

Reporting radiographers in Norway – A qualitative interview study

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ABSTRACT

Introduction: A number of Norwegian radiographers have attended an advanced programme of education and training in musculoskeletal reporting, some in the UK and some in Norway. The aim of this study was to examine how reporting radiographers, radiologists and managers experienced the education, competence, and role of reporting radiographers in Norway. To our knowledge, the role and function of reporting radiographers in Norway has not yet been explored.

Methods: The study had a qualitative design and was based on eleven individual interviews of reporting radiographers, radiologists, and managers. The participants represented five different imaging departments from four hospital trusts in Norway. The interviews were analyzed using inductive content analysis.

Results: The analysis identified two main categories: “Education and training”, and “The reporting radiographer”. The subcategories were: “Education”, “Training”, “Competence”, and “The new role”.

The study found the program to be demanding, challenging, and time-consuming. However, the reporting radiographers described it as motivating because they gained new competence. The competence of reporting radiographers was regarded as adequate. The participants found that reporting radiographers had a unique competence in both image acquisition and reporting, and they were described as a missing link between radiographers and radiologists.

Conclusion: Reporting radiographers are experienced as an asset for the department. Reporting radiographers not only contribute to musculoskeletal imaging reports but are also important for collaboration, training, and professional development in imaging, and in collaborating with orthopedics. This was seen to increase the quality of musculoskeletal imaging.

Implications for practice: Reporting radiographers are a valuable resource in image departments, especially in smaller hospitals where the shortage of radiologists is noticeable.

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Introduction and literature review

The increase in the use of medical imaging over the last decades combined with a shortage of radiologists has led to imaging acting as a bottleneck in the health services.^{1–3} One of the measures used to improve the effectiveness of imaging has been to train radiographers in image reporting – known as reporting radiographers.^{2,4} In the UK, this position was introduced in the 1990s, and other countries such as Australia and Denmark have followed the UK's example.^{2,5} In the early 2000s, a few hospitals in Norway sent radiographers to the UK

for advanced education in musculoskeletal image reporting as the hospitals needed their competence. In 2016, an advanced education and training programme in musculoskeletal imaging for reporting radiographers was established in Norway, based on the education established in the UK.⁶

The Norwegian programme is similar to the programmes in the UK, combining theoretical education in anatomy, physiology, pathology, with practical training in “cold” reporting under guidance from a mentor (radiologist).⁷ A >90% reporting accuracy is required to graduate.⁶

With the introduction of reporting radiographers, radiologists have been concerned about the quality of reports made by radiographers as they do not have a medical degree. Thus, the accuracy of reporting radiographers has been explored and compared to that of radiologists. According to Buskov et al. and Brealey et al.,^{2,8} there

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are minimal or insignificant differences between the two professions in the quality of the reporting of skeletal plain X-ray examinations.

Even though reporting radiographers mainly report images, they have a mixed competence with knowledge in both image acquisition and reporting. They could therefore also fill other roles, such as guiding radiographers on patient positioning, developing procedures, discussing patient cases with clinicians, and teaching.⁹ In addition, assuming the role of an advanced practitioner can lead to increased job satisfaction.¹⁰ However, to the best of our knowledge, the role and function of reporting radiographers in Norway has not yet been explored.

This study is part of a larger, novel project evaluating reporting radiographers in Norway. The aim of this study was to explore how reporting radiographers, radiologists and managers experienced the education, competence, and role of reporting radiographers in Norway. In this paper we will explore the following research questions: 1) How is the advanced education and training programme for reporting radiographers experienced? 2) How is the reporting radiographers' role and competence perceived in Norwegian hospitals?

Methods

Study context

The Norwegian health services are mainly provided by the public sector, based on general taxation. Hospital trusts are largely responsible for specialized healthcare, including imaging services, while in the largest cities there are also private imaging centres.¹¹ The lack of radiologists affects the capacity of the imaging services, leading to increased waiting and reporting times. Training reporting radiographers has been suggested as one of the measures to address this situation, but radiologists are resisting this development.^{1,12} Reporting radiographers in Norway are educated in the UK or Norway. At present, there are 20–30 reporting radiographers in Norway, employed at public hospitals. The first reporting radiographers educated in Norway graduated in 2017.¹²

Participants

This qualitative study with a descriptive approach¹³ included five reporting radiographers with advanced training in image reporting (three educated in Norway, two in UK), three radiologists (working as a mentor or close to reporting radiographers), and three managers from imaging departments that employ reporting radiographers. Six participants were female, five were male. The participants represent five different imaging departments from four hospital trusts. A total of eleven individual semi-structured interviews were conducted.

