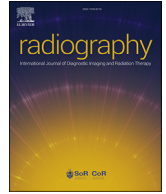


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Radiographers' knowledge and attitudes toward dementia

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ABSTRACT

Introduction: Dementia is a syndrome associated with a decline in brain function, impacting how we speak, think, feel, and behave. Misunderstanding of dementia and how it affects patients and their carers is common. There is limited research on how radiographers provide adequate care to those with dementia. Radiographers with knowledge and positive attitudes can reduce stigma and fear, improving the quality of care. This study aimed to assess radiographers' knowledge and attitudes towards dementia.

Methods: A cohort of registered radiographers in Ireland participated in an online survey. Two pre-existing validated questionnaires: The Alzheimer's Disease Knowledge Scale (ADKS) and the Dementia Attitudes Scale (DAS), assessed radiographers' knowledge and attitudes towards dementia and people with dementia. Scores were compared across variables such as gender, age, grade, qualification, work setting, and the number of years qualified.

Results: A total of 123 radiographers responded. Knowledge scores did not significantly differ across demographic groups ($p > 0.05$). Total knowledge scores ranged from 60% to 100%. Total attitude scores ranged from 50% to 100%. Participants with a BSc, MSc, and other post-graduate degrees scored higher on the attitude scale than those with a diploma qualification ($p = 0.027$). Those with less than 20 years' experience scored higher than those with more. Knowledge had little correlation with attitude ($r = 0.0522$; $p = 0.5667$).

Conclusion: Findings indicate variations in attitudes linked to age and experience, and some misconceptions can be observed across varying groups. Interventions to improve attitudes and raise awareness are needed.

Implications for practice: There is a need for further research and education on dementia care in the imaging department. We have identified areas requiring further education.

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Introduction

Dementia is often misunderstood as a single disease.¹ Instead, it is an umbrella term that describes a group of related symptoms caused by different brain conditions.² Dementia can alter one's speech, ability to process memory, cognition, and behaviour.^{3–5} Currently, fifty million people worldwide are living with dementia,⁵ of which approximate 64,000 Irish people, with predictions of an increase to 150,000 by 2045.^{1,6} Globally, Alzheimer's Disease International (ADI) estimates that someone develops dementia every 3 s.^{7,8} Many cases are not ever diagnosed. Once considered a rare disorder, dementia is now a significant public health problem.⁹ Now more than ever, it's time for all health professionals, including radiographers, to understand dementia

and adapt our practice to care for this increasing proportion of our patient cohort.

For years, there has been a lack of knowledge and understanding of dementia, resulting in barriers to diagnosis and stigmatization during care.^{3,5} Only 1 in 4 Irish people report having a good understanding of dementia.⁷ Challenging the way people with dementia are depicted has been an ongoing battle. Negative stereotypes often result from the lack of first-hand experience or knowledge of the disease. However, this could also result from ignorance and lack of research in this area.¹⁰

Medical imaging is essential in diagnosing dementia.^{11,12} Standard medical procedures that this cohort of patients undergoes routinely include Magnetic Resonance Imaging (MRI), Computed Tomography (CT) and Positron Emission Tomography/CT (PET/CT). However, as older people are prone to multiple diseases, people with dementia are likely to have, on average, four comorbidities, compared to two for people of the same age without dementia and thus commonly receive

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more imaging in general.¹³ People with dementia have double the risk of a hip fracture as the general population.^{14,15} Thus, medical imaging is often necessary for many patients with dementia. The need for radiographers' contact with this cohort of patients is inevitable and increasing.

