

# Motivating Factors Influencing Radiographers to Undertake Postgraduate Studies: Qualitative Systematic Review

Oswald Bwanga <sup>1\*</sup>, Ncheebe Sindaza <sup>2</sup>

<sup>1</sup> Midlands University Hospital Tullamore, Radiology Department, Co. Offaly, Ireland

<sup>2</sup> Cancer Diseases Hospital and Levy Mwanawasa Medical University, Zambia

\* **Corresponding Author:** Oswald Bwanga, Midlands University Hospital Tullamore, Radiology Department, Co. Offaly, Ireland.

E-mail: [o.bwanga@yahoo.com](mailto:o.bwanga@yahoo.com)

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## Abstract

**Introduction:** Postgraduate education assists in meeting the specialisation of radiographers in different imaging modalities, thereby improving the quality of imaging services. Studies have been conducted on the motivating factors influencing radiographers to undertake postgraduate studies. However, there has been no published review to draw together the findings of such studies. This would provide evidence for future postgraduate course planning, delivery, and evaluation. The aim of this study was to systematically review the primary research studies on the motivating factors influencing radiographers to undertake postgraduate studies.

**Methods:** A qualitative systematic review was conducted guided by the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) guidelines. The literature search was conducted from April to September 2022 in two databases: PubMed/MEDLINE, and ScienceDirect, as well as other sources. Studies were assessed for quality, data was extracted and re-interpreted using framework analysis.

**Results:** Seven studies were identified and included in this review. This review found that both intrinsic and extrinsic factors influenced radiographers to undertake postgraduate studies. Four motivating intrinsic factors were identified: personal desire for new knowledge and managerial positions, pre-requisite for the doctorate programme, and job and professional satisfaction. On the other hand, four motivating extrinsic factors were also identified: availability and flexibility of postgraduate courses, specialisation, continuous professional development, and promotion and remuneration.

**Conclusion:** The overall results of this review show that radiographers were motivated to pursue postgraduate studies. The findings will assist educators to understand the personal drivers for radiographers wanting to embark on post-graduate studies.

**Keywords:** Extrinsic Factors, Motivation, Postgraduate, Radiographer, Intrinsic Factors

## Introduction

The United Kingdom (UK), the United States of America (USA), and Australia played a major role in the development of education and training in radiography. The Society of Radiographers in the UK, the American Society of Radiologic Technologists (ASRT), and the Radiographers Society of Australia (RSA) were all set up in the early 1920s with one of their objectives to provide formal radiography education and training.<sup>1-4</sup> In the 1930s, the Society of Radiographers of the UK also established a branch in South Africa to oversee the formal education and training of radiographers in that country and surrounding areas.<sup>5</sup> Before the foundation of these radiography societies, no formal training had been provided for personnel who used to operate X-ray machines.<sup>5</sup> In the early days, the main qualification

offered was the diploma in radiography which was later upgraded to a bachelor's degree in radiography due to changing needs of healthcare.<sup>2,5,6,7</sup> This move and the discovery of different imaging modalities such as ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI) led to the introduction of postgraduate courses.

Globally, radiography has developed, and the training curricula are guided by national regulatory requirements and service needs.<sup>8</sup> The review of global literature found three main providers of radiography education and training programmes: universities, technical institutes, and vocational colleges.<sup>8-12</sup> International research conducted by McNulty and others<sup>8</sup> found two types of undergraduate programmes: a diploma and a

degree in radiography. The review of the literature also found that most countries follow the UK education model for postgraduate courses at four levels: postgraduate certificates, postgraduate diplomas, master degrees, and doctoral degrees.<sup>8,10,11</sup> The postgraduate courses include different fields of medical imaging: US, image interpretation and reporting, CT, nuclear medicine, MRI, mammography, and Dual-energy X-ray absorptiometry (DEXA). Other supporting courses include clinical education, health professions education, radiation protection, information technology, and research.

