




ORIGINAL ARTICLE

Research interest, experience and confidence of allied health professionals working in medical imaging: a cross-sectional survey

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Abstract

Introduction: There is growing interest in developing research culture and opportunities for allied health professionals working in medical imaging. However, little attention has been given to identifying the research interest and needs of this group relative to the other allied health professions. We aimed to measure self-reported research participation, interest, experience and confidence of allied health professionals working in medical imaging and compare the findings to clinicians working in allied health therapies. **Methods:** A cross-sectional survey of allied health professionals from medical imaging (radiographers, sonographers and nuclear medicine technologists) was conducted. The primary outcome, the Research Spider survey, measures 10 domains of research interest/experience/confidence on a 5-point Likert scale. Results were compared to allied health therapy data. **Results:** Responses were received by 82 medical imaging allied health professionals (65% response rate). Overall, medical imaging professionals rated themselves as having ‘some interest’ and ‘little experience or confidence’ in research. There was no difference in interest, experience and confidence among different imaging professions (interest $P = 0.099$, experience $P = 0.380$, confidence $P = 0.212$) or allied health therapists (interest $P = 0.137$, experience $P = 0.363$, confidence $P = 0.791$). Participants reported greatest interest in finding and reviewing literature and lowest interest in applying for funding. **Conclusion:** There are strong similarities between medical imaging allied health professionals and allied health therapy professionals. Therefore, strategies used to promote research culture in allied health therapy professions could be leveraged to provide opportunities for medical imaging allied health professionals.

Introduction

A strong research culture among health services is fundamental to providing evidence-based care.^{1,2} Research culture is defined as ‘a culture that embraces the expectation that everyday health and social care should be based upon the best available knowledge or research findings rather than custom and practice’.³ A positive research culture is associated with improved

organisational performance including productivity, staff satisfaction and retention, and patient outcomes.⁴ There has been growing interest and investment in building research capacity among allied health professions, including those in medical imaging.⁵

Allied health comprises a broad range of health professionals other than medicine and nursing that promote health and well-being of patients.² Within medical imaging, allied health professions include

radiography, sonography and nuclear medicine. Outside of medical imaging, allied health professions include physiotherapy, occupational therapy, psychology and speech pathology, among others. There is an expectation that all allied health professionals are research literate and engage with research as part of their practice^{5,6} to enable research translation into the clinical environment to enhance patient care.⁴ Some allied health professionals will also be research generators.⁷

While there has been much emphasis on quantifying research skills and experience among allied health professionals such as therapists,⁷⁻⁹ less is known about allied health professionals working in medical imaging. Traditionally, radiographers have not identified with being research generators and have viewed research as separate from clinical practice.¹⁰ As such, engagement in research has previously been described as very low,^{11,12} with most research generated by academics.¹³ As little as 1% of allied health professionals working in medical imaging hold a higher research degree.^{14,15} Common challenges to embedding research into imaging practice are workload pressures and time, access to equipment, organisational culture, lack of incentives and knowledge about research methods and a fear of research itself.¹⁶

A number of strategies have been employed across the allied health professions to enhance research capacity. Successful interventions include establishing training and grant schemes and providing research mentoring and dedicated research positions in health services.^{7,12,17-19} Specific to medical imaging, the implementation of a 'research radiographer' increased research publications almost threefold in one radiology department.¹² 'Pop-up' research centres are another initiative utilised by medical imaging services that have increased traditional research outputs such as journal publications, as well as providing research leadership and networking opportunities within and outside of organisations.²⁰ In response to this evidence, The Victorian Department of Health recently appointed two Research Fellows in two metropolitan health services to build research capacity of allied health professionals working in medical imaging. The fellow appointed to this health service commenced in March 2019, just prior to the current study. This fellow is embedded in the Allied Health Clinical Research Office established in 2007, led by a Professor of Allied Health. The department previously provided support for the allied health therapy professions. Existing initiatives to promote research capacity at the health service include a research training scheme, a quarterly allied health research newsletter, monthly research clinics, an annual research forum, leadership of major externally funded projects, on-site supervision for higher degree students and a consultancy service for allied health professionals

interested in undertaking research. Support was extended to radiographers, sonographers and nuclear medicine technologists through the appointment of the fellow. The study was conducted before implementation of any strategies targeting this group. Given the breadth of potential strategies to enhance research capacity, there is a need to identify what strategies are most appropriate for those working in medical imaging.

An important first step in designing research capacity strategies in medical imaging is to determine their level of interest and engagement in research. Therefore, the aims of this study were to examine the research participation, interest, experience and confidence of allied health professionals working in medical imaging and compare the level of research interest, experience and confidence of allied health professionals in medical imaging with other allied health therapy professionals.

