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Dementia education for Diagnostic Radiography students: Impact on confidence, knowledge, and attitudes towards dementia

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ABSTRACT

Introduction: Diagnostic radiographers play a key role in the healthcare of people living with dementia, capturing and producing diagnostic images in a range of settings. Diagnostic radiographers often lack the confidence and skills to assess people with dementia appropriately, and people with dementia often report negative experiences within imaging departments. There is a lack of radiography-specific dementia education within pre-registration programmes in the UK so newly qualified radiographers enter the workforce unprepared. The aim of this study was to evaluate the impact of a co-produced dementia education programme on student radiographers' preparedness to care, knowledge, confidence and attitudes towards dementia.

Methods: A 3-hour co-produced dementia education was delivered and evaluated using a pre-test-post-test design. A single self-administered questionnaire, comprising validated instruments, was used to assess second-year radiography students' knowledge, confidence and attitudes towards dementia. Wilcoxon signed-rank test was used to compare scale scores before and after the education.

Results: Participants knowledge, confidence and preparedness to care for people with dementia significantly increased following the intervention. Attitudes were also more positive post-intervention. Participants reported that they found the education valuable.

Conclusions: Dementia education comprising of taught theory and simulation-based education, co-produced with experts by experience, effectively improves diagnostic radiography students' knowledge, confidence and attitudes in caring for people living with dementia.

Implications for practice: Combined theory and practice-based dementia education should be included in undergraduate diagnostic radiography curriculums.

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Introduction

Dementia is an umbrella term for a group of neurological conditions with symptoms associated with the progressive decline of brain function. The most common type of dementia is Alzheimer's Disease, although there are over 200 different types of dementia.[1] People with dementia often have comorbidities and other complex needs. The World Health Organization[2] recognises dementia as a global health priority, with an estimated 55 million people with dementia globally. The UK government identified dementia as one of 6 major health conditions in the Major Conditions Strategy,[3] recognising it as the leading cause of death in England.[3] People with dementia occupy 1 in 4 hospital beds[4] and are more likely to be admitted than those without dementia.[5,6] Healthcare professionals must be equipped with sufficient knowledge, confidence and attitudes to support and care for people with dementia.

Diagnostic radiographers often care for people with dementia, as diagnosis involves diagnostic examinations via various modalities including computed tomography (CT) and positron emission tomography (PET). Furthermore, people with dementia are more likely to require imaging for injuries or infection through emergency and acute pathways.[7,8] Despite frequent contact, radiographers lack the necessary knowledge and confidence to provide quality care for people with dementia. Qualified and pre-registration diagnostic radiographers report insufficient understanding of dementia and its effects, and limited skills in modifying practice and providing appropriate care for people with dementia.[9] Negative attitudes towards people with dementia have been reported, with the lack of education and experience being contributing factor.[10–13]

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Dementia is absent within the Health & Care Professions Council Standards of Proficiency for Radiographers[14] and only briefly mentioned in the Curriculum Framework for Radiography.[15] Research suggests that educating student radiographers positively impacts their holistic understanding of dementia,[16] and that dementia education should be contextualised and profession specific.[11,17,18] Embedding dementia education in undergraduate diagnostic radiography curricula prepares students for clinical placement and careers post-qualification.[18–20] This study investigates the impact of a bespoke dementia education package on student diagnostic radiographers' knowledge, attitudes, and confidence in caring for people with dementia. Student's perceptions of their preparedness to care for people with dementia, and evaluative data on the dementia education were also collected.

Methods

Design

Second-year radiography students received a 3-hour dementia education package. A pre-test-post-test design using an online survey comprising self-completion validated questionnaires and open-ended questions assessed students' knowledge, confidence, and attitudes towards dementia, and preparedness to care. Students were recruited via the university's Virtual Learning Environment and received the participant information sheet two weeks before the study. Participation was voluntary, and non-participation did not affect students' education. Participants provided consent by ticking a box on the first page of the survey, and responses were collected anonymously. The questionnaire was distributed and open for two weeks prior to the education (September 2023) (T1) and open for two weeks following the completion of the education (November 2023) (T2). Ethical approval for the research was granted by the Chair of the Humanities, Social, and Health Sciences Research Ethics Panel at the participating university (Ref: EC27918, 7th August 2023).

Sample and setting

A convenience sample of second-year undergraduate diagnostic radiography students at a university in north–central England was used. The full cohort of 57 students were invited to participate with no other exclusion or inclusion criteria.

