

Radiographers' experiences in working with patients living with dementia in Norway – A qualitative study

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ABSTRACT

Introduction: Imaging departments are seeing an increase in the number of patients living with dementia (PWD), driven by the ageing population and diagnostic benefits offered by medical imaging. This study explored radiographers' experiences during imaging examinations for PWD.

Methods: A semi-structured interview guide comprising questions about radiographers' experiences, knowledge concerning PWD, challenges faced, and departmental initiatives was developed. Eight radiographers were interviewed, four working in MRI or general imaging, including CT and four in nuclear medicine, at three hospital trusts in Norway. Data analysis was conducted using inductive content analysis as described by Elo and Kyngäs, following a three-step process of preparation, organising and reporting. The qualified radiographers coded, categorised, and defined the themes and sub-themes to report on the findings.

Results: Three main categories emerged: 1. Radiographers' experiences, which included overall challenges and the radiographers' attitudes. 2. Measures undertaken, outlining the actions radiographers take during procedures, and 3. Competencies, highlighting the knowledge possessed by radiographers. Organisational challenges, such as the absence of overarching protocols and insufficient training for radiographers related to PWD, posed difficulties in effectively conducting procedures. Creating a calm environment, collaborating with caregivers, scheduling adequate time for examinations, and possessing good communication skills were viewed as facilitators for conducting examinations successfully.

Conclusion: Radiographers perceived imaging of patients living with dementia to be generally uncomplicated. However, challenges in planning for and communicating with patients, particularly for advanced examinations or acute settings, were reported. Establishing dementia-friendly departments and training radiographers in specific communication techniques could be beneficial.

Implications for practice: There is a need for more dementia-friendly imaging departments and communication training for radiographers working with PWD.

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Introduction

The increase in the ageing population over the past decades has contributed to a growing number of people living with dementia, and this trend is expected to continue.¹ More than 55 million people worldwide are currently living with dementia, ranking it as the seventh leading cause of death among older people.^{1,2} Dementia is an umbrella term for several different diseases. Alzheimer's disease is the most common, contributing to 60–70% of the cases. Other major forms include vascular dementia, Lewy

bodies dementia, and frontotemporal dementia. In addition, mixed forms of dementia exist.¹ Dementia is a progressive disease affecting memory, behaviour, and other cognitive abilities. This interferes significantly with the affected person's ability to carry out routine daily activities.¹

To diagnose dementia, diagnostic imaging is often used to characterise the type of dementia or exclude other possible causes for cognitive impairment.³ The commonly used diagnostic imaging are magnetic resonance imaging (MRI) and positron emission tomography (PET) using fluorodeoxyglucose ¹⁸F-FDG.³ In addition, individuals living with dementia tend to have a higher incidence of comorbidities,⁴ requiring additional imaging compared to similarly aged healthy individuals.⁵

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In imaging departments, radiographers are professionals who regularly interact with patients and play a vital role in meeting the needs of individuals living with dementia.^{5–8} Earlier research reveals that radiographers lack sufficient knowledge, communication competencies and proper care skills for individuals living with dementia, often exhibiting negative attitudes toward this patient group.^{5–9} Internationally, there appears to be a lack of education and training for radiographers about dementia and the care of this patient group.^{5–11} The experiences and competence of Norwegian radiographers in managing individuals living with dementia are unknown, warranting the need to explore and tailor future education and training programs for both qualified radiographers and students. This study aimed to explore radiographers' experiences during imaging examinations for patients living with dementia (PWD) in Norway. This topic was explored using the following research questions:

- How is working with PWD experienced by radiographers in Norway?
- How do radiographers accommodate PWD to perform safe and high-quality imaging examinations?
- Do radiographers feel competent and adequately trained to work with PWD?

Methods

Semi-structured qualitative interviews were conducted to gather in-depth data on radiographers' experiences with PWD.

A small team of researchers conducted this study. They were all female radiographers/radiotherapists with extensive experience in the clinical field, currently working full-time at an academic institution. EKXXX and CCCXXX are both experienced researchers. In addition, two groups of four female bachelor degree-level students were trained to conduct the physical interviews and transcribe them as part of their final bachelor project (See Acknowledgements).

