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Original Research Article

Evaluating knowledge, exposure and barriers to endoscopy training among medical doctors in Rivers State, Nigeria: a preliminary cross-sectional study

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ABSTRACT

Background: Gastrointestinal endoscopy training remains severely limited in sub-Saharan Africa despite its importance as a diagnostic and therapeutic modality. This study investigated the awareness of, exposure to, and barriers surrounding endoscopy training among medical doctors in a tertiary health facility in Rivers State, Nigeria.
Methods: An exploratory cross-sectional study was conducted on 56 doctors of the Rivers State University Teaching Hospital using a valid instrument made up of 16 items. Participants' demographics, awareness, and exposure were assessed by the researchers. Some statistical tools, including descriptive statistics and Fisher's Exact test, were employed in this study.
Results: High self-reported awareness of endoscopy was reported at 96.4%, with 94.6% having identified it through its definition and 91.1% aware of its role in diagnosis as well as treatment. The percentage of those who received formal endoscopy training was at 10.7%, whereas 30.4% received procedural involvement. Nearly all respondents (98.2%) reported the absence of an endoscopy training laboratory and 75.0% indicated an inability to self-sponsor training. Middle-cadre professionals (Registrars and Senior Registrars) showed higher procedural involvement, though this was not statistically significant (p=0.142).
Conclusion: Despite adequate theoretical awareness, medical doctors in Rivers State face critical deficits in endoscopy training infrastructure and funding. Establishment of simulation-based training programmes and government-sponsored funding initiatives are urgently needed.

Keywords: Clinical competence, Endoscopy training, Medical education, Simulation-based learning, Surgical residency, Resource-limited settings

INTRODUCTION

Indeed, the advent of endoscopy has revolutionized the field of gastroenterology and surgery in diagnostic and therapeutic terms. Endoscopy has improved clinical outcomes in postoperative settings, decreased length of stay in hospital, and enabled clinicians to accurately diagnose difficult gastrointestinal ailments, among others.[1] In the developed world, esophagogastroduodenoscopy and colonoscopy are routine and structured parts of medical and surgical resident training. Yet in sub-Saharan Africa, there are many institutional obstacles to the integration of endoscopic training in the education of future healthcare

providers who are faced with a high burden of peptic ulcer diseases, variceal bleeding, and colorectal cancer.[2] Moreover, as the availability of these services improves, doctors need to have not only the necessary clinical skills but also adequate interpersonal abilities to communicate with patients and provide effective psychological support.[3] However, the technical capacity to manage these cases using endoscopic techniques in the region is still extremely poor compared to the prevalence of the diseases.[4]

In terms of the Nigerian setting, gaining endoscopic competencies happens more through opportunity than deliberate planning. According to studies, although different specialists recognize the importance of conducting endoscopy in medical practice, they receive very little practical experience at a formative stage of training.[5] One recently conducted national assessment identified significant deficits in endoscopic competencies among physicians in Nigeria due to the shortage of proper equipment, poor maintenance resources, and lack of well-designed curricula.[6] In addition, financial challenges restrict opportunities for obtaining relevant certificates autonomously. Still, some centres attempt to provide endoscopic skills training via simulation-based workshops and multi-institutional partnerships.[7,8]

The concept of clinical skills development is grounded in Competency-Based Medical Education (CBME). Traditionally, endoscopic training has been based on the "see, do, and teach" principle, where a sufficient number of endoscopy procedures is a prerequisite for competency.[8] Contemporary medical teaching is based on the belief that there is a difference between individuals in the acquisition of psychomotor skills, and that training is based on observation, simulation, and hands-on practice.[1] Simulation serves as the bridge between theory and practice that could not be provided otherwise.[9] If the simulated environment is not present, this CBME model will not work, as trainees will be skilled in theory but deficient in practical skills.

Based on an analysis of the literature, there is a clear difference in the geographic and specialty-specific distribution of data. Previous studies have mainly concentrated on the experience of trainees in the country's federal capital, Abuja, or conducted general surgical audits throughout Nigeria.[6,10] However, there is a marked absence of empirical data describing the exact needs in terms of education and infrastructure in the Niger Delta region. While Rivers State contains tertiary health facilities serving millions of people, no prior assessments of the training needs for endoscopy in medical practitioners working here have been documented.

To fill this gap in knowledge, an exploratory study was undertaken to examine the knowledge, exposure, and systemic barriers to endoscopy training among doctors in Rivers State. The study's objectives specifically were to: analyze the extent of knowledge related to the use of endoscopy in a clinical setting; find the proportion of trainees that have received training; assess the structural obstacles, especially access to proper facilities and simulation centers; and analyze financial constraints and the necessity for government funding vs. self-funding.