Sampling and data collection

An invitation letter was sent to hospital trusts known to have reporting radiographers on their staff, inviting relevant employees of the imaging department to volunteer. To volunteer, participants needed to contact the author (AB). After checking the inclusion criteria, AB e-mailed an information letter and consent form to the potential participants. When the signed consent form had been returned to AB, the interview was set up.

The interviews were conducted as a conversation using a semi-structured interview approach to secure an open conversation and to cover all relevant topics. Three interview guides were developed by all authors, individually adapted to the different participant groups. The questions were then discussed in a multi professional

research group for feedback and revision. The interview guides are given in [Table 1](#).

Interviews were conducted in September 2020–January 2021, using Zoom (Zoom Video Communications, Inc., San Jose, USA) or telephone as the Covid-19 pandemic prevented meeting face-to-face. Interviews were audio recorded using a digital recorder (Olympus digital voice recorder WS853). All interviews were conducted by AB (radiographer), and EK (radiographer) participated as an observer in the first two interviews for quality assurance. Notes were taken during the conversation to ensure that all relevant topics were covered and to provide relevant follow up questions. The interviews lasted on average 40 min (20–60 min).

Ethical issues

The project was approved by the Norwegian Centre for Research Data (reference no. 746441) and the data protection official at each hospital. As there are few reporting radiographers in Norway, it was important to ensure the participants' anonymity, thus detailed information about each participant was not presented.

Analysis

The inductive content analysis method described by Elo and Kyngäs¹⁴ was used. This method includes three main phases: preparation, organization, and reporting. Details on the analysis process are presented in [Fig. 1](#).

Results

Through analysis and discussion between the authors, the data on the experience of reporting radiographers were divided into two main categories: “Education and training”, and “The reporting radiographer”, with two subcategories each ([Fig. 2](#)).

Education and training

Education

The education and training of reporting radiographers and the course assessments were experienced as demanding. The participants agreed that the level of knowledge must be high, as the

Table 1
Interview guides.

Reporting radiographer	Radiologist	Manager
First, I would like you to talk about your experience of the training programme to become a reporting radiographer.	Can you please describe your experience as a mentor?	First, can you describe the process of deciding to have reporting radiographers in your department?
Could you describe the relationship with your manager and colleagues as a reporting radiographer?	How do you experience the competence of reporting radiographers?	Can you describe your experience of reporting radiographers?
Can you describe your work situation today?	What kind of changes have occurred because of reporting radiographers in the department?	Are there any plans for more reporting radiographers in the department?
Would you recommend others to become a reporting radiographer?	Would you recommend reporting radiographers to other departments?	Would you recommend reporting radiographers to other departments?

