Nigerian Journal of Medical Imaging and Radiation Therapy

Journal home page: https://njmirt.com

ISSN: 0189-4501 **DOI:** https://doi.org/10.68947/njmirt-NMOO7960

Brain drain in the making: migration intentions of clinical radiography students in a single academic institution in Nigeria

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Article information

Received: 18 Sept. 2026
Received in revised form: 12th Oct. 2026
Accepted: 15th Oct 2026
Available online: 13th Nov. 2026

Keywords
Brain drain, Migration intention, Radiography students, Healthcare workforce, Workforce retention, Nigeria.

Abstract

Background: Migration of healthcare professionals from low- and middle-income countries poses challenges to healthcare workforce sustainability. Although international migration among healthcare professionals is a growing concern in Nigeria, evidence on migration intentions among undergraduate radiography students remains limited. This study assessed migration intentions and patterns among clinical radiography students at a Nigerian university.

Methods: A single-centre, cross-sectional questionnaire survey was conducted among 300-, 400-, and 500-level radiography students at the University of Maiduguri, Nigeria. All 357 eligible students were invited to participate through their respective class WhatsApp platforms. Data were collected using a self-administered online questionnaire developed by the research team and subjected to face validation. The questionnaire assessed sociodemographic characteristics, migration intentions, destination preferences, anticipated migration timeframe, motivating factors, and potential retention considerations. Descriptive statistics were used to summarise the responses.

Results: Of 357 eligible students, 200 completed the questionnaire (response rate: 56.0%). Overall, 78.0% (156/200) expressed an intention to practise abroad after graduation. The most frequently preferred destinations were Qatar (28.0%, n = 56), the United Kingdom (27.5%, n = 55), and Canada (17.0%, n = 34). Major factors motivating migration included opportunities for professional development (55.5%, n = 111), improved remuneration (36.5%, n = 73), better working conditions (36.5%, n = 73), and improved quality of life (35.5%, n = 71). Approximately 46.0% (n = 92) reported having taken steps towards migration, while 52.0% (n = 104) indicated an anticipated stay abroad of 5–10 years. Notably, 79.0% (n = 158) indicated that improved career prospects and remuneration could encourage them to remain in Nigeria.

Conclusion: A high proportion of surveyed clinical radiography students expressed intentions to practise abroad, principally motivated by professional and economic considerations. Nevertheless, the substantial willingness to remain in

Nigeria under improved career and remuneration conditions suggests potential opportunities for workforce retention interventions.

Introduction

Human resources are, without a doubt, the most important component of all productivity. They are active actors who create social, economic, and political organisations; gather resources, utilise them, and advance societal growth. Economic growth and development cannot be achieved with physical capital alone, such as machinery and other technology, without the necessary human capital in the form of human skill, and this holds in all walks of human endeavour, especially in healthcare [1]. Healthcare personnel are the wheels that run the healthcare system and provide essential services to the populace, a key prerequisite for sustainable socio-economic development [2]. Radiography is one of the crucial allied healthcare occupations. Radiographers play a vital role in managing and treating patients alongside other members of the healthcare workforce. However, most low-income countries face shortages of various healthcare practitioners because fewer schools offer these courses, sessions are unstable, and fees are high; this is exacerbated by migration and brain drain due to economic, political, social, and cultural factors [3]. Nigerian medical professionals, such as physicians, nurses, and pharmacists, have a history of leaving the country to work in developed nations [3]. Beyond established push and pull factors driving brain drain, the COVID-19 pandemic accelerated the emigration of Nigerian healthcare professionals, as high-income countries intensified recruitment in response to workforce shortages exposed during the pandemic [3,4].

This trend is reflected in current workforce patterns. Radiographer migration has been rising in Nigeria, with at least five radiographers leaving the country weekly [5]. Students may be influenced by this trend, as many migrants are their senior colleagues. In fact, according to a study [6], migration also affects final-year students in health-related disciplines worldwide, who constitute a ready pool of potential labour migrants. Previous studies note a growing preference among graduates and students of health disciplines in Nigeria to migrate abroad [6,7]. This is a major policy concern because it will further reduce the number of radiographers in the country, where there are not enough to serve patients and provide services effectively and efficiently [8–10]. Reducing medical students' intentions to migrate is essential to creating and sustaining a robust healthcare system, as it is one of the most important indicators of the future of a nation's healthcare system.

