

Barriers to not informing patients about radiation in connection with radiological examinations: Radiographers' opinion

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ABSTRACT

Introduction: In some instances, little knowledge regarding radiological examinations is provided to patients. The purpose was to investigate whether radiographers inform patients about radiation, and if not, the reasons for it.

Methods: A questionnaire was sent to radiographers working in the public sector in Northern Finland. Radiographers were asked whether they had informed patients about the radiation dose and risks during the last year. If information was not provided, the reasons for it were investigated using multiple-answer type multiple-choice questions with the option for free text responses. The results were compared between a University Hospital and other departments and between different lengths of work experience. Altogether 174/272 (64%) radiographers responded to the questionnaire; 50% were from the University Hospital and 50% from other departments.

Results: Altogether 103/174 (59%) respondents did not inform patients about the radiation dose and 93/174 (53%) did not inform them about the associated risks. Regarding a passive approach to dose information, respondents thought that the referrer had already informed the patient (49/103, 48%), information was not needed (51/103, 50%), or it might cause unnecessary fear (47/103, 46%). Reasons for a passive approach to risk information were similar (66/93, 71%; 33/93, 36%; 47/93, 51%, respectively). Regarding the results, there were no differences between the institutions or work experience levels. According to the open question, some radiographers expected patients to ask questions before informing them. Lack of time was rarely mentioned as a reason.

Conclusion: The main reasons for inadequate information were ignorance regarding responsibilities, assumption that information is not needed, and concern about causing unnecessary fear.

Implications for practice: Education, guidelines specifying responsibilities and contents for information, and easy-access digital educational material for public and professionals are needed.

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Introduction

Justification of medical exposures to ionizing radiation is the process of weighing up the benefit of the exposure against the possible detriment that the radiation might cause. In diagnostic imaging, radiation-promoted carcinogenesis is the main concern.¹ The process of justification should concern each patient and each radiation procedure.² In the EU, both referrers and practitioners

share the responsibility for justification as specified by the Member States.³ The patients should also be involved in the shared decision-making process; they should be provided with sufficient information to allow them to provide informed consent.^{1–6} The practitioner or the referrer, as specified by the Member States, ensures that the patient is provided with adequate information relating to the benefits and risks. However, the practical aspects of patient information can be delegated to another entitled individual³ who is, in most cases, a radiographer. According to the previous EU directive, the practitioner was more likely to be responsible for giving information, but the practical aspects could be delegated as appropriate.⁷

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Guidelines for improved communication both among professionals and between professionals and patients have been published.^{2,8,9} However, little or no information is given to patients on these issues.^{10,11} Practical guidelines regarding patient information have not been available in Finland. It is also known that both referrers and professionals working with radiation often have limited awareness of the actual doses and risks of radiological examinations^{4,10,12}; this limits their ability to effectively communicate dose and risk to the patients, thereby limiting their ability to truly gain informed consent. Furthermore, the risks are perceived differently by experts and the public, and there is a substantial gap between patient expectations and current practices in providing information about ionizing radiation.⁸ Lack of time and concerns about causing undue anxiety or discouraging patients from having examinations may also prevent professionals from giving information.¹³ However, the reasons for not providing adequate information have not been comprehensively studied among radiographers.

A previous survey carried out among patients revealed that patients expect to obtain a diverse range of information, but they do not obtain adequate information from any source.^{14,15} The present study was undertaken to find out the opinion of radiographers regarding information: whether they have informed patients about the radiation dose and associated risks, and, in particular, if not, the reasons for it.

Methods

This study was performed in 2014 in the Department of Diagnostic Radiology, Oulu University Hospital (OUH), Oulu, Finland. The study was approved by the Institutional Review Board. A questionnaire for the study was developed by the authors in cooperation with a statistician. A pilot study was performed with a seven radiographer sub-sample. The Webropol survey link¹⁶ with information about the survey was sent by e-mail to all the radiographers working in the public sector in Northern Finland ($n = 272$). They were working at the University Hospital, in central or district hospitals or in the radiology units of health centres (called hereafter “University Hospital” and “other departments”). The cover letter included contact information and stated that participation was voluntary, confidential and anonymous. The recipients were asked to answer the questionnaire within four weeks and a reminder was sent after that time to give recipients four more weeks to reply.