In view of the above, the scope of practice of radiographers has also developed in correlation with national needs. Three notable changes to the practice of radiography in the UK were the introduction of a commentary reporting system to aid prompt diagnosis,<sup>13</sup> the introduction of advanced practice<sup>14</sup> and consultant radiographers.<sup>15,16</sup> This change in radiography practice is spreading globally due to an increase in demand for medical imaging services and the shortage of radiologists in most countries.<sup>16,17</sup> However, the main challenges facing some African and Asian countries are a lack of postgraduate courses in specialised medical imaging and legislation that limits radiographers to the traditional role of producing radiographic images.<sup>9-12,17,18</sup>

Motivation and the education process have a deep connection as they encourage learners in reaching their learning goals.<sup>17,19</sup> Gopalan and others<sup>19</sup> define motivation as the force that simulates people to accomplish their goals. Motivation is divided into intrinsic and extrinsic factors.<sup>17,19</sup> In the context of this review, intrinsic factors refer to inner personal desires that encourage radiographers to undertake postgraduate studies that originate from within an individual.<sup>17,19</sup> Intrinsic factors relate to humanistic educational theories which encourage learners to have personal involvement in their own learning.<sup>20</sup> Examples of intrinsic factors to learning include the desire for personal and professional development, and the personal desire to take up new responsibilities such as image interpretation and reporting. On the other hand, extrinsic factors are external forces that influence the decision of radiographers to pursue postgraduate studies.<sup>17,19</sup> Extrinsic factors can be linked to behaviourism educational theories where a learner is influenced by the external environment.<sup>20</sup> Examples of

extrinsic factors in learning include the availability of scholarships, availability of local education and training programmes, promotion, and increases in salary.

Primary research studies have been conducted in radiography on the motivating factors influencing radiographers to undertake postgraduate studies. Therefore, the aim of this study is to systematically review the primary research studies on this topic. The findings of this review have provided evidence of the drivers for radiographers wanting to embark on postgraduate studies. This can help educators to improve the enrolment and quality of postgraduate education and training in specialised fields of medical imaging.

## Materials and Methods

### Study Design

This study used an interpretative review of the qualitative research approach which focused on the re-interpretation of the included primary research studies.<sup>21</sup> The qualitative approach was chosen to better understand the motivating factors influencing radiographers to undertake postgraduate studies.<sup>22,23</sup> This qualitative systematic review was guided by the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) guidelines which involved developing a review question that was then answered by the comprehensive and systematic identification, synthesis, and analysis of relevant primary research studies.<sup>22,23</sup> The review question was:

*“What are the motivating factors influencing radiographers to undertake postgraduate studies?”*

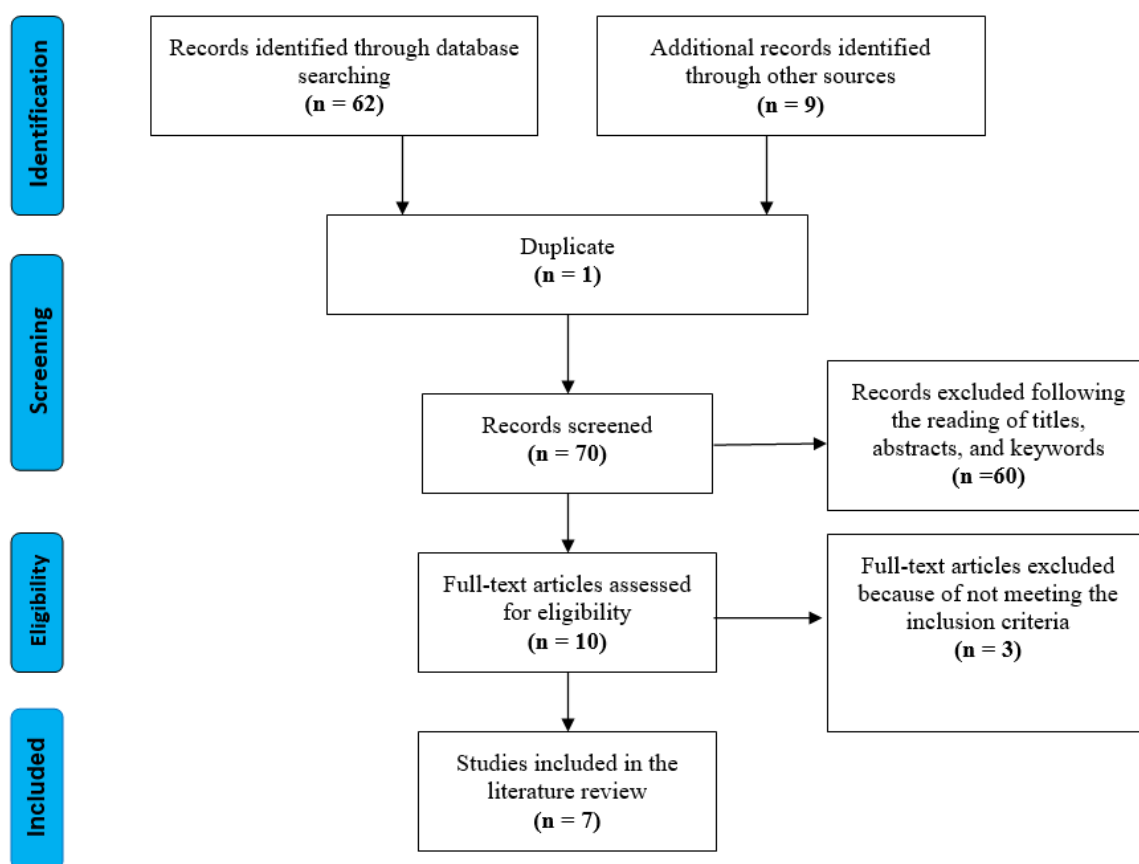
### Literature Search and Selection of Relevant Studies