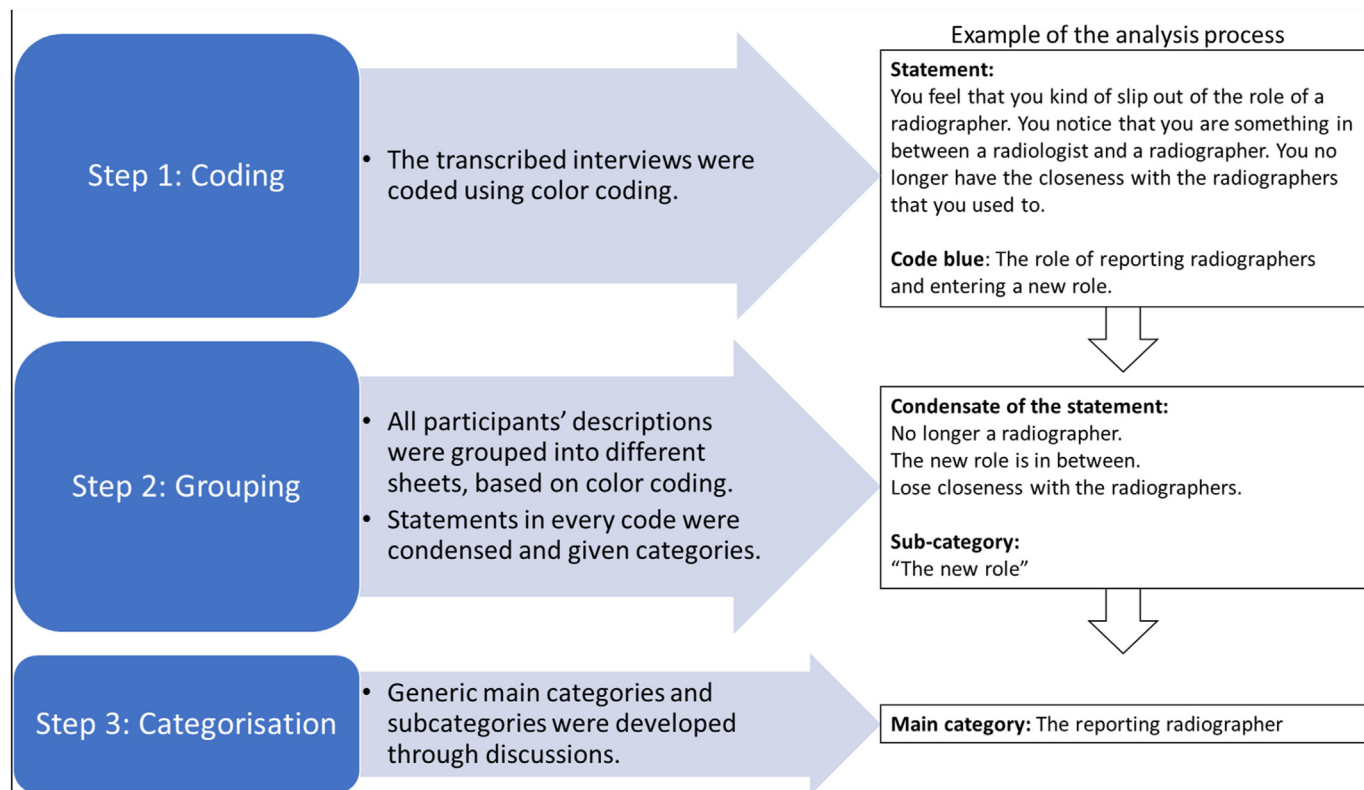


Figure 1. Overview of the analysis process.

reporting radiographer are going to perform on an equal level to radiologists.

The reporting radiographers educated in the UK and one of the mentors described the education as high quality, well-established, and professional. The reporting radiographers educated in Norway experienced the courses to be of high quality. However, as this was the first time this programme had been offered, it was pointed out that the organization of the courses could be improved. Radiologists also experienced that the education and training programme offered in Norway was on a very high professional level.

The course assessments were also described as challenging, and some radiographers failed the first time. This resulted in additional workload for the mentor and the department. One radiologist experienced difficulty in deciding when supervision should stop when a student failed the course. Furthermore,

another radiologist thought the level of the course assessment was unnecessarily high.

"... the course assessments were very demanding in the UK, there would be doctors that would struggle as well ... it was an exam with demanding cases and high quality." No. 2, Radiologist

Even though the programme was part time, the reporting radiographers described themselves as full-time students. All students combined education with working as a radiographer, and there was a variation in how the departments organized this. The large amount of self-study and a need to be independent was challenging. Nonetheless the reporting radiographers found the education motivating, and a positive experience.

"... you had to set aside that year because I studied in most of my waking hours, I had books with me all the time ... It was a pretty intense year." No. 7, Reporting radiographer

As the education is demanding, the managers pointed out that it was important to find the right candidate when choosing which radiographer should apply for the programme. It was seen as important to be skilled and have professional integrity. In addition, the department needed to support the reporting radiographers and give them the necessary confidence to succeed.

