



Radiographers as doctors: A profile of UK doctoral achievement



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ABSTRACT

Introduction: Radiography aspires to be a research active profession, but there is limited information regarding the number of individuals with, or studying for, a doctoral award. This study aims to profile UK doctoral radiographers; including their chosen award, approach and employment status.

Method: This was a prospective cohort study utilising an electronic survey. No formal database of doctoral radiographers existed therefore a snowball sampling method was adopted. The study sample was radiographers (diagnostic and therapeutic) based in the UK who were registered with the Health and Care Professions Council (HCPC) and who held, or were studying for, a doctoral award.

Results: A total of 90 unique responses were received within the timescale. The respondents comprised 58 females (64.4%) and the majority were diagnostic radiographers ($n = 71/90$; 78.9%). The traditional PhD was the most common award, although increasing numbers were pursuing Education or Professional Doctorates. An overall increase in doctoral studies is observed over time, but was greatest amongst those working in academic institutions, with 63.3% of respondents ($n = 57/90$) working solely within a university, and a further 10% employed in a clinical–academic role ($n = 9/90$).

Conclusion: This study has demonstrated that radiography is emerging as a research active profession, with increasing numbers of radiographers engaged in study at a doctoral level. This should provide a platform for the future development of academic and clinical research.

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Introduction

Since the transition of radiographer training into higher education in the early 1990s, the profession has strived to develop its academic and research identity. Incremental steps have been taken to embed research within academic and clinical roles but a perceived apathy and resistance to undertaking research has been noted.^{1–3} Although there are some very research active radiographers the profession has struggled to establish a research culture in practice. Measuring the success of research strategies is not straightforward but traditional metrics are valuable and include publication productivity and the number of doctoral awards. A number of bibliometric studies have confirmed that radiography publication activity is increasing but that the majority of articles originate from a relatively small number of authors and centres.^{3–5} To date there is limited knowledge of doctoral

achievement within the radiography profession; Davies and Rolfe⁶ suggested that nursing had been slow to pursue doctoral status, but it is unknown whether this is replicated in the allied health professions. Previous studies have shown greater academic advancement amongst radiographers in Australia compared to the United Kingdom (UK),⁷ yet the reasons for this are unclear. In addition, a previous survey of radiographers in the United States (US) identified that 0.3% held a doctoral award; however, this study also confirmed that multiple barriers to undertaking research existed.⁸

In 2015 a new 5-year strategy for research⁹ was launched by the UK professional body, the Society and College of Radiographers (SCoR), with increasingly ambitious expectations. One factor likely to stimulate debate is that 1% of the radiography workforce will be expected to hold, or be working towards, a doctoral level award. Importantly, the strategy proposes that this should include *all* those in consultant radiographer roles. Although there is an understanding that the academic community is expected to undertake scholarly activity and increasingly progress their research skills to such a level,^{7,10} there is ongoing debate regarding the relevance of doctoral study for clinicians.^{11–15}

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The Doctor of Philosophy (PhD) award is synonymous with the term ‘doctoral’; however a number of alternative routes are available both in the UK and internationally, including the PhD by published work, the Doctorate in Education (EdD) and Professional, or Clinical, Doctorate (DProf or DClin). Indeed, the professional doctorate has been suggested as a more appropriate route for those in leadership roles, whether in academia or clinical practice.¹²

This article presents the results of a study aiming to profile UK doctoral radiographers; including their chosen award, approach and employment status. This will add to the international debate regarding the research preparedness of the profession and how future capacity can be influenced.

Method

This was a prospective cohort study utilising an electronic survey tool (Bristol Online Survey®, Bristol, UK). The survey comprised of a number of closed and open questions related to qualification route and funding, doctoral status, employment and basic demographic data. An initial pilot study using a small cohort of radiographers with, or registered for, a range of doctoral award types resulted in minor amendments to the questions.