A thorough literature search was carried out from April to September 2022, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.<sup>24</sup> PubMed/MEDLINE and ScienceDirect electronic databases were searched using keywords: “*motivating factors*”, “*radiography*”, “*medical imaging*”, “*postgraduate studies or courses*”, and “*radiographers*”. The electronic database search was expanded by hand-searching of medical imaging journals: South African Radiographer, Journal of Radiography and Radiation Sciences (Nigeria), Radiography Journal (UK), and Journal of Medical Radiation Sciences (Australia), author searching,

reference lists, and grey literature. Additional searches were undertaken to identify studies that might have been missed through an electronic search.<sup>21,22</sup> The inclusion criteria were all primary research studies on the motivating factors influencing radiographers to undertake postgraduate studies and published in English. There was no publication date or research design restrictions during the searches to identify as many primary research studies as possible.

The literature search strategy produced a total of 71 articles [databases (N = 62) and other sources (N = 9)]. There was one duplicate study.<sup>18</sup> The remaining 70

articles were screened for their titles, abstracts, and keywords, and 60 articles were further excluded because these studies did not focus on motivating factors influencing radiographers to pursue postgraduate studies. The reviewer obtained and read the full-text version of the remaining articles (N = 10) for the second inclusion or exclusion decision. Three studies<sup>6,25,26</sup> were excluded because they did not meet the inclusion criteria. Finally, seven studies were included in this review (Table 2). Figure 1 shows the literature search and selection process conducted for this study.



**Figure 1.** Showing the Literature Search and Selection Process of Studies

### Critical Appraisal

The reviewers used the JBI checklist for qualitative studies<sup>27</sup> to assess the quality of the included seven research studies independently. Any differences in the quality assessment were resolved by mutual agreement. The scoring of the checklist was set by both reviewers during the planning stage of this review. The study was rated high when it met at least a score of 7, medium with a score of 6 to 4, and low with a score of 3 or less. The reviewers scored 1 if the answer is “Yes” and 0 for

“Unclear” and “No”. Table 1 shows the outcome of the critical approval process for eligible research studies. All studies scored high and were included in this study.

### Data Management and Analysis

Seven studies were identified and included in this review and their characteristics are shown in Table 2. Data management involved extracting data using a data extraction form in preparation for the subsequent analysis.<sup>21,22</sup> The data extracted include the author and

**Table 1.** Critical Appraisal Process for Eligible Research Studies (N = 7)

Statement	Study Number						
	1	2	3	4	5	6	7
Is there congruity between the stated philosophical perspective and the research methodology?	1	1	0	1	1	0	1
Is there congruity between the research methodology and the research question or objectives?	1	1	1	1	1	1	1
Is there congruity between the research methodology and the methods used to collect data?	1	1	1	1	1	1	1
Is there congruity between the research methodology and the representation and analysis of data?	1	1	1	1	1	1	1
Is there congruity between the research methodology and the interpretation of results?	1	1	1	1	1	1	1
Is there a statement locating the researcher culturally or theoretically?	0	0	0	0	0	1	0
Is the influence of the researcher on the research, and vice-versa, addressed?	1	1	1	1	1	1	1
Are participants, and their voices, adequately represented?	1	1	1	1	1	1	1
Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	1	0	0	1	1	1	1
Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	1	1	1	1	1	1	1
<b>Overall appraisal for each study</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>

\* Study No: 1 Thingnes and Lewis; 2 for Du Plessis et al.; 3 for Ugwu et al.; 4 for Mubuuke and Pope; 5 for Sathyathas et al.; 6 for Mohabir, and 7 for Ohemeng et al.