Methods

A quantitative, cross-sectional survey of medical imaging allied health professionals was completed within a large metropolitan public health service between August and October 2019. The results of this study are compared to survey responses from allied health therapy professionals in 2015 from the same health service. The 2015 data with allied health therapy professionals were collected prospectively following full ethics approval (LR87/2015) and has been published previously.⁷ Participants of the current study were eligible if they were allied health professionals working in diagnostic imaging at the health service. The health network does not employ radiation therapists, so they were not included in either study. All participants received written information about the study with consent implied by completion of the returned survey. Full ethics approval for the study, including the planned comparison with 2015 data, was gained from the Eastern Health Human Research Ethics Committee for all procedures in the current study (LR19/077).

Setting and participants

This study was conducted at a large metropolitan health network which provides care for approximately 800,000 people in Melbourne, Australia. It comprises three acute hospitals which are the primary locations of diagnostic imaging services, two sub-acute (rehabilitation) sites, a small regional hospital and several small community-based sites. The health network employed approximately 126 allied health professionals who worked in medical imaging at the time of the study.

The support structure for allied health research at this health network centres around an Allied Health Clinical

Research Office, which provides research support and leadership to allied health professionals in collaboration with a partner University. The office had previously provided research support only to members of the allied health therapy professions (physiotherapy, occupational therapy, speech pathology, dietetics, social work, psychology and podiatry). Expanding the scope of the service to include medical imaging staff coincided with the appointment of an Allied Health Research and Translation Fellow in 2019.

All allied health professionals working in medical imaging (radiography, sonography, nuclear medicine) at the health network were invited to participate. Other health professionals working in medical imaging such as nurses and radiologists were excluded as allied health professionals were the focus of this study. Participants were recruited via their department managers. Managers distributed the survey in paper format or online via survey software (Qualtrics XM, Provo, UT). Allied health medical imaging professionals were invited to complete the survey and return it to their manager who forwarded the surveys to the research team. After 2 weeks, a reminder email was sent to managers as a final reminder to encourage staff to complete the surveys. The process of distributing paper surveys was the same as 2015. An online option for completion of the survey was added to the current study protocol in an attempt to improve response rate.

Outcome measures

The Research Spider tool²¹ was used to assess self-reported research interest, experience and confidence. The survey also included items related to self-reported research participation (categorised as non-participant, participant or training/managing research), post-graduate qualifications and interest and awareness of key initiatives of the allied health clinical research office (e.g. research training programme). A single open-ended question was added to the survey about what activities or resources participants would find useful to increase their research participation.

Each category or 'leg' of the Research Spider is measured using a 5-point Likert Scale from 1 (no interest or experience) to 5 (very interested/experienced). Interest, experience and confidence were rated for each of the following categories: writing a research protocol; using quantitative research methods; publishing research; writing and presenting a research report; analysing and interpreting results; using qualitative research methods; critically reviewing the literature; finding relevant literature; generating research ideas; and applying for research funding.

Basic demographic data including age, gender and discipline were also collected in addition to the Research Spider tool to describe the sample.

Data analysis

Descriptive statistics including proportions, medians and interquartile ranges (IQR) were used to describe research participation, interest, experience and confidence. Differences between responses for the medical imaging and allied health therapy cohorts were tested using the medians test for independent sample and chi-squared test for distributions. Differences between medical imaging disciplines were tested using the Kruskal–Wallis test for independent samples. Friedman's test for correlated samples was applied to test if there were more interest and experience in some categories of the Research Spider tool than others. All analyses were completed in IMP SPSS version 25 (IBM Corp., Armonk, NY).

Results

Of the 126 eligible clinicians from diagnostic imaging, 82 (65%) surveys were completed. The majority of the sample was radiographers (72%), followed by 13 (16%) sonographers and 9 (11%) nuclear medicine technologists. Most participants were female (63%), and 48% were aged 30 years or younger. A greater proportion of males in the medical imaging cohort participated than allied health therapy cohort (35% compared to 12%). Over a third (38%) of participants had post-graduate qualifications, with only 3 (4%) having completed higher degree research qualifications (Table 1).

Research participation

Thirty-one participants (38%) identified as being participants or active participants in research. There was poor awareness of existing allied health research promotion and training initiatives among medical imaging professionals. Compared to allied health therapy clinicians, research awareness and participation was significantly lower for all research initiatives. No participants from medical imaging were enrolled in a higher degree by research at the time of the survey. Workshops were identified by 22 participants (27%) as a potential strategy to increase engagement with research.

Research interest

Overall medical imaging allied health professionals rated their research interest as having 'some research interest' on the research spider tool (median 3, IQR 2 to 4)

Table 1. Characteristics of study participants.