Table 1
Interview guides with main themes and possible follow-up themes.

Interview guide nuclear medicine		Interview guide general imaging/CT/MRI	
Main theme	Possible follow-up themes	Main theme	Possible follow-up themes
First, please tell us about your experiences with examining people living with dementia	- What would you do to adapt the examinations? - Do you have any specific procedures related to dementia? - Are carers included in the examination, and how?	First, please tell us about your experiences with examining people living with dementia	- What would you do to adapt the examinations? - Do you have any specific procedures related to dementia? Are next of kin included in the examination, and how?
Could you please tell us more about your challenges in examining people living with dementia?	- How are you made aware of the patient having dementia? - Does the patient get enough information about the examination? - Do these examinations take up more time than with other patient groups? Do you plan for extra time? - Other challenges, claustrophobia, acting out behaviour?	Could you please tell us more about your challenges in examining people living with dementia?	- Information - Time - Environment - Carers - Acute/scheduled examinations - Safety
Do you feel that you have enough knowledge/experience to work with people living with dementia?	- How about other radiographers in the department? - Did your education focus enough on dementia? - How was your experience as a new radiographer?	Do you feel that you have enough knowledge/experience to work with people living with dementia?	- How about other radiographers in the department? - Strategies for adapting examinations - Communication techniques
What initiatives would you like to see in the department to make it safer and easier to do high-quality examinations of people living with dementia?	- Did you receive any additional training in the department?	What initiatives would you like to see in the department to make it safer and easier to do high-quality examinations of people living with dementia?	

Recruitment of participants

Radiographers working in various imaging modalities, including general imaging, computed tomography (CT), MRI and nuclear medicine (NM), were invited to participate, thereby encompassing all typical imaging modalities. The NM departments usually have a staff of 1–6 radiographers, whereas the hospitals employ an average of 40–50 radiographers in general imaging, CT and MRI. An invitation letter was sent to the imaging department in three hospitals in Norway. The department managers forwarded the invitation to all radiographers, requesting volunteers to participate in the study. Those who met the inclusion criteria were then asked to complete a consent form. The inclusion criteria were qualified diagnostic radiographers with experience conducting examinations involving PWD. After obtaining consent, interview schedules were arranged and tailored to the participants' preferences. Recruiting radiographers was challenging, prompting the distribution of several reminder emails to encourage participation.

Data collection

EK developed a semi-structured interview guide, which was piloted, further refined, and adapted in collaboration with the bachelor's degree students. The final interview guide was adapted to fit the different imaging modalities. Table 1 shows the two adapted approaches.

The students conducted the interviews, with EK acting as an observer in the first interview for each group. The interviews lasted, on average, 30 min and were conducted at the participants' place of work. All dialogue in the interviews was recorded using "Nettskjema-Dictaphone," an application developed by the University of Oslo (<https://www.uio.no/english/services/it/adm-services/nettskjema/help/nettskjema-dictaphone.html>) for safely recording audio using smartphones.

Table 2
Details of the analysis process.

Main phases	Description of phase	Actions made in phase
Preparation	<ol style="list-style-type: none"> 1. Choosing unit of analysis 2. Deciding on manifest or latent analysis 3. Familiarization 	In collaboration, all authors decided: <ol style="list-style-type: none"> 1. Unit of analysis: whole interviews 2. Manifest analysis 3. All authors familiarised themselves by listening to the interview recordings and reading the transcripts
Organising	<ol style="list-style-type: none"> 1. Open coding of analysis units 2. Create categories 3. Create main categories with subcategories 4. Abstraction of data 	<ol style="list-style-type: none"> 1. All authors contributed to open coding. 2. Through team discussions, categories were created. 3. Through team discussions, main categories and subcategories were created. 4. A general description of each category was written by all authors and discussed in team meetings
Reporting	<ol style="list-style-type: none"> 1. Description of the analysis 2. Reporting findings supported by quotes found in the data. 	<ol style="list-style-type: none"> 1. EK wrote the analysis description, and the descriptions were discussed and amended in team meetings. 2. All authors contributed to drafting the findings with quotes, and the descriptions were discussed and amended in team meetings.