**Table 2.** Research Studies Included in the Systematic Review (N = 7)

No	Author(s)	Year	Title	Study design and data collection method (s)	Country
1	Thingnes and Lewis <sup>28</sup>	2011	Radiographers’ experiences on learning arenas, learning needs and lifelong learning in the radiography profession	Qualitative and interviews	Norway
2	Du Plessis et al., <sup>10</sup>	2012	A postgraduate qualification in the specialisation fields of diagnostic radiography: a needs assessment	Mixed methods and Questionnaire/ interviews	South Africa
3	Ugwu et al., <sup>29</sup>	2012	Attitudes and barriers to postgraduate education among radiographers in South-Eastern Nigeria	Quantitative and questionnaire	Nigeria
4	Mubuuke and Pope <sup>17</sup>	2015	Factors that influence radiographers’ decisions to pursue postgraduate education: an exploratory qualitative study	Qualitative and interviews	UK
5	Sathyathas et al., <sup>12</sup>	2016	A qualitative evaluation on learning experiences and perceptions on MSc in Medical Physics among radiography and radiotherapy graduates	Qualitative and interviews	Sri Lanka
6	Mohabir <sup>30</sup>	2019	Factors influencing radiographers’ decision making in relation to postgraduate education	Qualitative and interviews	South Africa
7	Ohemeng et al <sup>18</sup>	2022	Assessment of attitudes and barriers of Ghanaian radiographers towards postgraduate radiography education	Mixed methods and a questionnaire containing closed and open-ended questions	Ghana

**Table 3.** Motivational Factors Influencing Radiographers to Undertake Postgraduate Studies

Themes	Sub-Themes
<b>Theme 1:</b> Motivating intrinsic factors influencing radiographers to undertake postgraduate studies	<ul style="list-style-type: none"> <li>• Personal desire for new knowledge</li> <li>• Personal desire for the managerial position</li> <li>• Academic career and pre-requisite for the doctorate programme</li> <li>• Job and professional satisfaction</li> </ul>
<b>Theme 2:</b> Motivating extrinsic factors influencing radiographers to undertake postgraduate studies	<ul style="list-style-type: none"> <li>• Availability and flexibility of postgraduate courses</li> <li>• Specialisation in different medical imaging and taking up new roles</li> <li>• Continuous professional development (CPD) learning activities</li> <li>• Promotion and remuneration</li> </ul>

year of publication, country of origin, aim and title of the study, study design and data collection methods, data management and analysis, participants’ quotes (for qualitative or mixed methods research), and main findings, and suggestions or recommendations. For quantitative research studies, motivating factors

influencing radiographers to undertake postgraduate studies were identified from the result and discussion sections of the articles.

A framework analysis was used to analyse the data extracted from seven (7) included primary research studies. The Intrinsic and Extrinsic Motivation Theory

was the framework identified from the literature for analysing motivating factors influencing radiographers to undertake postgraduate studies.<sup>19</sup> Similar codes and sub-themes identified during data analysis were grouped under the intrinsic and extrinsic factors (Table 3).

## Results

Following data analysis, eight sub-themes were developed under the two priori themes of intrinsic and extrinsic motivating factors (Table 3).

### Theme 1: Motivating Intrinsic Factors Influencing Radiographers to Undertake Postgraduate Studies

This theme had four sub-themes: personal desire for new knowledge, personal desire for the managerial position, academic career and pre-requisite for the doctorate programme, and job and professional satisfaction.

#### *Sub-theme 1: Personal Desire for New Knowledge*

Half of the reviewed studies reported that radiographers pursued postgraduate studies for personal development through the acquisition of new knowledge. Having a postgraduate qualification was reported by radiographers as having achieved an individual goal and resulted in personal satisfaction. This is best expressed in the following three extracts.