Discipline <i>n</i> (%)	Allied Health Therapy (<i>n</i> = 245)	Medical Imaging (<i>N</i> = 82)	Between-group difference
Discipline, <i>n</i> (%)			
Radiography		59 (72)	
Sonography †		13 (16)	
Nuclear Medicine		9 (11)	
Occupational Therapy	47 (19)		
Physiotherapy	75 (31)		
Speech Pathology	25 (10)		
Dietetics	30 (12)		
Social Work	32 (13)		
Podiatry	14 (6)		
Psychology	15 (6)		
Other	7 (3) ‡	1 (1) §	
Age, <i>n</i> (%)			
20–30 years	86 (35)	39 (48)	
31–40 years	76 (31)	24 (29)	
41–50 years	46 (19)	10 (12)	
> 50 years	37 (15)	9 (11)	$\chi^2(3) = 4.85$, $P = 0.183$
Gender, <i>n</i> (%)			
Female	209 (88)	52 (64)	
Male	29 (12)	29 (35)	$\chi^2(1) = 21.10$, $P \leq 0.001^*$
Self-reported research group, <i>n</i> (%)			
Non-participant	110 (45)	50 (62)	
Participant	98 (40)	25 (30)	
Active/experienced researcher	36 (15)	6 (7)	$\chi^2(1) = 7.35$, $P = 0.025^*$
Post-graduate qualifications, <i>n</i> (%)			
None	134 (55)	51 (62)	
Coursework	97 (40)	28 (33)	
Research	14 (6)	3 (4)	$\chi^2(2) = 1.59$, $P = 0.452$
Enrolled in HDR, <i>n</i> (%)			
Masters Research	1 (0.4)	0 (0)	
PhD	5 (2)	0 (0)	

†Includes only sonographers and not sonographer/radiographers.

‡Other includes exercise physiologists, allied health assistants.

§Other refers to missing data where discipline not specified.

*Percentages do not add to 100 due to missing data.

*Significant difference at $P < 0.05$.

(Fig. 1). There was no difference in interest between different medical imaging professions ($P = 0.099$). A similar score was reported by allied health therapy clinicians (median 3, IQR 2 to 4) ($P = 0.154$). Medical imaging allied health professionals had the highest amount of interest in finding relevant literature and the lowest in applying for research funding. Within the research interest categories, there was a significant difference between the two cohorts in four of the ten

categories (Table 2). Allied health therapists had higher levels of interest when compared to medical imaging in using quantitative methods ($P = 0.018$), critically reviewing literature ($P = 0.030$), finding relevant literature ($P = 0.014$) and generating research ideas ($P = 0.004$).

Research experience

Overall, medical imaging allied health professionals rated their research experience as having 'little research experience' on the research spider tool (median 2, IQR 1 to 3) (Fig. 2). There was no difference in experience between different medical imaging professions ($P = 0.380$). This score is similar to scores rated by allied health therapy clinicians (median 2, IQR 1 to 3) ($P = 0.363$). Within the research experience categories, there was a significant difference between the two cohorts in two of the ten categories (Table 3). Both medical imaging allied health professionals and allied health therapists reported the highest amount of experience in finding relevant literature and the lowest in applying for research funding, but Allied health therapy clinicians reported higher levels of experience than the medical imaging cohort in both categories ($P = 0.010$ and $P = 0.025$, respectively; Table 3).

Research confidence

Overall medical imaging allied health professionals rated themselves as having 'little research confidence' (median 2, IQR 1 to 3; Fig. 3). There was no difference in confidence between different medical imaging professions ($P = 0.212$). Medical imaging allied health professionals had highest levels of research confidence in finding and reviewing literature and the lowest amount of confidence in the applying for researching funding category. There was no difference in confidence between medical imaging and therapy cohorts in any category (Table 4).

Medical imaging allied health professionals had significantly more interest in research than experience and confidence ($P < 0.001$). Research interest and confidence were moderately correlated with their research experience (interest $r = 0.422$, $P < 0.001$; confidence $r = 0.474$, $P < 0.001$). At least 7% of medical imaging allied health professionals were very interested in each of the 10 categories of the research spider (range 7 to 17%). For 7 of the 10 categories, 15% or more were very interested. Very small numbers of medical imaging allied health professionals were very experienced in the different research categories (range 1 to 11%). For 6 of the 10 categories, only one or no participants reported being very experienced. These figures are similar to those from allied health therapy where at least 12% of participants