Education package

The education included a 1.5-hour lecture delivered face to face by two specialist dementia educators, as recommended by Surr et al.[17] This was followed by a 1.5-hour clinical simulation facilitated by a Clinical Teacher in Radiography and co-delivered by people with dementia and their supporters (i.e. experts by experience including paid and unpaid caregivers[21]). Year 2 of the diagnostic radiography course already had specified dementia learning outcomes and therefore was identified as the optimum site for the education and associated research.

Lecture content was mapped to Tier 2 of the Dementia Training Standards Framework[22] including, Subject 1: dementia awareness, Subject 4: person-centred dementia care, Subject 5: communication, interaction and behaviour in dementia care and Subject 9: families and carers as partners in dementia care. Teaching methods included quizzes, individual and group activities and a facilitated video-reflection exercise (co-designed by experts by experience).

Simulation involved a role play scenario. Students carried out a mock lumbar spine x-ray. Non-trauma lumbar spine involving 2 projections was selected as the scenario, providing opportunities for students to interact with the experts by experience without added complexity of a trauma scenario. The simulation environment and plan were introduced to experts by experience. 6 iterations of the simulation were run across two days, with between 6 and 12 students and 2 experts by experience in each session. A pre-brief introduced the experts by experience, contextualised the scenario and defined simulation learning outcomes. Post-simulation debriefs facilitated student reflection on the activity, with feedback on practice proffered by the experts by experience and facilitators.

Measures

The single self-administered questionnaire, comprised of three already validated instruments including The Dementia Knowledge Assessment Tool −2 (DKAT2),[23] the Confidence in Dementia Scale (CODE),[24] and the Dementia Attitudes Scale (DAS).[25] Demonstrating sound psychometric properties, these scales are suitable for use by professional caregivers.[26] The DKAT2 comprises 21 items, where higher scores (ranging 0–21) indicate enhanced knowledge. CODE, a 9-item questionnaire, is rated on a five-point Likert scale from not confident to very confident, yielding scores from 9 to 45, with higher scores signifying greater confidence in dementia care. DAS encompasses 20 items scored on a 7-point Likert scale, ranging from strongly disagree to strongly agree, with total scores ranging from 20 to 140; higher scores denote more positive attitudes toward dementia.

At T1, demographic data including age, gender, ethnicity, previous dementia education/training, along with prior caregiving responsibilities for individuals with dementia, were collected. Participants also reported their overall preparedness to care for people with dementia at both T1 and T2. Open-ended questions were used to expand on responses to the validated surveys (T1/2). Evaluative comments about the education were also sought (T2).

Data analysis

Descriptive statistics (i.e. frequencies and percentages) were used to describe participants' demographics. For analysis of pre-post change on total scores of the DKAT2, CODE, and DAS the Wilcoxon signed-rank test was used as change scores were not normally distributed. Effect sizes which measure the strength of the difference between pre- and post-test results were calculated for the Wilcoxon signed rank test using the formula $r = z/\sqrt{n}$. in which 0.1 (small effect), 0.3 (moderate effect) and 0.5 and above (large effect). A Pearson's chi-square test was used to detect differences for preparedness of care, as this is a nominal variable. For all analysis, p values of less than or equal to 0.05 were considered statistically significant. Open text qualitative comments were used to support quantitative data, where relevant.

Results

Of the 57 student radiographers invited to participate, 40 attended the lecture (70 %) and 46 attended the simulation (81 %). As 40 students completed the full education package, the pre-education survey (T1) and post-education survey (T2) response rate was 87.5 % (n = 35) and 75 % (n = 30) respectively. There were no incomplete questionnaires.

Descriptive characteristics of respondents at T1 and T2

Most participants were female (76.4 % at T1, 66.6 % at T2). Most were aged between 18 and 24 (57.1 % at T1, 63.3 % T2). 15 participants identified as Asian/Asian British – Pakistani (42.8 % at T1,

43.3 % at T2), 10 as White-British (28.5 % at T1, 26.6 % at T2) and 5 as Black/Black British – African (14.3 % at T1, 16.6 % at T2). At T1 over half the students had received prior basic training on dementia awareness (67.6 %), person-centred dementia care (69 %), and communication, interaction and behaviour in dementia care (74.1 %), with only 1 student (3.4 %) receiving advanced training in these areas. Furthermore, 27 students had prior experience of caring for a person with dementia (77.1 %) either as a family member or during prior placement, with only 9 (25.7 %) students having no prior caring experience.