METHODS

Study design and setting

For this pilot study, an exploratory and descriptive cross-sectional research design was used. This design was considered the most suitable to provide baseline data regarding the levels of knowledge, experience, and structural barriers among the targeted respondents. The study was carried out at the Rivers State University Teaching Hospital (RSUTH), situated in Port Harcourt, Rivers State, Nigeria. RSUTH is a major tertiary referral and training institution in the Niger Delta region for both house officers and resident doctors.

Study population and eligibility criteria

The target population included medical doctors practicing and training at RSUTH. To be eligible, doctors had to hold a full, unrestricted license to practice in disciplines where endoscopy is an integral component of clinical practice, including surgery, internal medicine, obstetrics and gynaecology, paediatrics, and family medicine. Physicians on leave at the time of the survey and those who declined to participate were excluded.

Sample size and sampling technique

Applying Cochran's formula for cross-sectional studies ($n=Z^2pq/e^2$) with a 95% confidence level and an assumed 50% prevalence, the theoretical sample size was calculated at 384. However, given the limited total cadre of physicians across the eligible departments during the study window, a convenience sampling approach was applied, yielding 56 complete responses. This study is therefore positioned as an exploratory pilot investigation.

Research instrument

Data collection utilized a structured 16-item questionnaire comprising three sections: Sociodemographic Data (age, sex, professional rank, duration of training, and specialty); Knowledge and Awareness of Endoscopy (clinical definitions and indications); and Exposure to Formal Training and Infrastructure (access to equipment, routine involvement, prior formal training, simulation laboratory availability, and funding capacity).

Validity and reliability

Content and face validity were established by two senior consultants in gastroenterology and medical education. Reliability was evaluated via pretesting among a cohort

of doctors at a secondary healthcare facility, yielding acceptable internal consistency (Cronbach's α=0.76).

Data collection procedure

Data collection was conducted over a four-week period from January 2025 to February 2025. Questionnaires were administered self-completed in person across clinical departments and wards. Study objectives were explained and written informed consent was obtained prior to questionnaire administration.

Data analysis

Data were coded, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 29. Descriptive statistics (frequencies and percentages) were computed for sociodemographic, knowledge, and exposure variables. Fisher's Exact Test was used to evaluate the association between professional cadre and routine endoscopy involvement due to small expected cell counts (<5). Effect size was calculated using Cramér's V. Statistical significance was defined as $p<0.05$.

Ethical considerations

Ethical approval was granted by the Ethics and Research Committee of the Rivers State University Teaching Hospital, Port Harcourt, Nigeria. Participation was strictly voluntary and anonymous; no, personally identifiable information was gathered.

RESULTS

Sociodemographic profile

Sociodemographic features of the participants (N=56) are shown in Table 1. It was found that gender of the respondents had an almost equal representation, with female representing 53.6% (n=30) of the population, while male respondents making up the rest 46.4% (n=26). Most of the surgical residents are between 25 to 30 years (n=24, 42.9%) and >30 years (n=24, 42.9%) in age. Registrars represent the largest group, making up 42.9% (n=24) of the participants and then House officers, who make up 32.1% (n=18). No medical officers were included. Surgery is the major specialty. Surgery makes up 50% of the respondents.

Knowledge and awareness of endoscopy

Table 2 outlines the respondents' cognitive awareness regarding endoscopy. An overwhelming majority (96.4%) self-reported that they knew what endoscopy was. When presented with a definition recognition item, 94.6% correctly identified that endoscopy is distinct from ultrasound, open surgery, or strict laparoscopy ("None of the above"). Furthermore, 91.1% accurately reported that endoscopy serves both diagnostic and therapeutic purposes.

Exposure, training and infrastructural capacity

Despite high self-reported familiarity, practical exposure and facility capacity were recorded at critically low levels, as detailed in Table 3. Only 10.7% (n=6) of the doctors had received any formal training in endoscopy. Routine involvement in endoscopy was reported by 30.4% (n=17) of respondents. Critically, 98.2% (n=55) stated that their facility lacked an endoscopy training laboratory.

Financially, three-quarters of the sample (75.0%) indicated an inability to self-sponsor advanced training, driving a near-universal consensus (96.4%) that government-sponsored initiatives are essential to bridge the manpower gap.

Inferential analysis: professional level and routine exposure

To examine the relationship between a doctor's professional level and their involvement in routine endoscopy, a cross-tabulation was performed (Table 4). Given the small expected cell counts, Fisher's Exact Test was utilised.