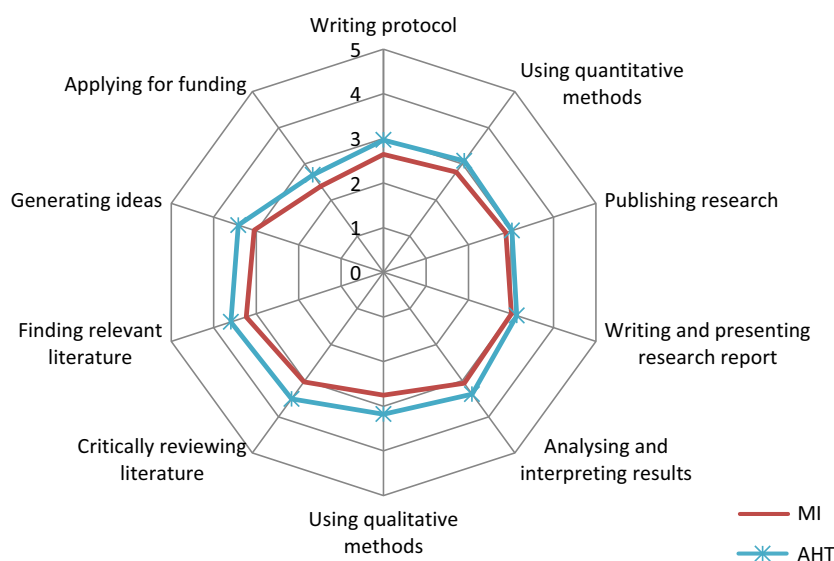


Figure 1. Research interest of allied health professionals.

Table 2. Research interest of allied health professionals in medical imaging compared to allied health therapy professions

	None		Little		Some		Moderate		Very		Between-Group Distribution Difference
	MI	AHT	MI	AHT	MI	AHT	MI	AHT	MI	AHT	
Writing research proposal, <i>n</i> (%)	23 (28)	41 (17)	15 (19)	43 (18)	23 (28)	75 (31)	8 (10)	51 (31)	12 (15)	34 (14)	$\chi^2(4) = 8.39, P = 0.078$
Using quantitative methods, <i>n</i> (%)	20 (25)	25 (10)	13 (16)	55 (23)	22 (27)	73 (30)	13 (16)	55 (23)	11 (14)	35 (14)	$\chi^2(4) = 11.90, P = 0.018^*$
Publishing research, <i>n</i> (%)	19 (24)	41 (17)	14 (17)	51 (21)	20 (25)	51 (21)	14 (17)	56 (23)	14 (17)	44 (18)	$\chi^2(4) = 7.00, P = 0.136$
Writing, presenting research report, <i>n</i> (%)	16 (20)	32 (13)	11 (14)	47 (19)	23 (28)	63 (26)	18 (22)	55 (23)	13 (16)	47 (19)	$\chi^2(4) = 3.14, P = 0.492$
Analysing results, <i>n</i> (%)	14 (17)	19 (8)	11 (14)	40 (17)	25 (31)	64 (26)	17 (21)	66 (27)	14 (17)	54 (22)	$\chi^2(4) = 7.73, P = 0.102$
Using qualitative methods, <i>n</i> (%)	18 (22)	25 (10)	17 (21)	47 (19)	23 (28)	72 (30)	13 (16)	57 (23)	10 (12)	43 (18)	$\chi^2(4) = 9.26, P = 0.055$
Critically reviewing literature, <i>n</i> (%)	17 (21)	15 (6)	10 (12)	33 (14)	19 (24)	65 (27)	23 (28)	74 (30)	12 (15)	57 (23)	$\chi^2(4) = 16.07, P = 0.003^*$
Finding relevant literature, <i>n</i> (%)	14 (17)	13 (5)	10 (12)	25 (11)	17 (21)	69 (28)	23 (28)	69 (28)	17 (21)	65 (27)	$\chi^2(4) = 12.52, P = 0.014^*$
Generating research ideas, <i>n</i> (%)	16 (20)	16 (7)	8 (10)	38 (16)	26 (32)	64 (26)	18 (22)	78 (32)	13 (16)	48 (20)	$\chi^2(4) = 15.29, P = 0.004^*$
Applying for research funding, <i>n</i> (%)	29 (36)	57 (24)	17 (21)	54 (22)	16 (20)	62 (26)	13 (16)	39 (16)	6 (7)	30 (12)	$\chi^2(4) = 5.69, P = 0.224$

*Significant difference at $P < 0.05$; MI, medical imaging; AHT, allied health therapy; †Missing data in MI cohort $n = 1$

are very interested in research and less than 5% of participants report being very experienced.