Preparedness

Students reported feeling significantly more prepared to care for people with dementia after the education (X^2 (2, $N = 30$) = 11,357, p=0,003). At T1, only 7 students (20 %) said they felt prepared to care for people with dementia, with 19 (54.3 %) not sure and 11 (31.4 %) stating they felt unprepared to care. In the qualitative comments students identified that prior clinical placement had helped somewhat with preparedness, although limited time spent with people with dementia during placement impeded their preparedness to care. Students reported preparedness increased following the education (T2), with 25 (83.3 %) declaring they felt prepared to care, no students felt ill-prepared and 5 others (16.7 %) not sure. Comments suggested that students were more prepared in understanding individual needs and the role of carers.

Knowledge

There was a significant increase in students' knowledge following the education. The Wilcoxon test showed a significant difference between T1 and T2 ($z = -3{,}912$, $p < 0.01$), with the mean of correct answers increasing from 10.99 at baseline to 14.99 after the education (Table 1). An effect size of 0.95 was obtained, meaning the difference between T1 and T2 scores was large (0.95).

The number of correct answers increased for almost all items, more significantly, the increased knowledge of different types of dementia and the positive impacts the environment can have on people with dementia. Exceptions were noted for "Sudden increases of confusion are characteristic of dementia". The qualitative comments indicted that students' at T2 still require guidance on how to "help patients with dementia when they are agitated" (Student 5).

Confidence

Students' confidence also significantly increased following the education ($z = -3.918$, $p < 0.001$). The mean score increased from 27.36 (somewhat confident) to 35.36 (very confident) (Table 2). A large effect of 0.72 was obtained. Positive changes between T1 and T2 were observed for all items. The lowest confidence scores at T1 and T2 were obtained for "I feel able to manage situations when a person with dementia becomes agitated". At T2 scores were higher for "I feel able to interact with a person with dementia when they can communicate well verbally" and "I feel able to help a person with dementia feel safe during their stay in hospital". Students' qualitative comments suggested that a barrier to confident practice is the lack of time spent with patients, e.g. "The time we spend with a patient is generally very short, I worry that I don't know how to properly assess the patients' needs with such a limited interaction" (Student 1, T1), however after student's comments indicated better preparation could support confidence and best practice, e.g. "I would plan before the examination so that everything is in preparation before the dementia patient is present in the room" (Student 12, T2).

Attitudes

Pre-post analysis on total DAS scores (n = 30) revealed that dementia attitudes were more positive after the dementia education, with the mean scores increasing from 97.38 to 102.3 (Table 3). However, the difference was not significant ($z = -1796$ $p < 0.073$) and the effect size was 0.33. Positive changes between T1 and T2 were noted in all items. "I am not very familiar with dementia" was the item that showed the biggest difference between T1 and T2 (a difference of 2.2 points). "People with dementia can feel when others are kind to them" was the item with the smallest difference (a difference of 0.3 points).

Evaluation of the education

Most students were satisfied (50 %) or very satisfied (36.7 %) with the dementia education they received. Students felt the education was very relevant (73.3 %) or quite relevant (17.7 %) to their role as a radiographer, very easy (40 %) or easy (40 %) to understand, and they felt confident in their ability to put the learning into practice (90 %). The qualitative comments indicated the strengths of the education were the involvement of people with dementia within the education, e.g., "Working with actual human beings who live with dementia and their partners was very helpful in the simulation. Interacting with a real person living with dementia helped a lot in learning more and asking them what more we could do to provide better service" (Student 1). While most comments were positive about the involvement of experts by experience, 2 students cited that they were unprepared for the experts' involvement in the simulation, and were concerned about their welfare. During the activity all experts were monitored by experienced dementia educators and reported to be happy during their involvement. Students requested more practical advice on how to afford more time in clinical environments to people with dementia, and how to manage distress. The mode of education delivery was evaluated, with 22 students (73.3 %) preferring clinical simulation, 4 preferring the lecture (13.3 %) and 4 having no preference (13.3 %). Students commented that sessions "worked well together" (Student 2) and that "Simulation is more practical, but both lecture and simulation provide what we need as student Radiographers - knowledge and experience" (Student 3).

Table 1
Knowledge in dementia scale scores.

	N	Mean	SD	Z	Sig
DKAT2 T1	30	10.99	3.59	−3.912	<0.001
DKAT2 T2	30	14.99	3.67		

Table 2
Confidence in dementia scale scores.

	N	Mean	SD	Z	Sig
CODE T1	33	27.36	7.03	−3.918	<0.001
CODE T2	30	35.36	5.06		

Table 3
Attitudes in dementia scale scores.