Data management and analysis

All interviews were transcribed verbatim by the students. Data analysis was conducted using inductive content analysis as described by Elo and Kyngäs.¹² The analysis process follows three phases: 1) Preparation, 2) Organising and 3) Reporting. The three authors categorised, compared, and reviewed the emerging themes, which were later discussed. Details on the analysis process used in this study are presented in [Table 2](#).

Ethics statement

Participants volunteered and provided informed consent for participation and the publication of findings. The Norwegian Agency for Shared Services in Education and Research approved the handling of personal information – project reference number 155338.

Results

Eight radiographers (four males and four females) from three distinct hospitals were included in the study. Four worked in NM, three in MRI, and two in general imaging/CT, including mobile radiography services. One radiographer worked in both MRI and general imaging. One participant worked in a university hospital, while the other seven worked in larger regional hospitals. The analysis of the data collected from the interviews resulted in three main categories with two to five subcategories, as shown in [Fig. 1](#).

The radiographers' experience

Attitudes

The radiographers reported observing an increasing number of patients living with dementia referred to the imaging departments and emphasised an increased need for care and attention in this

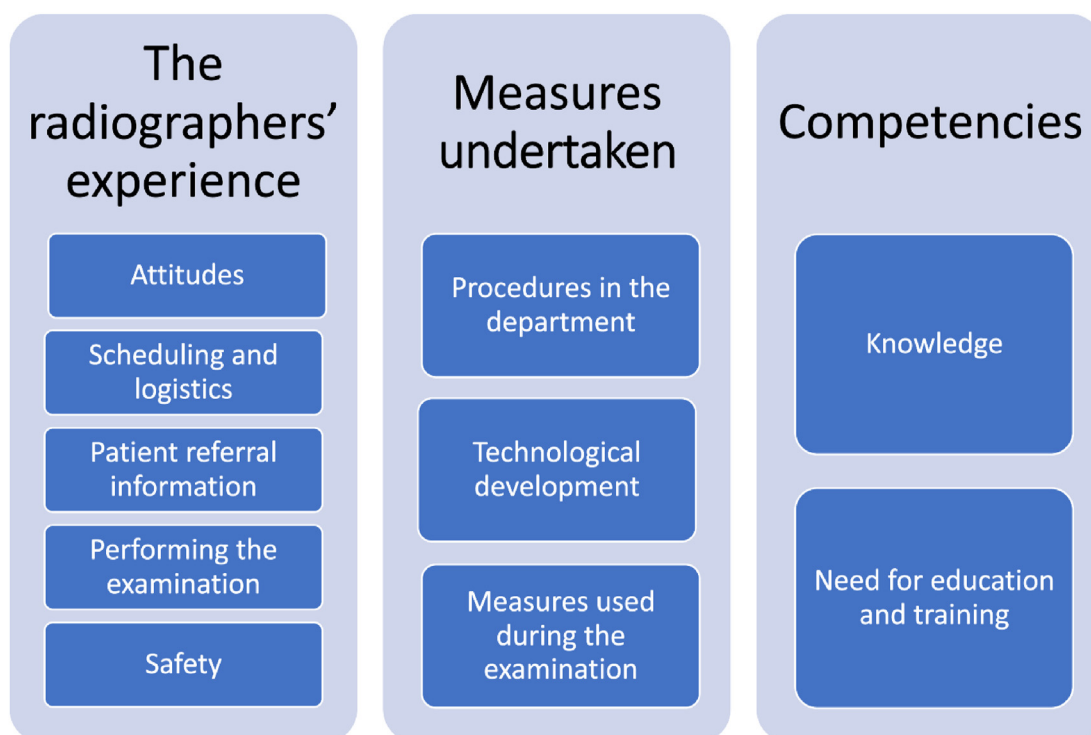


Figure 1. An overview of the higher-order heading and subcategories emerging from the analysis.