"I think the key is that there is support in the department. In addition, you need to send the right people [to the advanced education programme]." No. 11, Manager

Training

In practical training with a radiologist as a mentor, students were required to interpret and 'cold' report 1500 skeletal

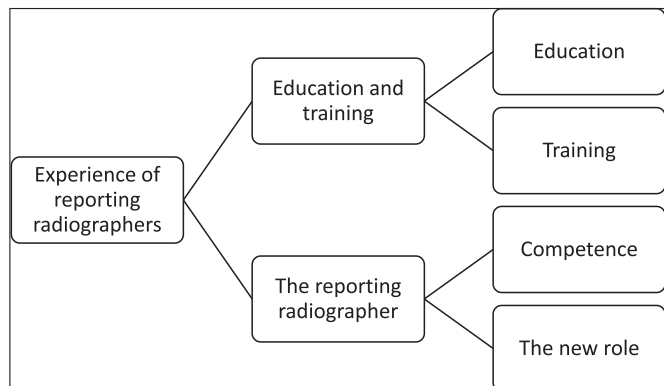


Figure 2. Main category, generic categories, and sub-categories developed inductively through the analysis.

examinations in their department. This took up most of the students' training time. Several of the reporting radiographers experienced the number of reports to be demanding and time-consuming compared to other learning activities. However, the learning outcome was considered high.

The departments organized the training differently. Some had mentoring days, others had to plan time with the mentor outside working hours. The mentors discussed selected cases with the students and reviewed the student's reports. The reporting radiographers perceived the mentor as crucial in enabling them to learn image reporting and wanted more time with them.

"We were two students and we discussed cases together with the mentor ... We chose cases we thought were especially interesting for discussions on mentor days. The mentor told us what they would have reported and how ... The mentor days were very important during our studies." No. 1, Reporting radiographer

The radiologists found the mentoring exciting, rewarding, demanding, and time consuming. The radiologists also described learning through the mentoring process. Some radiologists felt too much responsibility was put on the mentor and expressed a lack of support from the universities.

"Of course, sometimes there were questions I did not know the answer to, I couldn't answer and had to look it up. So, I learned a bit as well." No. 2, Radiologist

The reporting radiographer

Competence

The radiologists have a medical background and a clinical perspective on image reporting. The competence of the reporting radiographer was seen as having a unique competence combining knowledge in interpreting and reporting, but also how images are acquired. This combination was seen as novel and valuable.

"When they [radiologists] are teaching the radiographers, they only talk about findings and pathology in images, but they do not link it to projections ... So, in that area, I can make a good contribution and act as a missing link." No. 7, Reporting radiographer

"... in our [radiologist] education, we are not taught how the images are acquired. We know if it's a good image or not, but through mentoring I got a deeper understanding on image acquisition." No. 2, Radiologist

Overall, the reporting radiographers were experienced as competent and having sufficient knowledge at graduation. The reporting radiographers were scheduled to start reporting after graduating. However, their reports were quality assessed by a radiologist for a period after graduation, and in some fields such as paediatrics, the reporting radiographers were followed up more closely. The duration of the quality assessment varied, from three months to one year after graduation. One reporting radiographer began 'hot' reporting with quality assessment even before graduation. The quality assessment was set up to ensure patient safety. However, none of the radiologists or managers were afraid of major errors in the reports. The radiologists trusted the reporting radiographers and were confident that they would approach a radiologist if they needed help and support.

"No, I'm not afraid now, I think they [reporting radiographers] make good reports. The report seems very thorough, and they ask for help if they need it ... have nothing to complain about the report they make now." No. 2, Radiologist

Some reporting radiographers felt insecure when they started hot reporting and needed time to build confidence. Through experience, the reporting radiographers described how they came to realize that interpretation and reporting images is not an exact science, and that both radiologists and reporting radiographers sometimes need to discuss cases with colleagues.

"A lot of this is experience-based, and you should have seen lots of images before you feel completely safe. You may never feel completely confident, you must go through quite a few examinations before you can recognize normal from abnormal easily. Just after you have finished your education, there is so much information, so you kind of have to sort it out to get an overview." No. 4, Reporting radiographer

The new role

The role of the reporting radiographer included reporting, acquiring images, developing procedures, teaching, and collaborating with orthopaedists. It was emphasized by the participants that as the role of reporting radiographer is varied and demanding, you must have a certain professional self-confidence. This is needed to have confidence in your own decisions and to engage in professional discussions. Although such confidence developed through experience and training, it was also described as an inherent trait that is useful in this role. When mistakes were made, the participants found that the ability to handle the situation was important for reporting radiographers.