*“There is no real incentive to doing masters other than personal achievement.”*<sup>29</sup>

*“I chose this MSc for my personal development and not to become a medical physicist.”*<sup>12</sup>

*“I did my qualifications for personal satisfaction.”*<sup>30</sup>

It was evident that some radiographers undertook any postgraduate course solely with the desire to be awarded a higher qualification. For example, in a study by Sathyathas et al.,<sup>12</sup> radiographers studied a master’s degree in medical physics which was not related to radiography.

#### *Sub-theme 2: Personal Desire for the Managerial Position*

Two studies included in this review identified the personal desire for a managerial position as one of the internal factors that influenced radiographers to undertake postgraduate studies. Radiology departments are mostly headed by radiologists who are medical doctors and may not better understand the challenges radiographers face being in a different profession.<sup>29</sup> For this reason, radiographers enrol in postgraduate

courses with the motive of taking up a managerial position: *“I want to take on a managerial role. Only people with higher qualifications are considered for senior positions”*.<sup>17</sup> Another radiographer added that: *“higher qualification opens new opportunities such as managerial positions.”*<sup>18</sup>

#### *Sub-theme 3: Academic Career and Pre-requisite for the Doctorate Programme*

In this review, it was found that some radiographers had a personal desire to go into academia. This was reported as an internally motivating factor for undertaking postgraduate studies as illustrated by one radiographer who said:

*“I think my ideal goal would be to go into lecturing. If I want to do lecturing, I must do a postgraduate course.”*<sup>30</sup>

Other radiographers had personal ambitions to study for a doctorate programme and enrolled in master’s courses to acquire a postgraduate qualification which is an entry requirement for a Doctor of Philosophy (PhD):

*“I have planned to follow a PhD related to one of my imaging modalities.”*<sup>12</sup>

#### *Sub-theme 4: Job and Professional Satisfaction*

In one study, radiographers reported job and professional satisfaction as internal factors influencing them to enrol in a postgraduate course. This was expressed by one radiographer who stated that:

*“Although radiography was exciting for me at first, it became empty later and I was not satisfied with the routine work I was doing although I was getting a salary. So, I applied for a postgraduate course to get new skills and make it more interesting.”*<sup>17</sup>

### Theme 2: Motivating Extrinsic Factors Influencing Radiographers to Undertake Postgraduate Studies

This theme also had four sub-themes: availability and flexibility of postgraduate courses, specialisation in different medical imaging modalities and taking up new roles, continuous professional development (CPD) learning activities, and promotion and remuneration.

#### *Sub-theme 1: Availability and Flexibility of Postgraduate Courses*

The availability of local postgraduate courses was

one of the external factors that influenced radiographers for undertaking higher qualifications. This was echoed by one radiographer who said:

*“I wanted to do a master’s degree in radiography long ago, but such programmes are not available at home. So, when I got a chance to come to the UK, I decided to start this master’s programme.”*<sup>12</sup>

Another influencing factor was the distance between the workplace and higher education institutions (HEI): *“This university is much closer to my working place. Since I have no university preference, I selected this university to enrol for my MSc.”*<sup>12</sup>

Some radiographers also took up postgraduate courses because of the availability of a scholarship despite not being interested in the course or not directly related to radiography, such as medical physics.<sup>12,17</sup> Furthermore, flexibility in the delivery of the course was another factor guiding radiographers in enrolling for a postgraduate qualification.<sup>10,17,29</sup> Blended learning assisted radiographers in completing their studies while being with their families and working.

### **Sub-theme 2: Specialisation in Different Medical Imaging and Taking up New Roles**

Three of the included studies in this review identified the rapidly developing and changing radiography profession as one of the external factors that influenced radiographers for undertaking higher qualifications. These changes are initiated by the availability of different medical imaging modalities which require radiographers to specialise in an area of interest and need.<sup>10</sup> Two radiographers had this to say:

*“A radiographer needs a postgraduate qualification to specialise in one area to be in control.”*<sup>28</sup>

*“The dynamics in radiography are changing fast and require specialisation and postgraduate training to meet the trend.”*<sup>18</sup>

The other external factors that influenced radiographers for enrolling in postgraduate studies are the increase in demand for medical imaging examinations and a shortage of radiologists. Globally, radiographers are taking up new roles that were previously within the domain of radiologists such as image interpretation and reporting. One radiographer said:

*“Currently, radiographers are being encouraged to take on film reporting, so I almost had no choice but to pursue a postgraduate course to get these skills.”*<sup>17</sup>

This review found that both specialisation and role

extension in radiography requires acquiring new knowledge and skills through postgraduate education and training.