No formal database of doctoral radiographers existed therefore a snowball sampling method was adopted. This utilised direct contact with all Heads of Radiography Education in universities providing undergraduate and/or postgraduate courses for diagnostic and/or therapeutic radiographers. Additional recruitment was sought through a notice in the monthly radiographer professional journal (Synergy News) and via social media. All mailings provided a link to the survey and an introduction to the purpose of the research. The survey remained open for 6 weeks in December 2015 and January 2016.

The study sample was radiographers (diagnostic and therapeutic) based in the UK who were registered with the Health and Care Professions Council (HCPC) and who held, or were studying for, a doctoral award. HCPC registrants were chosen as the study sought to identify those who were able to practice, and, therefore, influence radiography focused research. International students who were not registered to practice in the UK were excluded from the study. Prospective participants were provided with a contact email address for a member of the study team if there was any uncertainty about eligibility.

The survey sought to collect anonymised data, with only basic demographic information to assist in generating a profile. UK Health Research Authority (HRA) processes¹⁶ were followed and the study did not require ethical approval. Respondents’ consent was considered to be implied by reading the study explanatory introduction and by completion of the survey.

The response data were downloaded into Excel® (Microsoft Corporation, USA) to allow for descriptive analysis. Further

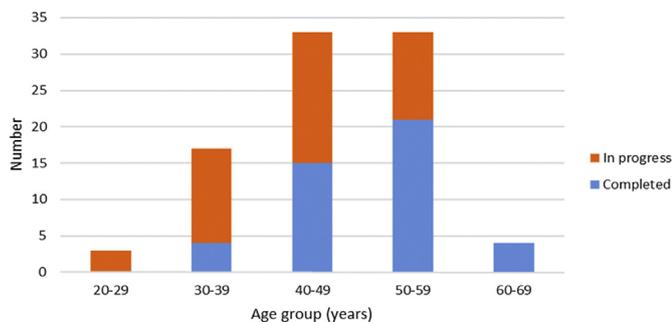


Figure 1. Age categories of the respondents by doctoral status.

Table 1
Geographic location of doctoral radiographers.

Geographic region	Completed No. (%)	In progress No. (%)	Total No. (%)
England	37 (84.1)	39 (84.8)	76 (84.4)
East	5	11	16
London	4	6	10
North	19	9	28
South	9	13	22
Northern Ireland	3 (6.8)	2 (4.3)	5 (5.6)
Scotland	3 (6.8)	2 (4.3)	5(5.6)
Wales	1 (2.3)	3 (6.5)	4 (4.4)
Total	44	46	90

Table 2
Doctoral route undertaken by radiographers.

	Completed No. (%)	In progress No. (%)	Total No. (%)
EdD	5 (11.4)	10 (21.7)	15 (16.7)
PhD	26 (59.1)	21 (45.7)	47 (52.2)
PhD by published work	5 (11.4)	3 (6.5)	8 (8.9)
Professional doctorate	8 (18.2)	12 (26.1)	20 (22.2)
Total	44	46	90

statistical analysis was performed using the Social Science Statistics website (soccstatistics.com).

Results

A total of 90 unique responses were received within the time-scale. The respondents comprised 58 females (64.4%) and the majority were diagnostic radiographers (n = 71/90; 78.9%). Ages of the respondents varied between those who had completed a doctoral award and those whose studies were in progress (Fig. 1). Over half of those with a doctorate were over the age of 50 (n = 25/44; 56.8%).

The highest numbers of doctoral radiographers were based in England; further analysis confirmed differences across the English regions, where National Health Service (NHS) boundaries were used (Table 1).

The traditional PhD was the most common award, both with those having already completed and those in progress, although increasing numbers were pursuing the EdD and professional doctorates (Table 2). Seventy-seven (85.6%) undertook, or were undertaking, their studies part time, only the traditional PhD award had been undertaken on a full time basis.

There were different research approaches taken in the doctoral studies and these varied between the diagnostic and therapeutic branches of the radiography profession (Table 3). Therapeutic radiographers were statistically more likely to be undertaking qualitative research than their diagnostic colleagues (z = 2.1619; p = 0.0308).