Discussion

This is the first study in Australia to evaluate the research interest, experience and confidence of allied health

professionals working in medical imaging. Overall, allied health professionals from medical imaging reported having 'some interest' in research and 'little' experience or confidence in conducting research. The level of interest of participants was related to their research experience. These results were remarkably similar to allied health professionals working in therapy disciplines. Despite the

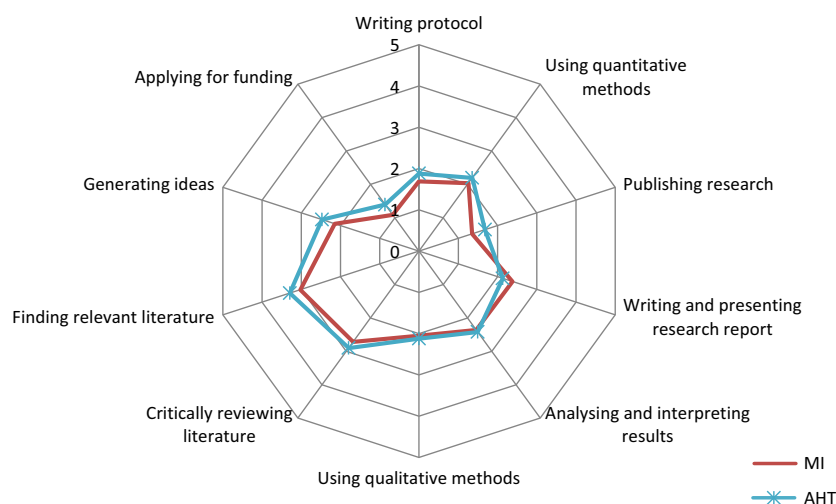


Figure 2. Research experience of allied health professionals.

Table 3. Research experience of allied health professionals in medical imaging compared to allied health therapy professions

	None		Little		Some		Moderate		Very		Between-Group Distribution Difference
	MI	AHT	MI	AHT	MI	AHT	MI	AHT	MI	AHT	
Writing research proposal, <i>n</i> (%)	45 (56)	128 (53)	20 (25)	51 (21)	13 (16)	39 (16)	2 (2)	18 (7)	1 (1)	8 (3)	$\chi^2(4) = 3.81, P = 0.433$
Using quantitative methods, <i>n</i> (%)	33 (41)	86 (36)	21 (26)	63 (26)	19 (23)	61 (25)	7 (9)	24 (10)	1 (1)	8 (3)	$\chi^2(4) = 1.56, P = 0.816$
Publishing research, <i>n</i> (%)	62 (77)	157 (65)	11 (14)	31 (13)	7 (9)	33 (14)	1 (1)	13 (5)	0 (0)	7 (3)	$\chi^2(4) = 7.19, P = 0.126$
Writing, presenting research report, <i>n</i> (%)	24 (30)	98 (40)	20 (25)	61 (25)	24 (29)	50 (21)	8 (10)	24 (10)	5 (6)	1 (5)	$\chi^2(4) = 4.37, P = 0.358$
Analysing results, <i>n</i> (%)	21 (26)	57 (24)	24 (30)	72 (30)	24 (30)	78 (32)	10 (12)	27 (11)	2 (2)	9 (4)	$\chi^2(4) = 0.625, P = 0.960$
Using qualitative methods, <i>n</i> (%)	29 (36)	78 (32)	25 (31)	84 (34)	21 (26)	60 (25)	6 (7)	19 (8)	0 (0)	3 (1)	$\chi^2(4) = 1.55, P = 0.817$
Critically reviewing literature, <i>n</i> (%)	17 (21)	30 (12)	15 (19)	62 (26)	29 (36)	72 (30)	14 (17)	60 (25)	6 (7)	19 (8)	$\chi^2(4) = 6.59, P = 0.159$
Finding relevant literature, <i>n</i> (%)	14 (17)	12 (5)	9 (11)	40 (16)	28 (35)	89 (37)	21 (26)	71 (29)	9 (11)	32 (13)	$\chi^2(4) = 13.22, P = 0.010^*$
Generating research ideas, <i>n</i> (%)	26 (32)	49 (26)	26 (32)	76 (31)	21 (26)	75 (32)	7 (9)	36 (15)	1 (1)	5 (2)	$\chi^2(4) = 6.38, P = 0.172$
Applying for research funding, <i>n</i> (%)	75 (93)	184 (76)	5 (6)	34 (14)	1 (1)	19 (8)	0 (0)	4 (2)	0 (0)	0 (0)	$\chi^2(4) = 11.16, P = 0.025^*$

*Significant difference at $P < 0.05$; MI, medical imaging; AHT, allied health therapy; †Missing data in MI cohort $n = 1$

health network providing opportunities for allied health professionals to conduct research, these previously were directed at therapists rather than allied health professionals in medical imaging. Therefore, most were unaware of support available to them. These findings provide guidance for the development of research capacity in medical imaging.