patient group. The radiographers stated that these patients were well cared for during their brief stay in the imaging department. The radiographers further expressed that they encountered patients with varied levels of dementia. Furthermore, the radiographers highlighted that these patients frequently experienced fear and restlessness. In some instances, the patients would be disoriented and unaware of the purpose of their visit to the department. Diverse attitudes towards PWD were also evident among the participants. For example, one radiographer prioritised ensuring the patient's positive experience in the imaging department, while another displayed a slightly negative attitude toward PWD. Most respondents, however, showed a compassionate attitude towards this patient group and emphasised the significance of treating the patients with common decency. One radiographer working in MRI expressed that:

“It’s all about how you meet them. Common decency, really. You need to think this is your grandfather or your neighbour”.

Scheduling and logistics

The radiographers in NM all mentioned challenges in scheduling and logistics for PWD. Due to the short half-life of the F^{18} used in PET, all patients needed to show up at the scheduled time. The NM departments regularly call patients the day before the examination to confirm their appointment. The radiographers expressed that confirming appointments with PWD could be challenging, as the patients can be forgetful or not understand the information given.

One radiographer in NM stated: *“It can be challenging just to call them in for an appointment; sometimes, you need to talk to their caregivers because not all of them are aware of the appointment given either by letter or over the phone”.*

An additional challenge was observed in the NM department when patients had to wait between the radiotracer injection and image acquisition. The radiographers stated that, typically, patients could be allowed to leave the department. However, due to safety concerns, radiographers would hesitate to allow a PWD to leave the department. Furthermore, allowing these patients to travel home alone post-examination was deemed unsafe. The radiographers stated that in such instances, they would try to ensure the patients' safe journey home by, for example, arranging for a patient taxi service. If a patient required an ambulance, the waiting time would be lengthy. In this case, the radiographers would ask for assistance from other departments to attend to the patient, particularly during after-hours periods. One radiographer in NM said:

“Sometimes, as we close at three [3 pm], and the patient has not yet been picked up, they have to wait in another department until the ambulance arrives”.

Scheduling adequate time for imaging procedures was reported to assist with patient preparation, allow the patients to get comfortable with the surroundings of the imaging department, and enable efficient workflow within the imaging department. One participant suggested that distributing appointments for patients with dementia over different days would promote workload efficiency.

In NM, the radiographers reported flexibility in scheduling, making it possible to schedule adequate time. However, they experienced that not all patients would require the extra time.

One radiographer working in NM stated: *“I have seen that there is a need to set aside time or to distribute patients with dementia over different days so that they are not all on the same day.”*

Patient referral information

The radiographers reported that often information about the patient's dementia status is not documented in the referral. When the requested examination is specifically for diagnosing dementia, radiographers would usually be informed or aware. However, this is seldom stated for other examinations. The radiographers note that they typically gather information through conversations with and observing the patient and finding ways to conduct the examination most effectively. Sometimes, they refer to earlier referrals or the patient's medical record to ascertain the patient's condition or diagnosis. The radiographers, however, expressed that this lack of information poses a challenge in managing PWD appropriately. One radiographer in general imaging said that:

“The referrer must write if the patient is living with dementia or has Alzheimer’s, so I can prepare how to communicate so that they will understand what I tell them to do.”

Performing the examination

The radiographers generally thought examining PWD went well, especially short and prebooked examinations such as brain MRIs. However, sometimes there were challenges, such as patients being restless or acting out verbally or physically. The radiographers found it challenging to know whether the patient understood the information given or whether they had forgotten what to do. The participants also reported that the imaging department environment, such as noise, stress, unknown people, and equipment, caused fear and restlessness for some patients. These challenges often increase examination time, pressuring the radiographers, especially in acute settings or during tight schedules. One radiographer in CT explained:

“You tell them to lay still, then you go out of the room, but then after 3 seconds they start, you know they don’t remember or don’t understand, so they start pulling on their blanket or touch the CT-gantry ... but I think it is because they are scared. Some also try to hit you, but that is mostly when helping them move from the bed and over to the CT couch”.