The greatest numbers of graduations are expected to be within 2016, however an overall increase in doctoral studies is observed over time (Fig. 2).

Table 3
Research approach taken by doctoral radiographers by branch.

	Diagnostic No. (%)	Therapeutic No. (%)	Total No. (%)
Mixed methods	24 (33.8)	5 (26.3)	29 (32.2)
Qualitative	22 (31.0)	11 (57.9)	33 (36.7)
Quantitative	25 (35.2)	3 (15.8)	28 (31.1)
Total	71	19	90

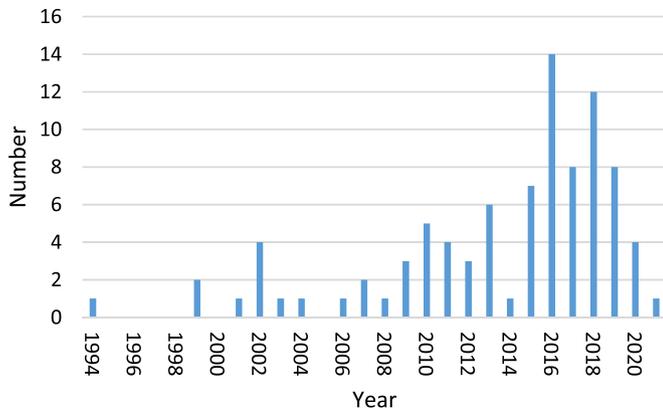


Figure 2. Year of doctoral award (or expected).

Doctoral study was greatest amongst those working in academic institutions, with 63.3% of respondents ($n = 57/90$) working solely within a university, and a further 10% employed in a clinical–academic role ($n = 9/90$). Of the 21 clinical radiographers (in progress and completed), 4 identified their role as consultant radiographer practitioner.

For those who have completed their studies a number had subsequently been employed within higher education (Table 4). This included a move into full time academia or as a joint clinical–academic appointment for over half of the clinical respondents.

Funding for doctoral study was predominately supported by the employer, both in monetary and/or time release terms (Table 5). Respondents identified external funding to include small grants such as the College of Radiographers Industry Partnership Scheme (CoRIPS) or larger awards from charities or government bodies such as the National Institute for Health Research (NIHR) in England or the Research Capacity Building Collaboration (RCBC) in Wales. Importantly, other than one individual undertaking an EdD, only radiographers pursuing the PhD route had secured external research funding.

In terms of the dissemination of the research findings from their doctoral studies almost all radiographers had published articles in peer reviewed journals, with many also presenting the results at national and international conferences (Table 6). It is also interesting to see that many of those still studying are already producing outputs from their research.

In relation to the research activities of the 44 post-doctoral radiographers, 30 (68.2%) had received at least one grant since completing their doctorate. Importantly, 42 described their ongoing commitment to research by involvement in a range of activities including the development of the evidence base through

Table 4
Breakdown of roles for post-doctoral radiographers.

Role at time of study	Post-doctorate role				Total No. (%)
	Academic No. (%)	Clinical No. (%)	Clinical–academic No. (%)	Other No. (%)	
Academic	25 (73.5)	2 (33.3)	1 (33.3)	–	28 (63.6)
Clinical	5 (14.7)	4 (66.7)	2 (66.7)	–	11 (25.0)
Clinical–academic	2 (5.9)	–	–	–	2 (4.5)
Other ^a	2 (5.9)	–	–	1 (100)	3 (6.8)
Total	34	6	3	1	44

^a Includes 2 full time studentships on stipend.

Table 5
Funding of doctoral studies.

Funding	Completed No. (%)	In progress No. (%)	Total No. (%)
Employer	16 (36.4)	26 (56.5)	42 (46.7)
Fee waiver with time release by employer	8 (18.2)	2 (4.3)	10 (11.1)
Funded fellowship/ studentship	11 (25.0)	5 (10.9)	16 (17.8)
Funded research award	1 (2.3)	2 (4.3)	3 (3.3)
Other	2 (4.5)	6 (13.0)	8 (8.9)
Self	6 (13.6)	5 (10.9)	11 (12.2)
Total	44	46	90

national guidance, the commissioning of research, undertaking funded or unfunded research, and acting as journal editor or peer reviewer. They also were contributing to the development of other radiographers' research through mentoring or formal supervision.