The working years and place of work (as listed above) of the radiographers were captured. The working years were categorised into five groups: ≤ 3 years, 4–10, 11–20, 21–30 and more than 30 years. The aim was to find out whether there are any differences in the practice between the University Hospital and smaller volume units and whether the time of graduation or length of work experience might affect the results.

The survey assessed the practice during the last year. The radiographers were asked about their practice regarding oral patient information prior to examinations if the patients did not ask any questions. The radiographers were asked if they informed patients about the radiation dose or the associated risks. If the radiographer answered “no” the radiographer was invited to provide reasons; the options are shown in Fig. 2.

The questions related to information about the radiation dose and the risks were single-answer type multiple-choice questions while those concerning the reasons for not providing information were multiple-answer type multiple-choice questions. The options regarding the reasons were based on the literature and researcher experience.^{2,10,13,17} The respondents could also comment on the reason in an open question (“Some other reason, what?”). This

research study focuses on radiographers not providing information and on the reasons for not giving information.

The number and proportion of radiographers not providing information and of the reasons for not providing information were calculated and compared between the University Hospital and other departments and between the different work experience time categories by using a Chi-square test. The categorized length of work experience was compared between the University Hospital and other departments using linear-by-linear association. IBM SPSS Statistics 22 (IBM Corporation, Armonk, NY)¹⁸ was used to conduct the statistical analyses. The open question was analysed using content analysis and number counting; the answers regarding the radiation dose and the risks were categorized into different groups according to the contents (i.e. quantification).¹⁹

Results

Altogether 174/272 radiographers (64%) responded to the questionnaire. In all, 14% of the radiographers had a maximum of 3 years, 21% 4–10 years, 28% 11–20 years, 17% 21–30 years and 21% more than 30 years' experience of working as a radiographer. The work experience of the radiographers was longer in the other departments than in the University Hospital ($p = 0.019$). Altogether 87 (50%) radiographers were from the University Hospital and 87 (50%) from the other departments. The present survey also covers data about radiographers who did provide information (with relation to the radiation dose level of the examinations) but those results are not included in this report.

No information provided

In all, 103/174 (59%) respondents did not inform patients about the radiation dose and 93/174 (53%) did not inform them about the risks (Table 1). There was no statistically significant difference between the University Hospital and the other departments. Regarding risk information, the results differed between length of work experience ($p = 0.031$), but no overall pattern was demonstrated ($p = 0.122$) (Fig. 1). Regarding the radiation dose information, there was no difference in the results between work experience groups.

Reasons for not providing information

The three main reasons for not informing patients about the radiation dose or the risks were similar (Fig. 2). Regarding dose information, the following three reasons were chosen almost equally: radiographers thought information was not needed (51/103, 50%) or that it might cause unnecessary fear (47/103, 46%), or they assumed that the referrer had already informed patients (49/103, 48%).

The main reason for not informing about the risks was that the radiographers assumed that the referrer had already informed patients (66/93, 71%) (Fig. 2). Other reasons were the assumptions that information may cause unnecessary fear (47/93, 51%) or that

Table 1

Number and rate of the “No” answers dealing with radiation dose/risk information compared by radiographers' workplace.

	Total, n = 174	Institution		
		OUH ^a , n = 87	Others, n = 87	P ^b
Did not inform about dose	103 (59.2%)	55 (63.2%)	48 (55.2%)	0.355
risks	93 (53.4%)	52 (59.8%)	41 (47.1%)	0.128

^a Oulu University Hospital.

^b Significance from the chi-square test.