Healthcare workers and radiographers experience many communication challenges during encounters with people with dementia.^{16,17} The World Alzheimer's Report (2019) indicates that roughly 40% of the public think healthcare workers ignore people with dementia,⁸ despite the World Health Organisation (WHO) development of dementia-friendly environments as a global action plan 2017–2025 to battle and break down the stigmatization of this disease.⁵

Publications specific to radiography have shown that radiographers hold negative attitudes toward people with dementia^{18–20} and that there are inconsistent training and guidelines for radiographers²¹ to deal with these patients. However, each of these studies is in the context of a specific healthcare system, and different issues will arise with variations in how health is delivered. To understand more about how patients with dementia are treated during radiography in the Irish setting, we must understand radiographers' knowledge and attitudes toward people with dementia; this will facilitate meaningful interventions and improve experiences where patient-centred care is practised.²² Arrivals into the diagnostic imaging department are occasionally unpredictable, and radiographers face many daily challenges. However, the patients admitted are facing their challenges too. Achieving person-centred care with every patient is essential; just because someone has dementia doesn't mean care should be compromised. Establishing personhood-based knowledge will ensure better care provision during imaging procedures,²³ and, in turn, this will improve attitudes.

This study aims to evaluate the knowledge and attitudes of Irish Radiographers toward dementia and will identify whether there is an association between knowledge and attitudes with age, gender, qualification, radiography grade, hospital setting and work experience.

Materials and methods

Ethical approval was obtained from the Social Research Ethics Committee (Clinical Therapies subcommittee, CT-SREC-2019-46) at University College Cork, Ireland. All participants had to complete a participant consent form before completing the survey. A participant information sheet informed the participant of the confidential measures involved in the study, particularly stressing the voluntary nature of their involvement.

The study used a quantitative design. The target population for this study was a cohort of registered radiographers in Ireland. Any radiographer registered with the Radiographers Registrations Board (RRB), working in Ireland and willing to participate in the survey, was included in the study. A mixture of snowball sampling and e-mail circulation was used to recruit participants for this study. The link to the online survey was shared via e-mail to managers of Irish Radiography departments ($n = 98$) and transmitted via the professional body and social media channels such as Facebook, Twitter, and LinkedIn. Participants could self-select into the survey and share it with colleagues. Survey consisted in a study composed of three sub-questionnaires: the demographic questionnaire, the ADKS and the DAS. The online survey was left open to accept responses for three weeks.

Participant demographic information was collected, including gender, age, qualification, radiography level, hospital setting, and

the number of years qualified. Two pre-existing validated questionnaires were used to capture radiographers' knowledge and attitudes toward people with dementia, both parameters based on scales. The Alzheimer's Disease Knowledge Scale (ADKS)²⁴ was used to determine individual radiographers' basic knowledge of Alzheimer's disease, the most common cause of dementia. The open source Dementia Attitudes Scale (DAS)²² was used to assess radiographers' attitudes toward people with dementia. The ADKS and DAS use a Likert scale with a reversed scored system, which aims to reduce extreme responding bias and minimize the conscientious agreement effect.

The data retrieved from all questionnaires were imported into Excel 2016. Descriptive summary statistics for each scale (ADKS and DAS) were presented in tables. These included: numbers, percentages, mean total scores, standard deviation, and minimum and maximum values. Inferential Statistics were calculated using Stata Release 15.1 (StataCorp, Tx), statistical software for data science. Answers were coded for statistical purposes.

Linear regression models for knowledge scores and attitude scores with each of the demographic characteristics as single categorical predictors were assessed: gender (female versus male), different age groups (20–30 years, 30–40 years, 40–50 years and 50–70 years), different radiography grades (Basic Grade Radiographer (BGR), Senior Radiographer (SR), Clinical Specialist Radiographer (CSR) and Radiography Services Manager (RSM)), qualification (Diploma, Bachelors degree of Science (BSc), Master's degree of Science (MSc), other Post-graduate Qualification), hospital setting (public, private, voluntary) and years qualified (<5 years, 5–10 years, 10–20 years, >20 years). Correlation between knowledge and attitude scales was also assessed using Pearson's correlation coefficient, and a p -value <0.05 was statistically significant.

Results

A total number of 123 radiographers took part in the study. At writing, 2816 radiographers were registered with the Radiographers Registration Board in Ireland, and participation represents 4.4% of the target population. Table 1 indicates that the modal responder was a female, aged 30–40, with an MSc degree, working at the senior radiographer level in the public setting for over 20 years.

Table 1
Participant Characteristics.