The analysis revealed a visible trend where Registrars and Senior Registrars reported higher proportions of routine involvement compared to House Officers. Interestingly, Consultants reported lower routine involvement (28.6%) than middle-tier residents. However, the overall association across ranks did not reach statistical significance in this small sample (Fisher's Exact p=0.142; Cramér's V=0.28). While the effect size suggests a moderate underlying relationship, the small sample size constrains the statistical power needed to confirm it definitively.

Table 1: Sociodemographic characteristics of respondents (n=56).

Variables	Category	Frequency (N)	Percentage (%)
Age (years)	< 20	0	0.0
	20–24	8	14.3
	25–30	24	42.9
	> 30	24	42.9
Gender	Male	26	46.4
	Female	30	53.6

Continued.

Variables	Category	Frequency (N)	Percentage (%)
Professional level	House officer	18	32.1
	Medical officer	0	0.0
	Registrar	24	42.9
	Senior registrar	7	12.5
	Consultant	7	12.5
Specialty	Surgery	28	50.0
	Gynaecology	10	17.9
	Paediatrics	8	14.3
	Family medicine	10	17.9

Table 2: Knowledge of endoscopy (n=56).

Variables	Response	Frequency (N)	Percentage (%)
Do you know about endoscopy?	Yes	54	96.4
	No / Maybe	2	3.6
Endoscopy is the same as:	Ultrasound / Open surgery / Laparoscopy	3	5.4
	None of the above	53	94.6
Endoscopy can be used for:	Diagnostic only	1	1.8
	Therapeutic only	4	7.1
	Both diagnostic and therapeutic	51	91.1

Table 3: Exposure to formal training and infrastructure (n=56).

Variables	Response	Frequency (N)	Percentage (%)
Received formal training in endoscopy?	Yes	6	10.7
	No	50	89.3
Involved in routine endoscopy?	Yes	17	30.4
	No / Maybe	39	69.6
Endoscopy training laboratory in facility?	Yes	1	1.8
	No	55	98.2
Able to self-sponsor endoscopy training?	Yes	14	25.0
	No	42	75.0
Government-sponsored training will reduce gap?	Agree / Strongly agree	54	96.4
	Neutral / Disagree	2	3.6

Table 4: Cross-tabulation of professional level by routine endoscopy involvement.

Professional level	Involved in routine endoscopy (Yes)	Not involved / Maybe	Total (N)
House Officer	2 (11.1%)	16 (88.9%)	18
Registrar	10 (41.7%)	14 (58.3%)	24
Senior Registrar	3 (42.9%)	4 (57.1%)	7
Consultant	2 (28.6%)	5 (71.4%)	7
Total	17 (30.4%)	39 (69.6%)	56

DISCUSSION

The aim of this exploratory research was to examine the awareness, exposure, and systemic limitations regarding endoscopic training among medical doctors in Rivers State. It was found that there is a disparity between a medical workforce with a good theoretical understanding but lack of necessary infrastructure and finances in the educational setting for practical application of knowledge.

Knowledge and awareness

The finding that 96.4% of participants reported adequate cognitive awareness of endoscopy with 94.6% correctly identifying its definition and 91.1% recognizing its dual

diagnostic and therapeutic roles indicates solid baseline knowledge. This is consistent with the findings of Ezeike et al who reported that surgical and gynaecology residents in Abuja possessed adequate cognitive knowledge of endoscopic procedures despite limited practical exposure.[10] Similarly, Olokoba et al observed that endoscopic services in Nigeria were underutilized not because of clinician ignorance, but primarily due to institutional and manpower bottlenecks.[4] The present study confirms that this high cognitive awareness extends to doctors practicing in the Niger Delta region.

Training exposure and the apprenticeship gap

A notable paradox identified in this study is the gap between formal training (10.7%) and routine procedural involvement (30.4%). This indicates that nearly one out of every three doctors reported having performed endoscopies without proper training. This aligns with Alatise et al nationwide survey, which found significant shortages of training programs among Nigerian doctors similar to what is happening in the U.S..[6] Kingpriest et al similarly observed that Nigerian trainees receive minimal supervised procedural exposure to essential surgical interventions during their formative training years.[5] This discrepancy stems from the traditional "apprenticeship" model prevalent in low-resource settings, where trainees learn predominantly through unstandardized observation or opportunistic bedside assistance. However, Sedlack has demonstrated that procedural competence requires validated, objective assessment metrics rather than informal case volume or passive observation.[11] While observation has value, it fails to meet the structured milestones required by Competency-Based Medical Education frameworks.[1]

