50%—UHCCCF, UHCMC, RUHC) reported an informal or occasional educational programme. Weekly departmental meetings were held in 4/6 departments (67%). International congresses were attended by staff from 3/6 departments (50%), national congresses in 2/6 (33%), and online learning (webinars, MOOCs) in 3/6 (50%). Only RUHC had participated in hands-on workshops. HR reported no educational activity over the preceding 12 months. Training of allied health staff was provided on an occasional basis in only 2/6 departments (33%—RUHC, MIH).

3.9. Infection Control and Patient Safety

Accessible centralised sterilisation and a functional autoclave were available in all six departments (100%). Single-use instruments were employed for high-risk procedures in 5/6 departments (83%). A written surgical antibiotic prophylaxis protocol existed in 4/6 (67%). Hand hygiene protocols were posted and implemented in 5/6 (83%). A blood/body fluid exposure management kit was available in 4/6 (67%). Surgical site infection (SSI) surveillance was maintained in 4/6 (67%). A Healthcare-Associated Infection Control Committee (HAICC) existed in 5/6 departments (83%, including one with partial functionality). An adverse event reporting system was in place in 5/6 (83%).

3.10. Patient Satisfaction and Quality Indicators

Patient satisfaction measurement was conducted on an occasional basis in 5/6 departments (83%). A formal patient reception and information system existed in 3/6 (50%). Activity registers were maintained systematically in all six departments (100%), and standardised patient records in 5/6 (83%). Regular monitoring of quality indicators was operational in 4/6 (67%), and morbidity and mortality conferences were held regularly in 4/6 (67%). Internal clinical audits had been conducted in 4/6 (67%). Formalised written procedures and protocols existed in only 1/6 of the departments (17%). No department had initiated a certification or accreditation process (0/6, 0%). Regular feedback of quality indicators to the clinical team was achieved in only 2/6 departments (33%). A formal quality improvement initiative was declared as ongoing in 2/6 departments; 1 department had a short-term project under development; the remaining 3 had neither an ongoing initiative nor any project in planning.

3.11. Composite Quality Improvement Score Results

The composite quality improvement score, calculated out of 12 points, ranged from 4 (HR) to 11 (RUHC). RUHC achieved the highest score (11/12), notably owing to medical care delivered entirely by ENT physicians and an established surgical caseload spanning multiple subspecialties. UHCMC and NRUHC were positioned at an intermediate level with 8/12 each, followed by UHCCCF (6/12) and MIH (5/12). HR, the most recently established service (2026), recorded the lowest score (4/12).

4. Discussion

This study reveals major deficiencies in N'Djamena's tertiary ENT services, affecting human resources, technical capabilities and organisational governance alike. With only 10 specialist physicians—including two expatriates—the national specialist density remains far below international standards, corroborating the shortages previously documented across sub-Saharan Africa [2]-[4]. Expressed relative to the local population, these 10 specialists correspond to a density of approximately 0.56 per 100,000 inhabitants in N'Djamena (estimated population: approximately 1.8 million in 2026) and approximately 0.05 per 100,000 inhabitants at the national level (estimated population: approximately 21 million in 2026 [9])—both figures being dramatically below the global average of 2.19 per 100,000 recorded in high-income countries [2], and placing Chad among the countries with the most critical ENT specialist shortages worldwide. The complete absence of certified speech-language pathologists and qualified audiologists constitutes a critical structural weakness, substantially limiting multidisciplinary management of hearing, voice and swallowing disorders [2].

Task delegation to allied health staff was observed universally across departments, yet seldom governed by formalised protocols. While task-shifting represents a recognised pragmatic strategy in settings of medical workforce scarcity [10], its implementation without written protocols or rigorous supervision may jeopardise care quality and patient safety. Importantly, our findings demonstrate that departmental performance is determined not solely by staffing levels, but above all by the extent to which ENT physicians are directly and personally involved in specialised clinical care.

Consultation equipment appeared broadly adequate for basic clinical practice, yet remained uneven for the tools central to modern ENT medicine, notably the flexible nasopharyngoscope, otomicroscope, and rigid optics. Of even greater concern was the near-total absence of functional investigation capacity: speech audiometry, tympanometry, otoacoustic emissions, auditory evoked potentials, vestibulometry, and stroboscopy were virtually non-existent. This deficiency severely restricts the early diagnosis and management of hearing disorders—recognised as a foremost public health priority on the African continent [1] [11].

In the surgical domain, the study exposes a substantial gap between theoretical equipment availability and actual operative capacity. Certain centres possessed specialised instruments without the competence to deploy them effectively, owing to inadequate training. Conversely, other departments with more modest equipment maintained an effective surgical caseload through greater practitioner autonomy. These observations confirm that specialised human expertise remains the primary determinant of a department's real-world performance—more so than the mere presence of equipment [12].

The 34 medical evacuations recorded over a single year directly reflect local constraints in advanced diagnostic investigation and subspecialty surgery. They represent not only a marker of structural failure but also a substantial economic

burden on patients and their families, who bear the primary financial cost in the absence of a national coverage mechanism.

The absence of formalised continuing education programmes in most departments constitutes a further critical weakness. Sustained continuing medical education is essential for maintaining clinical competence, maximising the return on technical investments, and achieving durable improvements in care quality [4] [13] [14].

Finally, while several departments have established foundational elements of hospital infection control, quality improvement initiatives remain insufficiently institutionalised. The near-universal absence of accreditation processes, regular audits, and standardised protocols underscores a significant lag in quality governance—an imperative in contemporary hospital systems [15] [16].

In sum, N'Djamena's tertiary ENT departments exhibit genuine but heterogeneous clinical capacities, constrained by specialist shortages, a critical deficit in functional investigation, underutilisation of available equipment, and an incomplete quality management structure. The simultaneous reinforcement of human competencies, technical resources, and governance mechanisms is indispensable to achieving durable improvement in national ENT care provision.

5. Limitations

This study has several limitations. The reliance on self-reported data exposes findings to social desirability bias and the risk of over-reporting of best practices, in the absence of objective, independent verification of equipment availability and actual clinical practices. Sample size is inherently limited to six departments by the exhaustive nature of the study at the tertiary level; while this represents the entirety of eligible facilities in N'Djamena, it precludes statistically robust comparative analyses between departments. The composite quality score, although systematically constructed, has not undergone external psychometric validation, and its reproducibility remains to be established. Finally, the cross-sectional design and the brief data collection window preclude any assessment of temporal variation in resources or practices, or the establishment of causal relationships between the factors explored and care quality outcomes. Annual activity volumes (outpatient consultations, inpatient admissions, and surgical procedures) could not be reliably retrieved: data collection was conducted in April 2026, at which point several departments had not yet completed their activity registers for the current year, rendering aggregate workload figures unreliable. This precluded the workload-stratified analysis of resource and staffing gaps; future assessments should incorporate systematic prospective collection of activity data.

6. Conclusion

This study provides, for the first time, a comprehensive situational analysis of all six tertiary ENT departments in N'Djamena. It reveals significant inter-departmental inequalities and highlights major structural deficits: insufficient medical

and allied health specialist staffing, near-complete absence of audiological functional investigation, surgical capacity confined to a limited number of sites and procedures, unregulated task delegation, lack of formalised continuing education, and weak quality improvement culture in several departments. These findings constitute an indispensable evidence base for guiding a national policy of ENT development in Chad, and will serve as a reference benchmark against which to evaluate future progress.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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