Variable	Group	Number (n)	Percentage (%)
Gender	Female	108	88
	Male	15	12
Age (Years)	20–30	31	25
	30–40	42	34
	40–50	38	31
	50–70	12	10
Qualification	Diploma	3	2.4
	BSc	31	25
	MSc	38	31
	Other Post Grad	51	41
Radiography Grade	BGR	38	31
	SR	43	35
	RCS	35	28
	RSM	7	6
Hospital Setting	Public	81	66
	Private	22	18
	Voluntary	19	19
Years Qualified	<5	21	17
	5–10	19	15
	10–20	41	33
	>20	42	34

Alzheimer's disease knowledge scale (ADKS)

The ADKS consists of 30 statements about Alzheimer's disease. The participant is given the option to deem the statement true or false. The questions presented in the scale were designed to capture one's knowledge of Alzheimer's disease from all aspects. The score was calculated by combining the correct items, ranging from 0 to 30. Higher total scores were indicative of better knowledge. Each participant's score was calculated from 30 and converted to a percentage score. The percentage of people who got the correct answer for each question was also calculated, highlighting the areas of Alzheimer's disease where people lacked the most knowledge. Overall scores ranged from 60% to 100%. Results can be seen in Table 2 and indicate the scores assessed according to demographic variables; age, gender, radiography level, qualification, clinical setting, and the number of years qualified. Mean, standard deviation, and minimum and maximum scores were then assessed.

Dementia attitudes scale (DAS)

The DAS consists of 20 attitude descriptors relating to Alzheimer's disease-related dementia. The questions are graded on a 7-point Likert scale of response alternatives from strongly disagree [1] to strongly agree [7]. Possible scores ranged from 20 to 140, and lower scores indicated more positive attitudes. Overall scores in this study ranged from 70 to 140. Results are shown in Table 3.

Linear regression models were used for the Alzheimer's disease Knowledge scores (Table 4) and the Dementia Attitudes Scale scores, with each demographic characteristic as a single categorical predictor. No linear correlations were found.

After a single variable analysis, the ADKS and the DAS correlation were investigated. Pearson's correlation coefficient (r) was 0.0522, indicating no connection or a weak connection between the two scales, and it was not statistically significant ($p = 0.5667$).

Discussion

This work adds to the limited relevant research in Ireland assessing radiographers' knowledge and attitudes towards people with dementia. In line with this, the current study lacked supporting evidence for comparison. Comparison is made even more

difficult because some authors change from the original²² 7-point scale of the DAS to a 5-point scale, and some reverse the original negative scoring direction to a positive one. This means some studies report a higher DAS as better and some the opposite.²⁵

The results from this study demonstrated no statistically significant differences between the groups. Knowledge was not associated with any demographic measures, but attitudes were. The results on knowledge (ADKS) were promising. Total knowledge scores ranged from 60% to 100%, with a mean of 78.9%, indicating good levels of knowledge across all radiographer groups examined. When analysed using the ADKS, 92% of radiographers correctly disagreed with the statement, "when people with Alzheimer's disease repeat the same question or story several times, it is helpful to remind them that they are repeating themselves". 97% correctly answered, "Alzheimer's disease is one type of dementia". These results were in contrast to the World Alzheimer's Report (2019) suggested healthcare staff had poor knowledge of dementia, supported by 60% of healthcare staff still anticipating dementia as a normal part of ageing.⁸

More positive attitudes were correlated with being older, having a higher grade and having more qualifications. Questions poorly answered in the ADKS were that radiographers did not recognize that "tremor or shaking of the hands or arms is a common symptom in people with Alzheimer's disease".²⁶ Also, 67% incorrectly agreed that "symptoms of severe depression can be mistaken for symptoms of Alzheimer's disease". The minority of respondents were aware (41%) of the correct statement that "it has been scientifically proven that mental exercise can prevent a person from getting Alzheimer's disease". Epidemiological studies have highlighted the effects of the cognitive reserve on reducing the risk of developing dementia.²⁷ A total of 48.4% of dementia cases can be attributed to many reversible risk factors. These include smoking, alcohol, obesity, cognitive attainment and much more.⁷ These results demonstrate that although knowledge is good in some areas, there is still room for further education on dementia symptoms and prevention.