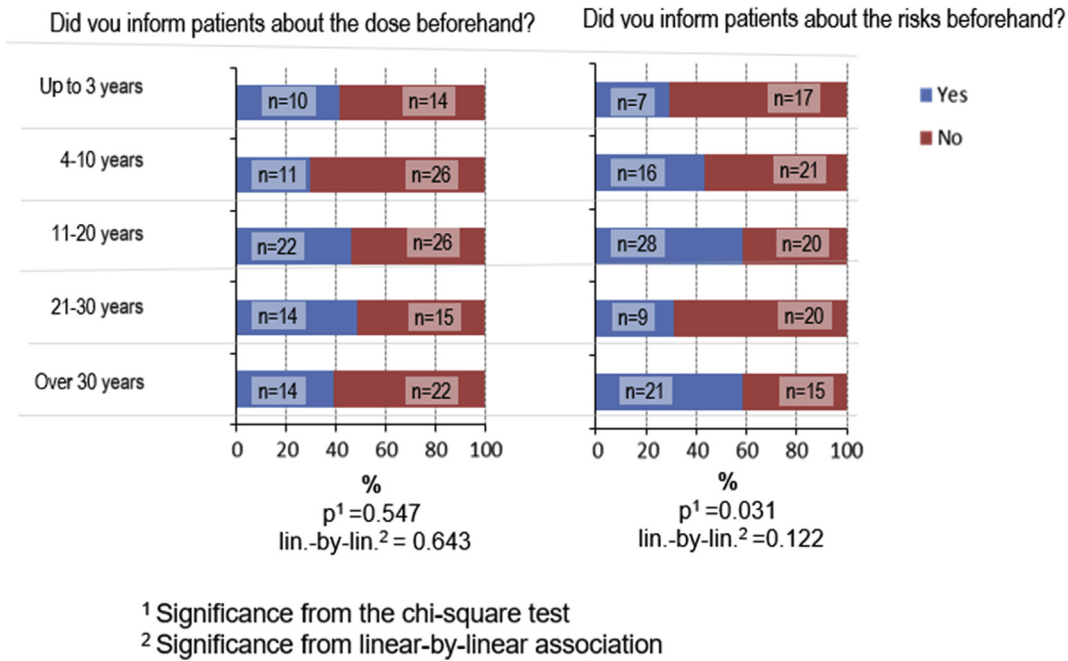


Figure 1. Number and rate of the “Yes” and “No” answers dealing with radiation dose/risk information compared by the work experience of radiographers in years.

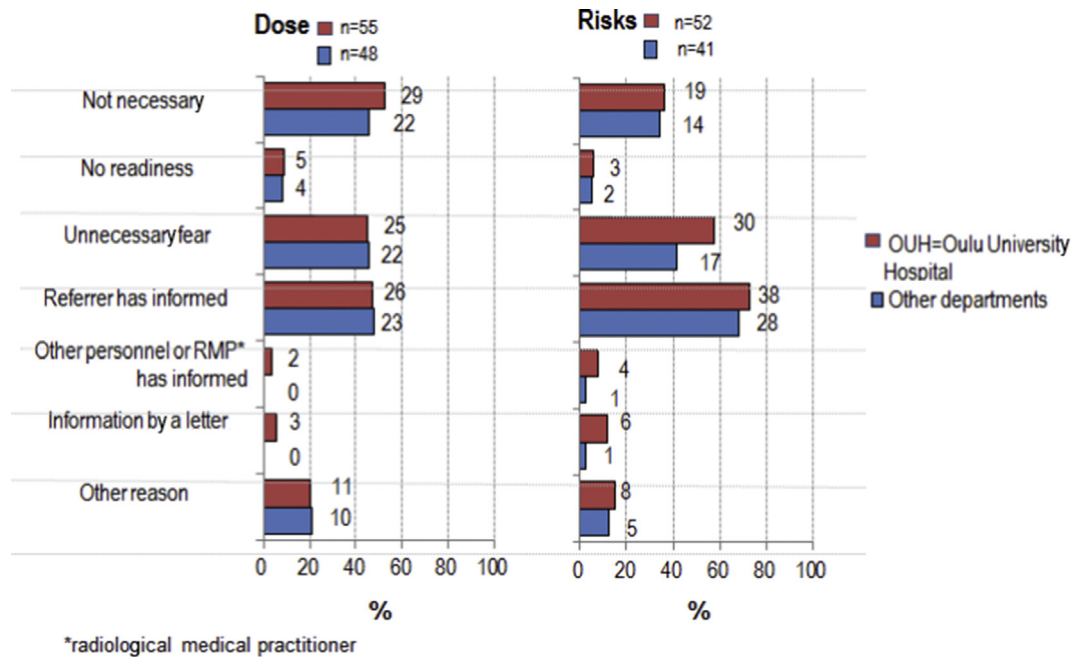


Figure 2. The different reasons for not informing patients about the radiation dose/risk of the examination beforehand, compared between the University Hospital and the other departments.

information was not needed (33/93, 36%). Regarding all of the reasons for not informing patients about the radiation dose or the risks, there were no differences between the institutions or groups with different lengths of work experience.