Numerous studies have examined migration intentions among doctors in training [11], other healthcare professionals [12–14], and pharmacy students [15]. However, research focusing on radiography students, especially from this part of the world, remains limited. Therefore, this study aimed to assess migration intentions, preferred destinations, intended duration of stay, and factors influencing migration among clinical radiography students at the University of Maiduguri, Nigeria.

Materials and Methods

This cross-sectional study employed a census survey approach to assess migration intentions among clinical radiography students at the University of Maiduguri, Borno State, Nigeria. The target population comprised undergraduate radiography students in their third, fourth, and fifth years. All students within these academic levels were eligible to participate, provided they voluntarily consented to the study.

Data were collected using a structured, self-administered online questionnaire developed based on the study objectives and relevant literature. The research team reviewed the questionnaire for content

validity. However, no formal statistical assessment of its reliability was conducted. The instrument covered respondents' sociodemographic characteristics, migration intentions, preferred destination countries, intended migration timeframe, reasons for considering migration, and factors that could encourage them to remain in Nigeria.

The questionnaire was administered through Microsoft Forms (Microsoft Corporation, Redmond, WA, USA), and the survey link was distributed via the respective WhatsApp groups of eligible student cohorts. Although a census approach was adopted to invite all eligible students, actual participation was voluntary and depended on students' willingness and availability to respond. Informed consent was obtained electronically before questionnaire completion.

Ethical approval was obtained from the Research Ethics Committee of the Department of Medical Radiography, University of Maiduguri, Nigeria

Results

Sociodemographic Characteristics of Respondents

A total of 200 clinical radiography students participated in the study, representing a response rate of 56.0% (200/357). Most respondents were aged 21–25 years (68.0%, n = 136), followed by those aged 26–30 years (27.5%, n = 55). Most respondents were male (64.5%, n = 129), unmarried (87.0%, n = 174), and in their fifth year of study (42.5%, n = 85). The sociodemographic characteristics of the respondents are presented in Table 1.

Migration Intentions and Preferred Destinations

Regarding migration intentions, 78.0% (n = 156) of respondents reported having considered migrating abroad to practise radiography after graduation. An additional 7.0% (n = 14) indicated that they might consider migrating, whereas 15.0% (n = 30) had not considered migration.

Qatar was the most frequently preferred migration destination (28.0%, n = 56), followed closely by the United Kingdom (27.5%, n = 55) and Canada (17.0%, n = 34). Kuwait and the United States of America were preferred by 7.5% (n = 15) and 5.0% (n = 10) of respondents, respectively. Other destinations accounted for smaller proportions of responses. The distribution of preferred migration destinations is illustrated in Figure 2.

Intended Duration of Stay Abroad

Regarding the intended duration of stay abroad, slightly more than half of the respondents (52.0%, n = 104) indicated that they intended to remain in their destination country for 5–10 years. Furthermore, 20.5% (n = 41) intended to stay for 10–15 years, while 20.0% (n = 40) expressed an intention to remain abroad indefinitely. The remaining 7.5% (n = 15) planned to stay for 15–20 years. These findings are presented in Figure 3.

Factors Influencing Migration Intentions

Several factors motivated respondents' intentions to migrate. The most frequently reported factor was the pursuit of better personal and professional development opportunities (55.5%, n = 111). Better remuneration and improved working conditions were each reported by 36.5% (n = 73) of respondents, while 35.5% (n = 71) identified a better quality of life as a motivating factor. The distribution of factors influencing migration intentions is presented in Table 2.

Table 1. Socio-Demographic Presentation of the Respondents

Socio-Demography	Frequency	Percent (%)
Age (years)		
21-25	136	68
26-30	55	27.5
31-35	7	3.5
36-40	2	1
Gender		
Female	71	35.5
Male	129	64.5
Total	**200**	**100**
Marital status		
Married	24	12
Single	174	87
Nil	2	1
Total	**200**	**100**
Level		
300 level	59	29.5
400 level	56	28
500 level	85	42.5
Total	**200**	**100**