This study found moderate attitudes among radiographers toward people with dementia. Total scores ranged from 70 to 140. Previous studies assessing radiographers' attitudes toward people with dementia found more negative attitudes eminent.²⁰ Research conducted on radiographers in Norway to assess attitudes toward

Table 2

ADKS scores by category. Key: BGR= Basic Grade Radiographer; SR Senior Radiographer; CSR=Clinical Specialist Radiographer; RSM = Radiography Service Manager.

Variable	Group	Mean ADKS %	Standard deviation (SD)	Min (%)	Max (%)
Gender	Female (n = 108)	80	9.0836	60	100
	Male (n = 15)	70.3	11.048	60	100
Age (Years)	20-30 (n = 31)	80.15	9.381	60	97
	30-40 (n = 42)	78.19	9.577	60	100
	40-50 (n = 38)	80.71	8.652	60	97
	50-70 (n = 13)	83.18	10.058	67	100
	Diploma (n = 3)	80.6	5.773	83	93
Qualification	BSc (n = 31)	80.45	10.158	60	100
	MSc (n = 38)	78.63	8.740	67	97
	Other (n = 51)	80	9.156	60	100
	BGR (n = 38)	81.76	10.114	60	100
Radiography Grade	SR (n = 43)	78.63	9.046	60	97
	CSR (n = 35)	80.8	8.774	60	97
	RSM (n = 7)	75.28	8.260	67	87
	Public (n = 81)	80.57	9.540	60	100
Hospital Setting	Private (n = 22)	79.95	8.56	60	93
	Voluntary (n = 19)	76.88	8.857	60	90
Years Qualified	<5 (n = 21)	80.66	10.99	60	97
	5-10 (n = 19)	78.65	8.94	60	97
	10-20 (n = 41)	78.48	9.418	60	100
	>20 (n = 42)	81.60	8.378	67	100
Overall		79.92	9.294		

Table 3

Dementia Attitude Scale Scores by Category- Lower scores indicate more positive attitudes. Significant differences within groups are denoted with *. Key: BGR= Basic Grade Radiographer; SR Senior Radiographer; CSR=Clinical Specialist Radiographer; RSM = Radiography Service Manager.

Variable	Group	Mean DAS score	Standard deviation (SD)	Min (%)	Max (%)
Gender	Female (n = 108)	110.89	13.739	70	138
	Male (n = 15)	110.40	16.973	89	140
Age (Years)	20-30 (n = 31)	111.19	13.39	87	136
	30-40 (n = 42)	113.98	13.013	91	140
	40-50 (n = 38)	110.71	14.21	80	137
	50-70 (n = 13)	98.27*	14.485	70	119
Qualification	Diploma (n = 3)	87.66*	16.258	70	102
	BSc (n = 31)	111.90	12.941	89	137
	MSc (n = 38)	112.60	10.642	89	133
	Other Post Grad (n = 51)	110.24	15.94	80	140
Radiography Grade	BGR (n = 38)	115.08	13.62	91	140
	SR (n = 43)	110.27	14.74	70	134
	RCS (n = 35)	105.80*	11.888	82	137
	RSM (n = 7)	119.14	14.69	93	138
Hospital Setting	Public (n = 81)	109.19	14.608	70	137
	Private (n = 22)	113.00	11.338	89	140
	Voluntary (n = 19)	115.77	13.867	95	138
Years Qualified	<5 (n = 21)	113.80	13.075	95	140
	5-10 (n = 19)	112.69	14.687	87	137
	10-20 (n = 41)	113.00	14.417	87	138
	>20 (n = 42)	106.56*	13.45	70	132
Overall mean (M) for DAS (n = 123).		110.83	14.09		

Table 4

Correlation of individual demographic variables with ADKS and DAS. Statistically significant results are marked with *.

Variable	ADKS		DAS	
	r ² -value	p-value	r ² -value	p-value
Gender	0.001	0.093	0.001	0.89
Age	0.025	0.379	0.089	0.01*
Qualification	0.034	0.249	0.074	0.028*
Grade	0.035	0.233	0.083	0.016*
Hospital Setting	0.019	0.314	0.032	0.146
No. of Yrs. Qual.	0.023	0.422	0.048	0.120

people with dementia,²⁰ found negative attitudes. Likewise, in 2018 Challen et al. elicited negative experiences among radiographers and staff.³ The current study results suggest that Irish radiographers have better knowledge and more positive attitudes towards patients with dementia.