	N	Mean	SD	Z	Sig
DAS T1	33	97.38	16.02	−1.796	0.073
DAS T2	30	102.30	11,82		

Discussion

The dementia education significantly increased student radiographer's preparedness to care for people with dementia, also their knowledge and confidence of dementia. Students reported an increased confidence in providing a sense of safety for people with dementia and enhanced confidence in communication. As indicated in students' qualitative comments, a common barrier to students' confidence is the short timescale of the patient–practitioner interaction. While the Society of Radiographers[27] guidance suggests that the organisational culture of departments should be flexible and enabling to better support person-centred care, this is not often reflected in the experiences of people with dementia[9] or students on placement in practice environments. Alongside dementia education for students, there needs to be service enhancements to support imaging staff and students to provide person-centred care, for example by providing more time during imaging, and ongoing support and training for staff.

Students' knowledge significantly increased, particularly related to identifying different types of dementia and the positive impacts the environment can have on people with dementia (e.g. putting on a CD, opening or closing blinds). A gap in the provision was the absence of education on the identification and management of delirium superimposed on dementia (DSD), as indicated by students' sustained lack of knowledge related to confusion and dementia. Diagnostic radiographers play a part in identifying delirium, and frequently encounter patients who experience acute confusion or distress.[9,28] Proficiency in delineating dementia from acute confusion to determine appropriate acquisition technique and communication strategy is therefore crucial. Students also sought further knowledge on how to communicate effectively with people with dementia to avoid or reduce their agitation.

There was a positive improvement in the student radiographer's attitudes towards dementia following the education, however this was not found to be statistically significant as baseline scores were relatively high. Research suggests that qualified radiographers' attitudes towards dementia is variable.[12,29] Comparable research and findings related to attitudes amongst paramedic science students,[30] and indeed amongst trainee allied health professionals,[31] suggest that personal traits of high self-efficacy, resilience and determination could contribute to enhanced positive attitudes towards their care practice. However, it may also reflect a methodological problem with self-reporting[32] and further research using more exploratory methods could add depth to the findings.

Positively, students identified the education prepared them for their role as a radiographer. Another strength of the education was the combination of both taught (lecture) and practice (simulation) modes of delivery. High fidelity simulations, supported by comprehensive debrief,[17,33,34] support the development of complex communication skills by removing common barriers in diagnostic examinations such as the short timescale of the patient–radiographer interaction.[35] Simulation bridges the gap between theory and real-life clinical practice.[36] Including a variety of simulated experience in future iterations, for example x-ray related to a fall, may provide additional learning opportunities.

Students identified the involvement of experts by experience as a key strength of the education. Integrating lived experiences into radiography education enhances the learning experience, allowing students to cultivate person-centred and values-based approaches to care.[37–39] The Society of Radiographers[18] recognises the need to include people with dementia and their supporters in the provision of dementia training and ensure their voices are prioritised. The online pre-brief lacked comprehensive information about the involvement of the experts in the delivery of the education, which requires future enhancement. While experts were supported by an experienced dementia educator, more experts by experience will be recruited to support the simulation to prevent over-burden. There is scope to involve experts by experience in the design of the education. True co-production ensures that the content of the education is relevant, culturally sensitive, and addresses the perspectives and preferences of people with dementia.[37]

Limitations of the study

The experiences identified by a small group of experts within the locality of the higher education institution limited the generalisability of experience. We therefore acknowledge that this, in conjunction with being a single site study, limits the generalisability of the research. Furthermore, the participant group is small and relatively homogeneous so may not be fully representative of the national diagnostic radiography student population. However, the demographics of the sample reflect the ethnically diverse and female-majority diagnostic radiography workforce.[40]

The timeline of data collection with respect to each element of the education provision may have biased participants reported preference for the simulation education session. The post-intervention survey was released immediately after the cohort received the simulation education whereas the lecture session was 1 month prior, and therefore may not be as readily recalled. The relative impact of each element of the education provision is unknown.

Participants attend clinical placement weekly and may have interacted with people with dementia and their supporters. This additional learning opportunity may have contributed to improved scores and a positive shift in students' preparedness which has not been accounted for within this analysis. Correlation between prior education and experience with outcomes and evaluation of the long-term impact, retention and application of acquired knowledge and skills remains outstanding. There is scope to validate the efficacy of the education provision in meeting patient needs in the clinical context going forward.[41]

Conclusion & recommendations

Undergraduate diagnostic radiography programmes must incorporate effective dementia education to equip the future workforce with the knowledge, skills and confidence to effectively care for people with dementia. Fundamentally, dementia education must embed elements of co-production to ensure that the voices of experts by experience are represented. The findings from this study advocate for the integration of combined theory and simulation-based dementia education into diagnostic radiography curriculums.

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Declaration of interest

None.

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