This study challenges previous reports that medical imaging professionals are apathetic towards research and lag behind peers in nursing, medicine and other allied health professions.^{16,22} Traditionally, allied health professionals working in medical imaging have worked solely under the direction of their medical peers, with their primary role to carry out instructions of the medical

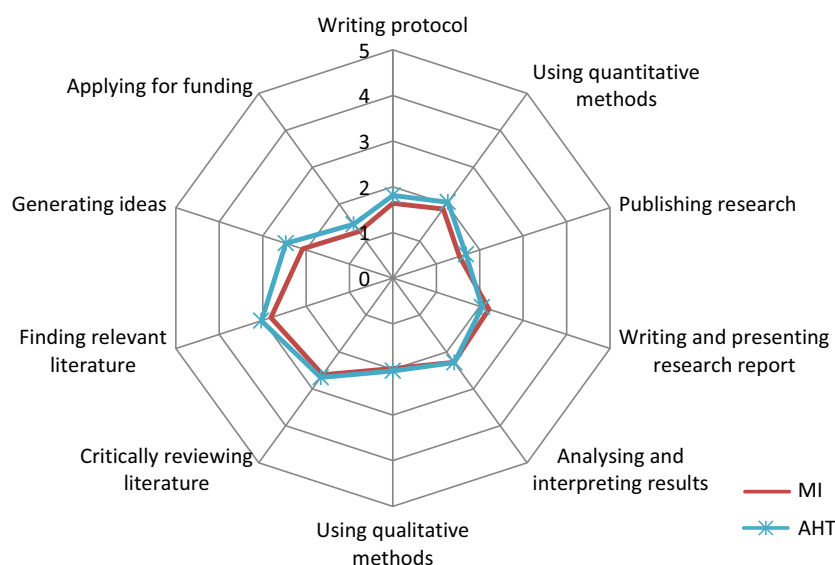


Figure 3. Research confidence of allied health professionals.

specialist.¹⁶ As such, they have not been engaged in generating knowledge and rather, their practice has relied on tradition and experience.¹⁰ Even today, the majority of the evidence base for medical imaging is from outside the radiography profession.¹³ However, while research output from medical imaging professions is low, this study demonstrates that up to a third of medical imaging professionals are overall ‘moderately or very interested’ in research. This interest may stem from efforts to increase professional identity among medical imaging professionals, with increased exposure to research within graduate degrees and attempts to keep up with advancing technology.^{10,23} It is therefore important to provide research opportunities which have previously been lacking to those who are interested.

While these findings are promising, there remain a high proportion of allied health professionals with little or no interest in research. This may be due to the clinical demands on imaging services and evolution of technology and techniques.¹⁰ It is reasonable to accept that not all medical imaging professionals will engage in primary research. However, all are expected to deliver evidence-based practice.^{12,24} The categories of most research interest were finding and reviewing literature yet over 40% of allied health professionals reported little or no experience in these areas. Given these are fundamental activities for providing evidence-based practice, as a minimum, support could be directed into these areas.

Research interest, experience and confidence of allied health professionals in medical imaging was strikingly similar to the allied health therapy professions surveyed in 2015.⁷ Research interest and confidence is also similar

to that reported for radiation therapists.^{25,26} This is noteworthy given diagnostic imaging has received little attention in allied health service research.^{7,8,27} As such, strategies to build research culture among other allied health professionals could be leveraged to enhance research capacity in diagnostic imaging. Enablers of research culture in allied health include strong leadership, supportive management and explicit local systems for research conduct and regulation.² Research is frequently viewed as separate to clinical activity and has been cited as a major barrier among medical imaging and other allied health professions.^{7,12} Therefore, there should be an expectation that research is considered as core business as opposed to separate from clinical activity to enhance research culture.²

One strategy that has been implemented in the health network involved in this study is the establishment of an Allied Health Clinical Research Office in 2007. Initiatives developed by the research office include a research training scheme, newsletter, research clinics, an annual research forum, on-site higher degree research supervision and consultancy for allied health professionals interested in undertaking research. The research office has proven successful for increasing research participation in clinicians who are interested in research, resulting in a fivefold increase in research output and an increase in clinicians from allied health therapy professions holding a PhD.⁷ However, these initiatives were previously directed at therapy allied health professionals rather than those working in medical imaging. Subsequently, the majority of medical imaging allied health professionals were not aware of the research support available to them within

Table 4. Research confidence of allied health professionals in medical imaging compared to allied health therapy professions