In contrast to the knowledge scale, demographics demonstrated a connection with one's attitudes to dementia, suggesting a relationship between radiographers' age, qualifications, and grade with their attitudes. In general, older staff with more experience and diploma education demonstrate more positive attitudes toward people with dementia. Male radiographers had equal attitudes when compared to women; this contradicts the ADI report that indicated men are likely to hold more stigmatizing views about people with dementia.⁸ The link to diploma education is likely associated with age, as the Diploma qualification was largely replaced with degree education in the 1980s and 1990s. A possible explanation for the younger radiographer's poor attitudes toward people with dementia is a lack of lived professional experience or personal experience in caring for people with dementia. With less experience come difficulties in communication for the radiographer, which could include misinterpretation of the patient's frustration. This is inconsistent with findings from a study among nursing staff. Sullivan and O' Conor²⁸ found a strong relationship between good levels of knowledge and positive attitudes, concluding that an adequate understanding of dementia highlights more positive attitudes among staff. However, after calculating Pearson's Correlation Coefficient ($r = 0.05$), the current study found no relationship between one's knowledge and attitudes.

Alternatively, those with more years since qualification could highlight more experience. Previous studies assessing nursing knowledge and attitudes found that older staff who had more experience with people with dementia had more positive attitudes.²⁹ However contradictory, radiographers in this study who were over 50 years old, with more than 20 years of experience, tended to portray more negative attitudes than younger ones with less experience. There was no relationship between the type of care setting one worked in and their knowledge and attitude to people with dementia in the proposed study. A study conducted in the United Kingdom among nursing staff considered if attitudes were affected by nurses' care settings.³⁰ Nurses with experience working in acute care had more positive attitudes towards AD patients than those without exposure and appropriate knowledge. They concluded that educational strategies could help improve radiographers' knowledge and skills, thus influencing how they perceive and manage AD patients. Ebert et al.³¹ suggest that greater personhood-based understanding can encourage a dementia-friendly environment.

At a deeper level, DAS results implied that Irish radiographers agreed strongly with the statement 'It is rewarding to work with people who have ADRD (Alzheimer's disease-related Dementias)'. The majority also agreed that 'difficult behaviours may be a form of communication for people with ADRD'. This is suggestive of good radiographer knowledge and understanding of challenging behaviours. However, it may suggest that radiographers are comfortable working with people with dementia, but this cannot be assumed. Contrary to positive attributes on the scale, respondents also agreed moderately with the statement 'I cannot imagine taking care of someone with ADRD' and 'I feel frustrated because I do not know how to help people with ADRD'. On the other hand, these statements covet the need for education and training on how to help people with dementia, since it appears that dementia care training for staff to gain knowledge is inadequate.²⁹

In the past number of years, there has been a significant increase in awareness of Alzheimer and Dementia. Almost 80% of the general public is concerned about developing dementia, and 1 in 4 people think there is nothing we can do to prevent dementia.⁷ Dementia itself can influence clinical practice and challenge healthcare staff. Better knowledge and attitudes can strongly impact care,³² reflecting

more positive experiences in the diagnostic imaging department. It's time for healthcare practitioners to look closely at where they can improve and for governments to increase dementia training. Assessing radiographers' knowledge consistently over time will provide better insight into understanding.

Limitations of the study

Elements of limitation constrained this study. The response was only 4.4% of the registered population. The survey was also distributed via an online link, implying that non-response bias could not be eliminated, and online participation risks only include people with smart devices and computers. In-person questionnaires or the facilitation of an online hub would have significantly benefited the response rate and could incorporate a more significant number of participants with unique individuals. The ADKS and DAS have limitations, including the risk of conscientious agreement during a Likert scale, which results in extreme responding bias. Efforts to decrease this involved the introduction of a reversed scored system. Half of the questions were reverse scored to minimize the conscientious agreement effect.