Safety

The radiographers experience that adherence to patient safety is difficult as giving information to and collecting data from PWD could be challenging. For example, when administering iodinated contrast media and when going through the MRI or PET checklists. Specifically in PET, the radiographers stated that it was difficult to know whether the patient had fasted as instructed, and most experienced that PWD often had too high a blood sugar level, posing a contraindication to proceed with the examination. To ensure patient safety, one radiographer in MRI specifically reported that radiographers usually review previous images or read the patient's medical notes to check that the patient has no metal implants. One radiographer in MRI stated: *“They don’t always remember if they have a stent or a hip implant, and that is critical when it comes to MRI ... we can go through previous examinations to check, of course also listen to the patient, but you have to be careful, they don’t always remember.”*

Measures undertaken

Procedures in the department

The radiographers mentioned that there are generally no protocols to follow when dealing with PWD. Therefore, radiographers

make decisions based on encountered situations and the patient's condition. A radiographer in NM explained that the radiographers read the patients' medical records carefully to find out more about the patient before they arrive. In addition, they are working on establishing a procedure where the NM radiologist obtains more information on the patients' specific dementia condition during referral assessment. The radiographer specifically stated that:

"We are working on getting the doctors to find information about dementia in advance, and the radiographer will try to find it [information about patients' dementia diagnosis] in the medical records or read between the lines in the referral."

Technological development

The current technology allows for faster imaging time and techniques. This makes it possible to reduce the average imaging time, adapt to the patient's anatomy, and minimise the duration of the procedure. The radiographers, however, stated that although advanced technology assists with managing PWD, it still has some challenges. The use of fast imaging protocols may result in low-quality imaging. As pointed out by a radiographer in MRI:

"We can use fast sequences and more robust protocols, which may result in lower image quality, but we still manage to obtain images. However, I find it rare that we fail."

Measures used during the examination

The radiographers highlighted different measures or techniques that could be used to ensure that examinations are conducted successfully. These comprised effective communication, adjusting the procedure room surroundings, or sedating the patient, particularly in cases of claustrophobia. The radiographers suggested communication techniques that involved reassuring the patient and building trust. However, care and assessment of using this technique for individual patients are required. Some radiographers specifically suggested that using music as a calming mechanism generally works for PWD. One radiographer working in MRI stated:

"Music can be useful for many patients. We play the radio or some older music. However, they can decide whether they want music or not."

The radiographers reported that getting the patient as comfortable as possible, for example, by providing pillows for support to reduce discomfort and pain, can be helpful. Preventing distractions by reducing noise and limiting the number of people involved in the imaging process was further stated as a critical factor in ensuring the patient is comfortable. One radiographer in MRI expressed that:

"I can imagine that it can be stressful if there are many people there and many stimuli. If we know that a patient has challenges, we can bring them into a quieter environment and minimise their wait time. Those who react to noise often have the least chance of completing the process."

The radiographers stated that most PWD are accompanied to the department by their caregivers, who could either be relatives, nurses, or home-based caregivers. These caregivers were viewed as valuable resources throughout the process, as they not only fostered a sense of safety for the patient but also supplied

additional and essential information about the patient. One radiographer in general imaging stated:

"If you have someone you know, that person can create a sense of security. Caregivers can provide additional information. We rely heavily on family members."

The patient should, however, be encouraged to actively participate and engage in the imaging process. The radiographers stressed the significance of not overlooking the patient in the discussion, as they must consent to the procedure. The radiographers, however, emphasised that caregivers should not be stressed or scared as this hinders the provision of the needed support for patients.

Competencies

Knowledge

Radiographers described themselves as experienced in encountering and interacting with patients in different situations. However, most radiographers stated they had little formal knowledge about dementia and communication strategies. It was highlighted that there were few lectures about dementia in their basic education. Furthermore, postgraduate study programs mainly focus on the technical aspects of radiography and not communication strategies. The general perception among the radiographers was that while additional knowledge could be beneficial, they felt confident handling PWD. One radiographer in MRI stated:

"I feel I have enough knowledge now in a radiographer setting. I would have liked to know more about dementia itself. But we radiographers are mostly good at meeting people."