Discussion

This study provides a baseline profile for the current doctoral radiographers in the UK, including those who are registered for such an award. It is recognised that there are a number of active researchers who do not hold a doctoral award; however it is important to understand where the current level is situated in order to plan for the expectations of the 2016–21 research strategy.⁹

It is not known whether the responses to this survey represent a complete picture of doctoral practice, however it is likely to represent the majority of UK radiographers engaged with study at this level. Based upon the number of radiographers registered with the HCPC at the time of this study (31,109),¹⁷ the number of doctorally qualified radiographers represents only 0.1% of the profession. This is well below the benchmark identified in the 2010 US survey of 0.3%,⁷ a level which can only be achieved in the UK if those currently enrolled on an award are also included. The number of doctoral radiographers is small, but it is reassuring to see that the number currently engaging in such development has increased. If the SCOR target⁹ is to be achieved another 200 radiographers would need to register for a doctoral award in the next 4 years. It is perhaps too ambitious to consider whether there is the interest, funding and/or supervision to support such rapid expansion. To deliver such an aspiration will need strategic development and investment from universities and individuals. An example of such a programme within a single academic nursing centre in Ireland showed the complexities involved with recruiting additional staff to release researchers as well as the need to be creative with student support, such as International supervisor appointments.¹⁸

The results of this survey validate the previous research of Girot and Albarran¹⁹ which demonstrated radiographers lagging behind other health professions. Their study, undertaken within a single English region, evidenced a smaller number of radiographers with a PhD award in comparison to nurses and many other AHPs. The clinical picture remains equally bleak, with few clinical radiographers engaging with doctoral study, and perhaps research in general. This matches with similar evidence from the 2015 audit of clinical research capacity in UK radiotherapy centres undertaken by Probst et al.²⁰ which identified only one PhD and two DProf students and no staff with a completed award. Although, encouragingly four consultant radiographers were identified in this study as in the 'current' doctoral cohort. Price and Edwards²¹ recognise that a doctorate would enhance a consultant's practice, but conclude that it is perhaps unrealistic and not necessarily a core requirement. Indeed with many consultant radiographers yet to achieve a master's degree and inconsistent application of the expectations laid

Table 6
Outputs from doctoral study.

	Completed No. (%)	In progress No. (%)	Total No. (%)
Peer review publication	36 (81.8)	19 (41.3)	55 (61.1)
Oral presentation at national or international conference	37 (84.1)	23 (50.0)	60 (66.7)
Poster presentation at national or international conference	23 (52.3)	22 (47.8)	45 (50.0)
None	2 (4.5)	10 (21.7)	12 (13.3)
Total respondents	44	46	90

out in the development of such roles, the move to doctoral level for entry or career development may be a way off.^{15,22}

Given the previous literature in the field the overall clinical research capacity was expected to be low, but perhaps the more disappointing is the number of clinical radiographers lost to academia. Clinical–academic posts are not well established within the radiography profession, particularly at a post-doctoral level, despite this being a national research strategy.^{23–25} This study did not seek to identify the drivers for career choices and it is therefore unclear what motivated the move into higher education. Perhaps this was exacerbated by a perceived lack of clinical research opportunities and limited recognition of the broader skills which come with study at this level. Indeed, as Price reflects a doctorate “is not an end in itself but is the starting point of a post-doctoral research career.”²

Whereas the number of clinical respondents was small, the academic community appears to be more engaged, whether as a result of greater expectation within higher education or more opportunity. Indeed, funding may be a contributing factor as the majority received funding from their employer. This appears to confirm the increasing value that universities place on the doctoral education of their staff. There were a small number of radiographers holding externally funded awards, whether research or training based and this perhaps demonstrates actual credible recognition of the profession as research active.