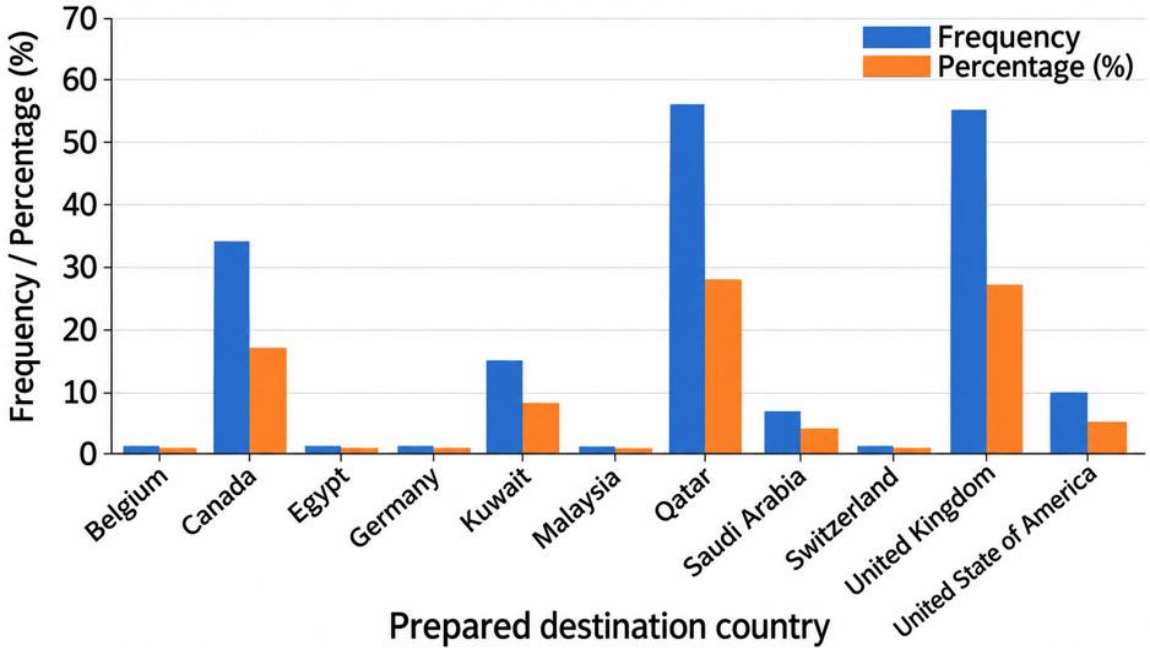


Figure 2. Preferred Countries of Migration among Respondents

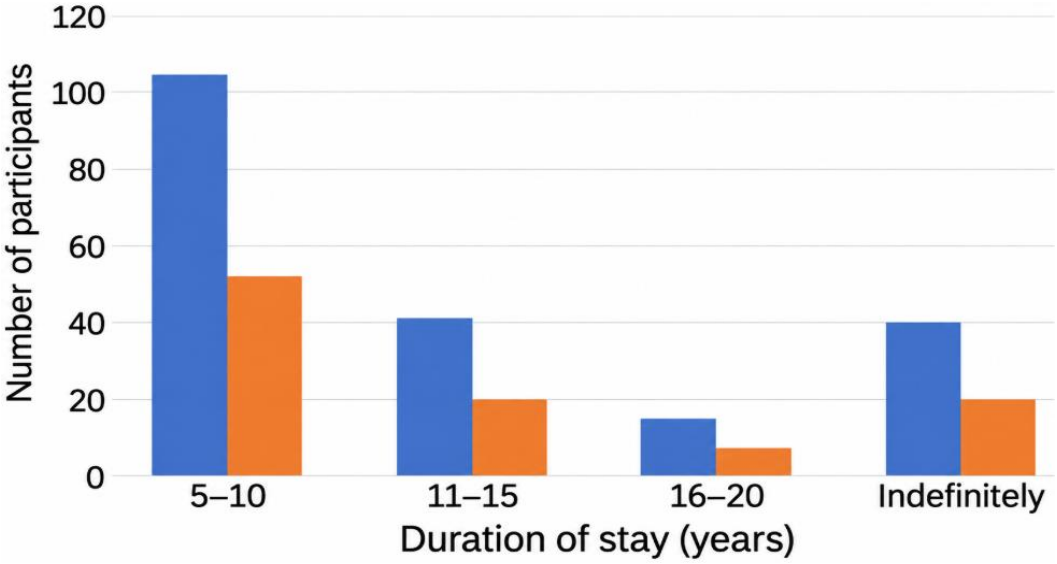


Figure 3. Intended duration of stay in the country of destination

Table 2. Reasons for Migration Intentions

Variable	Category	Frequency	Percentage (%)
Why do you wish to leave Nigeria for other countries to practice?	Better pay	73	36.5
	Better quality of life	71	35.5
	Better working environment.	73	36.5
	Better personal and professional improvement	111	55.5
Have you taken any steps to practise radiography abroad (researching requirements, having mentors in the diaspora, making enquiries, etc.)?	Yes	108	54
	No	92	46
Would you consider practising radiography in Nigeria if better career prospects and higher salaries were available?	May be	35	17.5
	No	7	3.5
	Yes	158	79

Discussion

This study assessed migration intentions among clinical radiography students at the University of Maiduguri, Nigeria. Male students constituted 64.5% of respondents, consistent with previous studies reporting male predominance [6,16]. This may partly reflect gender disparities in access to higher education in Northern Nigeria, where female participation remains relatively low [17–19]. However, institutional enrolment patterns may also explain this finding.

A substantial proportion of respondents (78.0%) had considered migrating abroad after graduation, while 7.0% were undecided and 15.0% had not considered migration. This finding agrees with previous studies reporting high migration intentions among healthcare students and professionals, often attributed to unfavourable working and living conditions [6,11]. However, it contrasts with a Pakistani study in which only 33.3% of medical students intended to migrate, while 66.6% preferred to remain in their home country [14]. This difference may reflect variations in socioeconomic conditions, professional expectations, and perceived career opportunities.

Qatar (28.0%) and the United Kingdom (27.5%) were the most preferred migration destinations. Their popularity may be associated with perceived opportunities for professional advancement, specialisation, postgraduate education, and favourable working conditions [20,21]. Regarding the intended duration of stay, 52.0% planned to remain abroad for 5–10 years, while 20.0% intended to stay indefinitely. These findings suggest that migration may be viewed as either a temporary career opportunity or a long-term relocation. Previous studies have highlighted the importance of family ties and improved domestic conditions in influencing return migration [6,15,22].