The radiographers stated that their primary source of knowledge in caring for PWD came from their hands-on experience in the imaging department. They expressed that interacting with PWD was challenging in their early careers, but they have gained practical experience and learned from colleagues, providing reassurance and confidence in their work. Some radiographers also mentioned the value of working in nursing homes before becoming radiographers. One radiographer in NM said:

"The experiences you gain are through working. I don't have much knowledge about dementia and taking care of these patients, but I got a lot of experience on the job."

Need for education or training

The consensus among the radiographers was that formal education was needed to care for PWD. The radiographers state that their primary motivation for pursuing formal education was to ensure a safe environment for the patients. Onsite education and training were proposed as effective methods to increase knowledge about dementia, with a particular focus on communication techniques, as explained by a radiographer in MRI:

"Need to learn more, not necessarily about dementia, but about how to deal with those who have dementia."

Discussion

In this study, we analysed the radiographers' experience of imaging and caring for PWD within selected imaging departments

in Norway. Our study indicates a need to address processes within imaging departments to support the work of radiographers in better managing PWD. Our study shows that radiographers often handle situations spontaneously without planning for the patient's arrival at the department. Furthermore, the radiographers expressed a need for specific training in communication with PWD. This is reflected in earlier research,^{5–9} highlighting that radiographers lack adequate training in communication with and caring for PWD. Additionally, imaging departments are reported not to facilitate conducive environments or procedural processes tailored to this patient group,^{5–11,13} except for specific scan protocols in MRI and PET for dementia diagnostics. The lack of procedures appeared to affect the organisation of departmental processes, creating a sub-optimal environment and ineffective management of PWD. An optimal environment that limits stress and provides a calm and supportive atmosphere can contribute to better care and overall well-being of PWD.¹⁴ Griffiths et al.¹⁵ highlight the importance of continuity of people, places, and processes during cancer treatment for PWD. This is also applicable in imaging departments as it relates to efforts to provide familiarity and consistency in care. To plan and facilitate a positive patient experience, the radiographers need to be aware that the patient is living with dementia. Our study shows that this information is seldom included in the referrals. Imaging departments can generally be busy and sometimes noisy, thus potentially stressful for PWD. To better accommodate these patients, one could, for instance, consider providing a quieter waiting room and minimise the number of individuals present in the room. In addition, scheduling a longer time for the examination could be considered, even if the actual imaging acquisition time is short. These measures are reported in earlier research to contribute to a better experience for PWD and their caregivers.^{5,6}

Ineffective communication also emerged as a notable concern for patient safety relating to PWD in our study, particularly during MRI and NM procedures. Implementing specific departmental procedures and better communication systems and skills can facilitate easier access to patient information for radiographers, thereby ensuring patient safety and better workflow in the department.⁶

Generally, the radiographers interviewed in this study found managing PWD mostly unproblematic and stated that examinations are mainly conducted safely and successfully. Radiographers are reported to be experienced in handling brief, fast-paced, and hectic patient encounters, stressful environments, and unexpected situations.¹⁶ However, such settings often complicate communication.¹⁶ Earlier research has found that creating a sense of collaboration with PWD is essential in establishing effective communication and facilitating success in performing procedures.¹⁷ Furthermore, PWD and their caregivers reported a positive experience in imaging departments when their attending radiographer spoke slowly in a clear, calm voice, used a gentle touch, and made eye contact with the patient.⁶ In our study, the interviewed radiographers reported using these techniques and acknowledged their value in conducting examinations successfully for PWD. Involving caregivers during the examination process was also vital in our study. Earlier research indicates that caregivers can be a valuable support during imaging procedures, yet they are not consistently included in practice.^{6,8} The radiographers in our study acknowledged caregivers as invaluable support during the imaging procedures, provided they were not frightened. Higgins et al.¹³ also identify challenges associated with including caregivers, such as determining the appropriate timing for their involvement and considering the potential impact of their relationship with the PWD on provision of care.