	None		Little		Some		Moderate		Very		Between-Group Distribution Difference
	MI	AHT	MI	AHT	MI	AHT	MI	AHT	MI	AHT	
Writing research proposal, <i>n</i> (%)	47 (58)	131 (54)	23 (28)	53 (22)	6 (7)	37 (15)	3 (4)	15 (6)	2 (2)	6 (2)	$\chi^2(4) = 4.80, P = 0.312$
Using quantitative methods, <i>n</i> (%)	38 (47)	99 (41)	23 (29)	63 (26)	10 (13)	54 (22)	9 (11)	17 (7)	0 (0)	8 (3)	$\chi^2(4) = 7.65, P = 0.105$
Publishing research, <i>n</i> (%)	51 (63)	148 (62)	19 (23)	44 (18)	9 (11)	30 (13)	2 (3)	9 (4)	0 (0)	8 (3)	$\chi^2(4) = 3.90, P = 0.419$
Writing, presenting research report, <i>n</i> (%)	28 (35)	103 (43)	23 (28)	59 (25)	16 (20)	48 (2)	10 (13)	22 (9)	3 (4)	8 (3)	$\chi^2(4) = 2.02, P = 0.732$
Analysing results, <i>n</i> (%)	25 (31)	68 (29)	24 (30)	77 (32)	20 (25)	65 (27)	9 (11)	22 (9)	3 (4)	7 (3)	$\chi^2(4) = 7.36, P = 0.947$
Using qualitative methods, <i>n</i> (%)	31 (38)	92 (38)	26 (32)	76 (31)	19 (24)	54 (22)	5 (6)	14 (6)	0 (0)	6 (3)	$\chi^2(4) = 2.07, P = 0.723$
Critically reviewing literature, <i>n</i> (%)	17 (21)	63 (26)	21 (26)	63 (26)	25 (31)	66 (28)	12 (15)	46 (19)	6 (7)	18 (8)	$\chi^2(4) = 0.94, P = 0.919$
Finding relevant literature, <i>n</i> (%)	18 (22)	35 (15)	12 (15)	51 (21)	26 (33)	62 (26)	15 (19)	60 (25)	9 (11)	34 (14)	$\chi^2(4) = 5.83, P = 0.212$
Generating research ideas, <i>n</i> (%)	30 (37)	56 (23)	24 (30)	70 (29)	20 (25)	71 (30)	5 (6)	35 (15)	2 (2)	9 (4)	$\chi^2(4) = 8.50, P = 0.075$
Applying for research funding, <i>n</i> (%)	64 (79)	173 (72)	13 (16)	43 (18)	4 (5)	17 (8)	0 (0)	6 (3)	0 (0)	2 (1)	$\chi^2(4) = 3.65, P = 0.456$

MI, medical imaging; AHT, allied health therapy.

†missing data in MI cohort *n* = 1.

the health network and participation in these activities was low. A research fellow dedicated to supporting medical imaging has been instated to promote and support research activity beyond the allied health therapy disciplines in an attempt to enhance participation. Given the similar interest in research between diagnostic imaging and allied health therapies, it is recommended research support be directed to those with interest in research to improve research experience and capacity in medical imaging.

Limitations

There are a number of considerations in the interpretation of these results. Results may not be generalisable to all medical imaging professionals as sample size was small with a moderate response rate and drawn from a single health network. It is recognised compared data were collected from two different time periods and may not be a true reflection of similarities and differences. However, previous research from allied health therapists conducted at this same organisation demonstrated changes in research interest and experience did not change over time.⁷ It is possible research interest may be overestimated as participants of this study may have participated due to their own interest in research.

However, this was mitigated by distribution of the survey at departmental meetings by managers who encouraged staff to participate. Also, the majority of imaging professionals were radiographers, with small numbers of sonographers and nuclear medicine technologists. However, the proportion of responses from each of these groups were consistent with the proportion of medical imaging professionals at the health service (i.e. radiography represents the largest and nuclear medicine the smallest department). Our results also indicated there were no differences between professions and results consistent with other allied health therapies both within this health service and others.^{8,9,26,28}

Conclusion

The results of this study show that allied health professionals working in medical imaging have low levels of participation in research. They report having some research interest, but low levels of experience or confidence. These results align with the interest, experience and confidence of other allied health professionals. Medical imaging professionals who are interested in research may benefit from research training and support strategies that have proven successful in allied health therapy professions.

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Conflict of Interest

The authors declare no conflict of interest.