Infrastructural barriers

The most critical barrier identified in this study is infrastructural deficiency: 98.2% of respondents confirmed that their institution lacked an endoscopy training laboratory. This finding corroborates the national survey by Alatise et al which cited equipment shortages and absent training facilities as the foremost impediments to surgical endoscopy development across Nigeria.[6] Enweluzo and Giwa, evaluating endoscopic practice in South-South Nigeria, similarly reported that service delivery was severely restricted by equipment shortages and absent training suites in the Niger Delta.[2] In contemporary medical education, simulation training is considered an essential prerequisite before trainees perform procedures on patients. Cohen et al demonstrated in a multicentre randomized controlled trial that virtual-reality simulator training significantly accelerated colonoscopy skill acquisition among novice trainees compared to conventional training alone.[12] Furthermore, Walsh emphasized that validated simulation assessment tools are critical for safeguarding patient safety during the initial learning curve.[13] The near-total absence of dry-lab or simulation facilities at the study centre severely limits trainees' ability to acquire psychomotor skills in a safe, repeatable environment.[2] As demonstrated by Mulima et al in Malawi, integrating simulation workshops through structured collaborations can successfully overcome these facility deficits in sub-Saharan Africa.[8]

Financial barriers

Financial constraints represent another major barrier, with 75.0% of respondents indicating an inability to self-fund certified endoscopy training. This is consistent with reports by Kingpriest et al and Alatise et al who identified individual financial burden as a leading obstacle to advanced surgical skills acquisition in Nigeria.[5,6] Endoscopy training courses and certifications are expensive, and in the absence of institutional sponsorship, trainees bear the cost independently. This explains the 96.4% consensus among respondents that government-funded training initiatives are essential. In contrast to the self-funding model, Mulima et al showed that donor-supported and government-partnered training programmes in Malawi achieved sustainable skill acquisition within a public referral hospital, demonstrating the feasibility of funded interventions in resource-constrained environments.[8]

Professional level and procedural exposure

Although the association between professional cadre and routine endoscopy involvement did not achieve statistical significance ($p=0.142$), the observed trend reflects the hierarchy of residency training: Registrars (41.7%) and Senior Registrars (42.9%) had greater procedural involvement than House Officers (11.1%). This aligns with observations by Ezeike et al in Abuja, where senior residents had higher operative exposure than junior trainees.[10] Interestingly, Consultants reported lower routine participation (28.6%) than middle-tier residents, likely because consultants manage complex cases independently rather than participating in routine training lists, or due to the small consultant subgroup (n=7). Nevertheless, procedural involvement across all cadres remains low. If Senior Registrars do not achieve certified procedural competence, they will be unable to train incoming cohorts, perpetuating the training deficit that Sedlack warned against.[11]

Limitations

There are several limitations associated with this study. First, as a result of the small sample size (n=56), the number of the participants was too low compared to what could be considered theoretically optimal according to statistical sampling equations; hence, the findings cannot be generalized. Second, half of the participants came from the Department of Surgery. As a consequence, although the findings are relevant for surgery, they may not be sufficient enough to reflect reality for Paediatrics and Family Medicine. Finally, though the Department of Internal Medicine was listed among the Departments

considered for the sampling, no individual could be found there at the moment of the study. It is also necessary to state that not one representative among the Medical Officers became a part of the sample (0.0%), which might be explained by either the particular clinical rotations during the period of collecting data or the fact that some medical facilities never use Medical Officers (those who are not residents) on the wards dealing with gastroenterology. Finally, the survey contained items that were focused on evaluating the knowledge of the respondents through self-reporting, for example, "Are you familiar with endoscopy?" without the use of clinical tests.

CONCLUSION

Although medical doctors in Rivers State possess high theoretical knowledge regarding gastrointestinal endoscopy, practical skill acquisition is critically impeded by absent simulation infrastructure, reliance on informal apprenticeship, and lack of training funds.

Recommendations

The following recommendations are proposed: Establishment of Simulation Laboratories: Hospital management and the State Ministry of Health should prioritize the procurement of low-cost endoscopy simulators to provide a dedicated dry-lab training environment before live-patient exposure. Postgraduate curriculum reform: postgraduate medical colleges should formally integrate structured simulation hours and supervised procedural quotas as mandatory prerequisites for fellowship examinations. Institutional and government sponsorship: targeted training subventions should be established by health ministries to sponsor resident doctors for certified endoscopy workshops, removing the burden of self-financing. Collaborative partnerships: tertiary centres should pursue partnerships with international gastroenterology and surgical societies to conduct "train-the-trainer" courses and secure equipment grants.

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