Most radiographers in our study showed a caring attitude towards PWD. In some cases, however, their primary focus was on

obtaining high-quality imaging as quickly as possible, overlooking how the patient or their caregivers experienced the situation. Earlier research has shown that radiographers, especially those in earlier phases of their careers, have negative attitudes toward PWD.^{5–10} Education and training are necessary to improve attitudes and enhance staff knowledge and skills in providing optimal care for PWD.¹⁴ In line with earlier reports, the radiographers in this study seem to have a basic understanding of dementia and how to care for these patients. The radiographers expressed that their primary knowledge source has been working in healthcare services and observing and discussing cases with more experienced colleagues. This is further supported by Bisgaard et al.,¹⁸ who report that radiographers acquire new competencies in communication and creative positioning skills over time while working with PWD. All radiographers in our study desired further training in practical communication with this patient group. However, few indicated an interest in expanding their theoretical knowledge about dementia.

Strengths and limitations

This study interviewed a variety of radiographers across different areas of the imaging service, providing a possibility to explore different experiences and challenges in their interactions with PWD. However, individual interviews have limitations, as the data collected can be influenced by the interviewer's skills and the participant's motivation to enrol in the study, and the interpretation would be affected by the interpreter.¹⁹ In this study, two different interview teams were used. Thus, the quality of the interviews may vary between the teams. However, both teams were supported by EK, an experienced researcher who attended and guided the interview process for each group. The participants willingly volunteered after receiving information that was distributed to several radiographers. This might lead to mainly motivated radiographers stepping forward to enrol, driven by their critical perspective or particular interest in the topic. This could impact the quality of the collected data. On the other hand, we needed to send several follow-up emails to get enough radiographers to participate; thus, not all participants were especially interested in the topic. In this study, we observed that most radiographers expressed interest in adequately caring for PWD. However, there was also one radiographer with a more critical perspective, which added to coverage of diverse aspects and viewpoints. As this study is based on the experience and attitude of eight radiographers in public hospitals, our findings might not reflect the overall attitude and experience of all other radiographers in Norway or different settings. However, these findings align with findings from other countries relating to experienced challenges^{5–11} and could thus be relevant internationally and in other hospitals in Norway. Another notable limitation is that this study does not include the experiences of patients or caregivers, which could have provided a broader perspective.

Conclusions

In this study conducted within imaging departments in Norway, radiographers mainly reported their experiences working with PWD as commonplace and generally unproblematic. However, challenges were observed in communication, planning, and completing examinations, particularly in more advanced examinations or acute settings. The radiographers stated that they rely on practical experience to create a calm environment and adapt their communication to accommodate PWD; however, additional training in communication techniques is still warranted. As the number of PWD is anticipated to increase, there will also be a growing demand for imaging within this patient group. To address

this challenge, imaging departments must support radiographers, facilitating their ability to offer improved care for PWD through training. Furthermore, imaging departments should establish a dementia-friendly environment, offering flexible scheduling, providing information to caregivers, and implementing procedures for referring clinicians to include details about dementia and the patient's cognitive competence in the referral.

Ethics approval and consent to participate

Ethics approval was deemed unnecessary according to national regulations in Norway “Lov om medisinsk og helsefaglig forskning (helseforskningsloven)” <https://lovdata.no/lov/2008-06-20-44>. The Norwegian Agency for Shared Services in Education and Research approved the treatment of personal information – project reference 155338. All methods were carried out in accordance with relevant guidelines and regulations. Informed consent was obtained from all subjects.

Consent for publication

All participants have given consent for publication.

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author upon reasonable request.

Authors' contributions

EK – Planning, collecting data, analysis, drafting and revision of the manuscript.

CE - Planning, analysis, and revision of the manuscript.

CCC - Planning, analysis, and revision of the manuscript.

All authors read and approved the final manuscript.

Conflict of interest statement

The authors declare that they have no competing interests.

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List of abbreviations

CT Computed tomography

MRI Magnetic resonance imaging
 NM Nuclear medicine
 PET Positron emission tomography
 PWD Patients living with dementia

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