"... it is about professional understanding and self-confidence. One thing is to see what you should report on, in addition you must trust your findings. And, daring to take on a slightly larger number of examinations as well, that has to do with learning a little faster." No. 6, Radiologist

Developing the role of a reporting radiographer was experienced as a continuous process. How the department defined the role of reporting radiographer varied. However, almost all reporting radiographers combined reporting with working in the radiographer rotation. As a result, they alternated between two roles. Several of the reporting radiographers found their new role exciting, others needed more time to develop and feel safe in the new role. Several of the participants found that having a reporting radiographer in the department helped raise the status of radiographers in general.

"... reporting radiographers should have been like an octopus, sometimes in the clinic, maybe not working shifts, but been present during the day, both in the clinic and in a team with the radiologists." No. 7, Reporting radiographer

Some reporting radiographers said they had received comments that they are moving away from the role of a radiographer. This experienced distance seemed to be affected by how the department organized the work of the reporting radiographer. However, in general the reporting radiographers described having more contact with radiographers on a daily basis than radiologists. The reporting radiographers often gave feedback on image quality, or the radiographers contacted a reporting radiographer to discuss image quality and patient cases.

"You feel that you kind of slip out of the radiographer role. You notice that you are somewhere between the role of a radiologist and a radiographer. You no longer have the closeness with the radiographers that you used to." No. 8, Reporting radiographer

In departments with more than one reporting radiographer, their combined position led to little time to collaborate side by side.

They often worked alone because while one was reporting, the other was working in the clinic. The reporting radiographers expressed a need to work together to be able to discuss cases and support each other.

"It would have been better to work side by side, because then it's easier to ask the person next to you and have discussions." No. 1, Reporting radiographer

On the other hand, reporting radiographers also experienced that they could have professional discussions with radiologists. Both reporting radiographers and radiologists said that they work as a team when it comes to reporting. Furthermore, several participants emphasized that reporting radiographers raised the level of attention to skeletal X-rays in the department. This was experienced as positive as radiologists often focus more on advanced examinations such as CT and MRI.

"... we can also discuss with the radiologists, they are very open for questions, and sometimes the radiologists also come ... to ask for our opinion. I absolutely feel we are on equal terms, at least when we discuss specific examinations." No. 4, Reporting radiographer

The reporting radiographers reported that they frequently collaborated on and discussed cases with orthopaedists. They found this collaboration important in the development of skeletal examination procedures, even though they were not always responsible for the development of the procedures. In some departments, reporting radiographers were a key member of the team assessing and developing procedures from day one. In other departments, including the reporting radiographer in procedure development was controversial and led to conflicts with specialist radiographers.

"We have a dedicated radiographer working with procedures. I give him feedback relatively frequent on things that need to be changed, in relation to what the orthopaedists often refer to, and what kind of procedures we need to update." No. 5, Reporting radiographer

Another said

"... they [reporting radiographers] have clearly wanted to be part of the group, but it has taken time before they finally found their place. Now they are in the group." No. 2, Radiologist.

Furthermore, reporting radiographers stated that their extensive training in and daily focus on skeletal examinations in addition to being trained as radiographers, meant that they provided good backup for resident and junior doctors in the department. In addition, some contributed to the official supervision of junior doctors, and one experienced that reporting radiographers provided lessons for radiologists in skeletal reporting.

"I also get feedback from our junior doctors, they think my explanations are good, because I can explain how the images were acquired. They do not have that knowledge, and do not understand why it looks the way it does." No. 5, Reporting radiographer

Discussion

Education and training

The managers, radiologists, and reporting radiographers interviewed in this study had experience from the advanced education

programmes in either Norway or the UK. The programmes were described as both demanding and of high quality. Although they were set up as part-time studies, participants found that the courses and training took up far more time than planned. However, the hard work seems to have paid off as this study showed that the reporting radiographers were considered to have high competence and were respected in the departments, in line with earlier research.¹⁵

Both educational programmes used radiologists as mentors for students in clinical training. The mentors were described as both a teacher and a coach. The participants found the clinical training to be demanding but vital for their learning. In line with earlier research, reporting and discussing real cases in a clinical environment is of vital importance.^{16,17} However, as also shown in Cuthbertson,¹⁵ it was challenging to set aside enough time for mentoring, and several of the participants wished for more time with the mentor throughout their studies.