No previous study has explored the variation in doctoral pathways pursued by an individual profession and there is ongoing debate within the health community as to the status and value of the different awards.^{6,26} Whereas the traditional route PhD has the greatest engagement, there were a number of pathways being pursued by radiographers, particularly the current students. The PhD by published work is intended to recognise the outputs and activity of research active individuals, with an emphasis on evidencing the impact of their research. Traditionally, such doctorates are awarded for research already undertaken, with the articles submitted within an overarching thesis and supplemented by a traditional style viva providing the opportunity to defend the work.²⁷ The more novel approach is a prospective PhD by published work as a developmental award able to adapt and respond to changing interests and employer priorities.⁶ This route has the advantage that it meets the needs of the universities in increasing publications and impact (as required by the UK Research Excellence Framework) and an individual's academic development.²⁸ Regrettably, many are only available to those associated with a university,²⁷ and therefore may exclude clinical radiographers unless they can demonstrate collaborative research. Whereas the PhD is often considered as an employer-driven award, the practice context of the EdD or DProf brings different benefits to the individual, university, employer and wider society.²⁹ Lee et al.¹² suggested that the professional doctorate provides better preparation to integrate research findings into both education and practice. Importantly, the

outputs are expected to not only contribute new knowledge to the evidence base but also to make a significant impact in clinical practice.³⁰ As such awards are embedded in (education and clinical) practice they are almost always undertaken part time,²⁸ as evidenced by this current study. The professional (practice) doctorate approach has found favour internationally with the Doctor of Nursing Practice (DN or DNP) award being the entry to advanced practice roles with their composite examinations and criteria.³¹ Although not universally accepted as academically equivalent to the traditional doctoral programmes, they do appear to have been successful in increasing clinically based research and outputs.³¹ Perhaps such a route would bring more credibility to the consultant radiographer role? Importantly for individuals pursuing a career in research, rather than in clinical practice, a professional doctorate is currently considered ineligible for post-doctoral NIHR fellowships.³² This is despite such awards being recommended to prepare clinical–academic nurses.²⁴

In relation to the age of doctoral students the age of the current cohort is younger than those already holding an award. The need to engage individuals in research earlier in their career has been recognised previously.² Although the demographics of this study are still similar to that of nursing doctoral students³³ further research is required to evidence a change in radiographic practice.

The research methods chosen by the different branches is interesting, with therapeutic radiographers more likely to utilise qualitative approaches. This is perhaps due to the more holistic care focus of this aspect of the profession and recognises the more longitudinal interaction that therapeutic radiographers have with patients throughout their treatment journey.

It is encouraging to note that a number of the current doctoral students are presenting and publishing their findings whilst their research is in progress. Of the radiographers who have completed a doctorate 18% had not published their doctoral findings; this is disappointing but not necessarily unexpected as the lead time to publication can be extensive. Reassuringly their findings are being shared through conference presentations and therefore the outputs are being disseminated and shared. However, ongoing research engagement is evident with the postdoctoral radiographers, both in terms of leading research but also, perhaps more importantly, in the development of other novice researchers, whether through formal supervision or informal mentorship. This role is important in the development of research capacity, to prevent isolation³⁴ and improve confidence and capability.²⁰ This is of particular importance in clinical practice, with a previous evaluation of therapeutic radiographers' research capacity demonstrating that only 20% of clinical centres have established mentorship schemes for novice researchers.²⁰

Conclusion

This study has demonstrated that radiography is emerging as a research active profession, with increasing numbers of radiographers engaged in study at a doctoral level. This should provide a platform for the future development of academic and clinical research.

The profession requires leaders who will develop themes and studies relevant to the radiographic body of knowledge, particularly to influence patient delivery and care. This should subsequently inspire and engage a wider group of radiographers in research activity, either through formal or informal groups and/or collaborations.

Conflict of interest statement

BS and RH hold doctoral awards. MH undertook data collection to remove any potential bias.

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