References

- Department of Health. Equity and excellence: liberating the NHS. DH, London 2010. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213823/dh_117794.pdf
- Slade SC, Philip K, Morris ME. Frameworks for embedding a research culture in allied health practice: a rapid review. *Health Res Policy Syst* 2018; **16**: 29.
- Ilott I, Bury T. Research capacity: A challenge for the therapy professions. *Physiother* 2002; **88**: 194–200.
- Harding K, Lynch L, Porter J, Taylor NF. Organisational benefits of a strong research culture in a health service: a systematic review. *Aust Health Rev* 2017; **41**: 45–53.
- Victorian Government, Department of Health and Human Services. Victorian Allied Health Research Framework. Melbourne 2018. [Cited 2019, November 12]. Available from: <https://www2.health.vic.gov.au/health-workforce/allied-health-workforce/allied-health-research>
- Harding EK, Porter FJ, Horne-Thompson FA, Donley FE, Taylor FN. Not enough time or a low priority? barriers to evidence-based practice for allied health clinicians. *J Contin Educ Health Prof* 2014; **34**: 224–31.
- Taylor NF, Harding KE, Porter J, et al. Evaluating the introduction of an allied health clinical research office at a health service: effects on research participation, interest, and experience of allied health professionals. *J Allied Health* 2019; **48**: 46–53.
- Stephens D, Taylor NF, Leggat SG. Research experience and research interests of allied health professionals. *J Allied Health* 2009; **38**: e107–e111.
- Waddell JJ, Semciw AI. Research confidence, interest and experience of an Australian hospital pharmacy population. *J Res Pharm Pract* 2019; **49**: 212–8.
- Higgins R, Robinson L, Hogg P. Unlocking Student Research Potential: Toward a Research Culture in Radiography Undergraduate Learning Curricular. *J Med Radiat Sc* 2015; **46**: S6–s9.
- The Society and College of Radiographers. Diagnostic radiography: a survey of the scope of radiographic practice 2015. 2015. [Cited 2019, November 12]. Available from: https://www.sor.org/sites/default/files/document-versions/2017-05-17_diagnostic_scope_of_practice_2015_-_final.pdf
- Reid K, Edwards H. Evaluating the role of the diagnostic research radiographer. *Radiography* 2011; **17**: 207–11.
- Agwa U, Whiting C. An analysis of bibliometric data exploring factors affecting research capacity amongst HCPC registered radiographers in England. *Radiography* 2019; **25**: S33–S39.
- Swedish Society of Radiographers. Scientific advisory board. Stockholm, Sweden; 2015. [Cited 2019, November 12] Available from: http://www.swedrad.se/vr_start/ 2015
- Victorian Government, Department of Health and Human Services. Victorian Allied Health Workforce Research Project Sonography Workforce Report. Melbourne 2016. [Cited 2019, November 12]. Available from: <https://www2.health.vic.gov.au/health-workforce/allied-health-workforce/allied-health-research>
- Challen V, Kaminski S, Harris P. Research-mindedness in the radiography profession. *Radiography* 1996; **2**: 139–51.
- Wenke R, Mickan S. The role and impact of research positions within health care settings in allied health: a systematic review. *BMC Health Serv Res* 2016; **16**: 355.
- Harding KE, Shields N, Whiteside M, Taylor NF. "A great first step into research": stepping into research is an effective and sustainable model for research training in clinical settings: a report of 6-year outcomes. *J Allied Health* 2016; **45**: 176–82.
- Ried K, Farmer EA, Weston KM. Setting directions for capacity building in primary health care: a survey of a research network. *BMC Fam Prac* 2006; **7**: 8.
- Toomey RJ, McEntee MF, Rainford LA. The pop-up research centre – Challenges and opportunities. *Radiography* 2019; **25**: S19–S24.
- Smith H, Wright D, Morgan S, Moore M. The "Research Spider": a simple method of assessing research experience. *Prim Health Care Res Dev* 2002; **3**: 139–40.
- Yielder J, Davis M. Where radiographers fear to tread: Resistance and apathy in radiography practice. *Radiography* 2009; **15**: 345–50.
- Wright CA, Hilder B, Schneider-Kolsky ME. Meeting the research agenda in Australian radiation therapy: the current picture. *J Radiother Pract*. 2009; **8**: 67–77.
- Australian Society of Medical Imaging and Radiation Therapy. Professional Practice Standards 2018. Melbourne. 2018. [Cited 2019, November 13] <https://www.asmirt.org/media/371/371.pdf>
- Probst H, Harris R, McNair HA, Baker A, Miles EA, Beardmore C. Research from therapeutic radiographers: An audit of research capacity within the UK. *Radiography* 2015; **21**: 112–8.

26. Halkett GKB, Berg M, Ebert MA, et al. Radiation therapists' perspectives on participating in research. *J Med Radiat Sci.* 2017; **64**: 299–309.
27. Borkowski D, McKinstry C, Cotchett M, Williams C, Haines T. Research culture in allied health: a systematic review. *Aust J Prim Health* 2016; **22**: 294–303.
28. Finch E, Cornwell P, Ward EC, McPhail SM. Factors influencing research engagement: research interest, confidence and experience in an Australian speech-language pathology workforce. *BMC Health Serv Res* 2013; **13**: 144.