Professional development was the leading motivation for migration (55.5%), followed by better remuneration and working conditions (36.5% each) and improved quality of life (35.5%). These findings agree with previous studies identifying limited career opportunities, inadequate remuneration, and unfavourable working conditions as major drivers of healthcare workforce migration [12,16,23–25]. The prominence of professional development suggests that retention strategies should extend beyond financial incentives to include postgraduate training, specialisation, and career advancement opportunities.

Notably, 79.0% of respondents indicated a willingness to remain in Nigeria if career prospects and remuneration improved, while 3.5% would migrate regardless of these improvements and 17.5% were undecided. This is consistent with previous evidence suggesting that addressing unfavourable employment conditions may improve healthcare workforce retention [26,27]. Nevertheless, migration decisions remain multifactorial, influenced by professional, economic, and personal aspirations [6]. These findings highlight the importance of improving remuneration, working conditions, and professional development opportunities to enhance radiography workforce retention in Nigeria.

Study Limitations

This study was limited by its single-institution design, moderate response rate (56.0%), and

potential self-selection bias associated with voluntary online participation. Furthermore, the questionnaire's reliability was not formally assessed, and the cross-sectional design captured migration intentions rather than actual migration behaviour. These limitations may affect the generalisability and interpretation of the findings.

CONCLUSION

This study revealed a high prevalence of migration intentions among clinical radiography students, primarily driven by professional development opportunities, better remuneration, improved working conditions, and quality of life. Qatar and the United Kingdom were the most preferred destinations. However, most respondents expressed willingness to remain in Nigeria if career prospects and remuneration improved. These findings highlight the need for targeted strategies to strengthen professional development, improve working conditions, and enhance radiography workforce retention in Nigeria.

Recommendations

Based on the findings of this study, the following measures are recommended for government and healthcare institutions:

1. Improve remuneration and incentive structures.
2. Strengthen career development pathways.
3. Improve working conditions and infrastructure.
4. Introduce targeted workforce retention policies.

Conflict of Interest: The authors declare no conflicts of interest.

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