At the same time, responses were received from those interested in the topic and engaged with research, so those non-responders may have different knowledge and attitudes. Furthermore, the modal responder having an MSc degree does not reflect the modal radiographer. Perhaps the higher scores for dementia knowledge are related to a bias of engaged, further and higher educated. Additional work should consider methodological approaches that include a more representative sample of registered radiographers.

The current study identified overall good knowledge and attitudes amongst radiographers in Ireland towards people with dementia. Similarly, there was good knowledge and awareness of dementia. However, some groups scored higher than others, concluding the need for further education and training to reduce stigmatized knowledge and improve radiographer attitudes. Additional training would be clinically significant where better knowledge, attitudes and behaviour towards people with dementia improved the experience of those with dementia. More knowledge leads to less prejudice and less impatience. Knowing that including carers in the imaging process positively impacts on patients could increase radiographers' ability to obtain a good diagnostic image³ and help focus efforts on reducing stigma. To improve the lives of people with dementia and their families and carers, further research is needed to assess their attitudes. This will aid the delivery of effective patient-centred care and improve the quality of life for those suffering.

Ensuing recommendations

Previous work has demonstrated positive attitude changes by nurses as educational programs advanced their knowledge about dementia care.³³ Studies using educational interventions have found that nurses' attitudes and practices improved, and positive attitudinal changes were adopted after education.³⁴ Participants in educational interventions also reported increased contributions to improve hospital environment, patient safety, and behavioural management.²³ The findings of the above systematic review concluded "that a higher level of knowledge is correlated with higher confidence level and positive attitudes".

Although the current work demonstrates that radiographers' knowledge is, on average good (110/140), there is still room for improvement. One area where increased knowledge can help in knowing that the environment can be confusing for patients with dementia. Waller and Masterson²³ and O'Neil et al.³⁵ recommend

adapting the care environment to suit the needs of the individual. Sensory-stimulating interventions aid prevention of challenging symptoms and behaviours. Techniques may include modifying the radiographic environment to ensure comfort, respect and privacy. This can be achieved by decreasing the noise, minimizing the staff involved and personalizing the procedure room to suit the patient's needs. Due to behavioural symptoms enhancing in unfamiliar and noisy settings like a hospital, carers should be involved. Martain-Caraso et al.³⁶ even found a reduction in difficult behavioural symptoms by including the carer. Asking carers to bring small personal items of familiarity to reduce fear and anxiety is also beneficial.

Recommendation for future studies and education

There is a definite need to increase dementia knowledge among radiographers. Increased knowledge can change attitudes. With a rapid increase in people living with dementia, adequate care during radiography is needed more now than ever. Specialized education and training on dementia are lacking in many domains.²⁵ From the studies discussed above, attitudes and knowledge have increased with education. In a recent survey, only 40% of healthcare staff reported receiving dementia training.³⁷ Education for staff using the well-known and adapted framework VERA (Validation, Emotion, Reassurance, Activity) to aid the team in communicating with patients with dementia and minimize unmet needs might be beneficial.³⁸ This was tested on a sample of student nurses in Ireland, signifying greater communication outcomes.³⁹

Further studies should assess the impact of an education intervention on radiographers' attitudes, including students. To do this, educational and training resources must be developed for dementia management and care during radiography. Further research would be beneficial, and appropriate circumstances will be encouraged – for example, the evaluation of practical communication skills and the development of dementia-friendly physical environments. Establishment and protocol testing for patients with dementia can also be investigated. This work concurs with the findings of Challen et al.,³ where it is mentioned that 'radiographers need training about dementia, imaging services can improve their procedures and environment, and work in greater partnership with carers.'

Conclusions

No difference in knowledge or attitudes toward dementia was found based on gender, age or qualification. Further work is needed to understand radiographers' clinical behaviour towards people with dementia and how these affect those with dementia. Although radiographers' knowledge of dementia is good (80%), specific areas of expertise could be enhanced. Likewise, the dementia attitudes of radiographers were good (110/140), but further work could improve this. There are no subgroups of radiographers that need greater or lesser attention.

Conflict of interest statement

None.

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