### **Sub-theme 3: Continuous Professional Development (CPD) Learning Activities**

The other external factor that influenced radiographers for undertaking higher qualifications was to help them stay abreast with the rapidly developing and changing medical imaging technologies such as digital radiography and picture archiving and communication system (PACS).<sup>16,28,29</sup> The other reason was to meet the requirement for mandatory CPD by professional regulatory bodies. This was best illustrated in the following two extracts:

*“I see doing my postgraduate courses as CPD, which is needed by our professional council if I am to maintain my practicing license.”*<sup>17</sup>

*“I enrolled in this MSc to acquire a postgraduate qualification that is required for CPD requirements.”*<sup>12</sup>

### **Sub-theme 4: Promotion and Remuneration**

Five of the studies included in this review found promotion and increased remuneration as the external factors that influenced radiographers for undertaking postgraduate studies. Higher qualification results in promotion opportunities and better remuneration.<sup>10,29</sup> This is best illustrated in the following three extracts:

*“In my workplace, you only get promoted and hence get a salary increment after you get a higher qualification.”*<sup>17</sup>

*“I enrolled in this MSc for improvement remuneration.”*<sup>12</sup>

*“You need to have a reason to do a master’s degree. If my employer told me to do a master’s degree and they going to pay me x amount, compared to what I am getting now, that will be a big motivation.”*<sup>30</sup>

## **Discussion**

The aim of this study was to review the primary research studies on the motivating factors influencing radiographers to undertake postgraduate studies. The review and discussion are guided by the Intrinsic and Extrinsic Motivation Theory.<sup>19</sup>

### **Motivating Intrinsic Factors Influencing Radiographers to Undertake Postgraduate Studies**

This review found that the acquisition of new

knowledge resulted in personal achievement and satisfaction. This was revealed as one of the motivating intrinsic factors that influenced radiographers to enrol for postgraduate studies. Some radiographers pursued a master's in medical physics for the sake of having a higher qualification even though the programme was not directly related to radiography.<sup>12</sup> In addition, some radiographers pursued medical physics because the local higher educational institutions did not offer postgraduate medical imaging courses. This is a true reflection of radiographers where some undertake master's in general radiography as opposed to pursuing one of their preferred specialised medical imaging courses, such as US, CT, MRI, DEXA, nuclear medicine, or image interpretation if these courses were available in their countries.<sup>10</sup>

Another intrinsic factor that influenced radiographers to undertake postgraduate studies identified in this review was a personal desire for a managerial position. Radiography has been considered semi-professional because of the over-dependence on radiologists and medical practitioners for leadership, research, and consultancy services.<sup>31</sup> In the UK, this has changed due to having several radiographers with higher qualifications and changes in policy on management structures. In 2004, a policy was established in the UK for developing non-medical consultant positions such as consultant radiographers.<sup>15,16</sup> One of the roles of a consultant radiographer is to provide leadership and consultancy to other radiographers.<sup>15,16</sup> Other countries may consider the establishment of consultant radiographers. Although radiography managers provide management roles, most radiology departments are headed by radiologists who may not fully understand the challenges radiographers are facing being medical doctors.<sup>29</sup> To develop the radiography profession, radiographers should have the desire for managerial positions therefore not limiting themselves to the management of the radiology department, but the hospital and Ministry of Health (MOH) management positions as well.

In this review, job and professional satisfaction were other intrinsic factors that influenced radiographers to undertake postgraduate education and training. This finding was also identified in a nursing study carried out by Ng and others<sup>32</sup> which found job and professional satisfaction as one of the factors which affected registered nurses to pursue postgraduate

education. However, several studies conducted in radiography have reported that job and professional satisfaction is multi-factorial which does not only depend on having a higher qualification but includes other factors such as remuneration, working conditions, functional status of medical imaging equipment, and professional support.<sup>33-35</sup> In other words, job satisfaction can be considered as an overall feeling about the job.<sup>32</sup> Therefore, radiographers should bear in mind when considering applying for postgraduate courses that attaining a higher qualification only will not lead to job and professional satisfaction.