The objective of using reporting radiographers was to unload the pressure on radiologists. Thus, the reporting radiographer must be competent and independent in image reporting. Based on the debate on reporting radiographers in Norway,¹² there was a pressure on the newly established advanced education programme in Norway to deliver the same quality as the programmes in the UK and Denmark.^{2,8} The participants in this study found that the Norwegian educational programme held a high standard, and that the graduates had the expected competence, comparable to the UK graduates.

The reporting radiographer

The participants said that the introduction of a reporting radiographer created a new role in the department, as also reported in earlier research.^{3,9,18} Though the main task for the reporting radiographer was described to be reporting images, the reporting radiographer was experienced to have a unique competence, providing a missing link between radiologist and radiographer,³ thus contributing to increased quality of skeletal examinations through teaching, procedure development, and collaboration with radiographers, radiologists, and orthopaedists.

However, developing this competence took time. All reporting radiographers felt that they needed more experience and profited from feedback from a radiologist. The time needed to achieve independence varied. In Norway, the reporting radiographers were scheduled to start hot reporting as soon as possible after graduation. According to Cuthbertson¹⁵ and Henderson et al.,¹⁹ this was not always the case for reporting radiographers in the UK, where organizational barriers in the department hindered the graduates from practicing their new skills. Cuthbertson¹⁵ also states that reporting radiographers need full support from leadership and management on their journey from education to practice.

The reporting radiographers described a lack of peer support. They seldom worked side by side, thus making it difficult to discuss cases and cooperate. This is also known as a challenge from previous research, as reporting radiographers are in combined positions.^{15,20} The lack of time for reporting radiographers to work together could create a feeling of being alone and vulnerable in the new role. According to Woznitza et al.,²¹ although peer review is essential for high quality imaging service, this is not implemented in Norwegian hospitals.

As a reporting radiographer, you are expected to report independently and accurately on the same level as a radiologist.⁸ However, both radiologists and reporting radiographers will make mistakes in their reports.²² Thus, reporting radiographers need professional confidence, reflectivity, and independence. They must be able to stand up for themselves and

the choices they make but must also accept and learn from their mistakes.^{3,20} This study showed that the reporting radiographers were able to work independently and engage in discussions, and the radiologists trusted their work. In addition, the reporting radiographers have support from management, which helps them develop a professional confidence and to feel safe in their role.

Cuthbertson¹⁵ found that some reporting radiographers felt rejected by radiographers in their department. They sensed jealousy and got negative comments at work. This study has not found the same rejection in Norway. The reporting radiographers felt welcome in the department although some negative comments were reported. In Norway, most of the reporting radiographers work both as radiographers and reporting radiographers, so this might contribute to a lower resistance in the department.

Strength and limitations

While this study yielded rich data related to reporting radiographers working in Norwegian hospitals, there are nevertheless limitations that must be acknowledged. While rigorous data collection and analysis methods were employed, the sample size was relatively small and as with qualitative studies in general, the findings cannot be generalized to a wider population. In addition, using volunteer sampling could constitute a selection bias where the participants are more likely to be especially positive or negative to reporting radiographers, or be especially interested in the topic. The participants may not reflect the general opinion in the departments. Further research is needed on the organization of reporting radiographers in Norway as well as reporting accuracy.

Conclusions

In conclusion, the reporting radiographer's competence after graduation was experienced as adequate, regardless of where they had carried out their education and training. The advanced programme for reporting radiographers was experienced as a high quality, full-time program. It would be recommended that departments take time for self-study into consideration when planning to educate reporting radiographers. The mentors played a vital role in the training. Radiologists found the mentoring both demanding and exciting, and universities should find a way to support the mentor if a student is struggling during practical training.

Reporting radiographers were described to provide the missing link between radiologists and radiographers. Having a reporting radiographer in the department was found to increase the quality of musculoskeletal imaging. Assuming the role of reporting radiographer was experienced as both demanding and exciting, and there is a need for departmental support for the radiographers embarking on this professional development. Further, it is important to provide time for peer support for reporting radiographers.

Conflict of interest statement

None.

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