### **Motivating Extrinsic Factors Influencing Radiographers to Undertake Postgraduate Studies**

This review found the availability of local postgraduate courses as one of the extrinsic factors that influenced radiographers for undertaking postgraduate education and training. However, most African countries are lacking postgraduate medical imaging courses in specialised areas such as CT, MRI, DEXA, nuclear medicine, and image interpretation.<sup>10,11,17</sup> Some radiographers from Africa end up studying in Europe which is costly.<sup>17</sup> Globally, there is a necessity to develop local specialised postgraduate courses to increase the number of applicant vacancies, meet the increasing number of different imaging modalities and improve service delivery. The other external factor under this theme was flexibility in the delivery of postgraduate courses through blended learning (BL). Vavasseur and others<sup>36</sup> define blended learning (BL) as an educational strategy that integrates traditional face-to-face academic sessions with e-learning to support and improve meaningful interactions between students, teachers, and training resources. This review found that radiographers preferred blended learning to full-time face-to-face instruction because most of them were permanently employed and depended on their income and had family responsibilities.

This review further found specialisation in different medical imaging modalities as another extrinsic factor that influenced radiographers to undertake postgraduate studies. There are numerous positive outcomes associated with specialisation in healthcare: specialists routinely manage patients with complex conditions, higher patient satisfaction, and more effective communication, and collaboration with other providers.<sup>37,38</sup> In the context of this review, all of these results in improved

medical imaging services delivery. The other extrinsic factor related to specialisation found in this review was radiographers taking up new roles such as intravenous (IV) cannulation and administration of contrast media, and image reporting. Du Plessis and others<sup>10</sup> pointed out that it is only through postgraduate education and specialisation in different medical imaging modalities that radiographers can be prepared to take up advanced roles and expand the scope of their practice. This review found that having higher qualification and specialisation results in higher chances of being promoted to management or specialist positions with a corresponding increased salary.

It was also established in this review that CPD is another extrinsic factor that influenced radiographers to enrol in postgraduate courses to keep updated with knowledge and skills. The College of Radiographers<sup>39</sup> defines continuing professional development (CPD) as an ongoing professional activity in which a practitioner identifies, undertakes, and evaluates learning appropriate to the maintenance and development of the highest standards of practice within an evolving scope of practice. Recently, it is important for radiographers to undertake CPD learning activities to acquire new knowledge in different imaging modalities such as CT, US, MRI, DEXA, digital radiography, image interpretation and reporting, and clinical education.<sup>40</sup> In addition, most health professional regulators globally such as the Health and Care Professions Council (HCPC), the Health Professions Council of South Africa (HPCSA), the Health Professions Council of Zambia (HPCZ), and the Australian Health Professionals Registration Authority (AHPRA) have made mandatory CPD for their registrants. This means that radiographers can only renew their practicing licenses upon the production of evidence of undertaking CPD learning activities.

### Limitations of the Study

Three main limitations were noted. Firstly, there were only seven studies included in this review conducted in six countries from three continents: Europe, Asia, and Africa (Table 2). Therefore, the findings of this review might not be truly generalisable to the global radiography population given the limited number of studies that were found. Secondly, the findings provided in this review are only as reliable as the

findings reported in each of the included studies.<sup>21,22</sup> Thirdly, quantitative studies were included due to limited qualitative studies on this subject. This could have affected the findings because quantitative research studies do not provide a deeper understanding of the problem under investigation.<sup>22,23</sup> Despite these limitations, the findings of this review provide a good understanding of the motivating factors influencing radiographers to undertake postgraduate studies.

### Conclusion

This literature review identified the main intrinsic and extrinsic motivating factors that influence radiographers wanting to embark on post-graduate studies. The implication of the finding of this study is that educators should always be mindful of both intrinsic and extrinsic motivating factors that influence radiographers when planning for future postgraduate courses in specialised fields of medical imaging. Employers also should have strategies to support radiographers for postgraduate studies to assist in meeting the emerging specialisation in medical imaging which improves the quality of healthcare delivery.

### Conflict of Interest

The authors declare no conflicts of interest.

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