With regards to the open-ended question (“other reason”), 21/103 (20%) and 13/93 (14%) radiographers gave comments regarding the radiation dose and the risks, respectively (Fig. 2). The comments included one to three different aspects. If the comments were dealing with the alternatives provided in the list, they were excluded. The final comments and their numbers are shown in Table 2.

Discussion

According to this study, radiographers inform patients inadequately about the radiation dose and the risks. The assumption “referrer has already told” was a common reason for not providing information. Radiographers also supposed that information was not needed or that it might cause unnecessary fear. It is crucial to be aware of the possible barriers in order to set up proper information. To our knowledge, this is the first comprehensive study to reveal specific reasons for the passive approach, limiting the comparison of the results with other studies.

Table 2
Numbers of different comments given to the open-ended question (“other reason”) regarding the reasons for not providing information.

Comments	Radiation	
	Dose (n = 25)	Risks (n = 12)
did not inform unless patients asked	4	3
there is no time	4	1
justification has been considered	5	3
it is the duty of referrer	–	1
patient is more interested in the examination being done	1	–
doses are low or difficult to estimate	3	–
patients don't understand	3	–
patients don't want to know	–	1
there are no instructions	5	2
I don't use radiation	–	1
Total	25	12

Inadequate information

According to the present survey, 59% and 53% of the radiographers did not inform about the radiation dose and the risks, respectively. We realise that some other important information, e.g., information on the examination itself,¹⁴ should also be provided but, in this study, we wanted to concentrate on the main issues related to radiation exposure – the dose and the risks.

Despite directives and recommendations, there are reports that patients are poorly informed prior to their radiological examinations.^{2,3,10,11} In a systematic review, approximately 29% of patients (range 7%–45%) reported being informed about CT radiation risks or dose.¹⁰ According to two other studies, patients reported having received information more seldom than professionals described having given it. Altogether 22% of the physicians reported that they had provided benefit/risks information about CT scans while 7% of the patients said that they had received that information.²⁰ Furthermore, 78% of the emergency providers reported routinely discussing radiation dose with patients while 20% of the patients reported that this had happened.²¹

The results regarding the University Hospital in the present study and the results of our previous study carried out among patients in the same hospital¹⁴ can be compared although there were some differences regarding the questions used. There seems to be a notable discrepancy between the results of these two studies. According to our previous survey, 51% of the patients (75/147) reported having obtained some kind of oral information. Information about the indication, for example, was mostly obtained from the referrer, and only a few patients reported having obtained any information about the dose and/or risks.¹⁴ The reasons for this discrepancy remain unclear. It is possible that the patients had forgotten some of the information obtained, or the radiographers may have overestimated their practice.

Reasons for not providing information

Regarding the passive approach to information, the radiographers in the present study assumed that patients had already been informed by the referrer. This finding may be due to lack of guidelines. There is a need for more detailed local guidance

regarding the content of information and division of responsibilities.

Another reason for not providing information was that radiation dose and risk information was perceived as unnecessary. This is inconsistent with the EU Directive and many guidelines.^{2,3,10,11} Furthermore, our previous study has identified that 95% of the patients in the University Hospital wanted for radiation dose and risk information.¹⁵ The third main reason was radiographers' assumption that radiation dose and risk information might cause unnecessary fear. However, in the previous study, only 5% of the patients did not want to get any information about the dose and the risks in connection with any examination using ionizing radiation.¹⁵ Appropriate information may even reduce anxiety. According to another study, understanding imaging radiation risks and active participation in decision-making were perceived as especially important by cancer survivors.²² The background for these two barriers, “unnecessity” and “fear”, could be lack of knowledge and elusive attitude to interactive communication. The concept of informed consent may also be unknown or is not appreciated. Consequently, education of professionals seems to be essential.

There were some interesting spontaneous comments regarding the reasons. The comments “justification has already been performed” and “no instructions” refer to the need for guidance. It was also assumed that patients are not able to understand radiation issues. It has been stated that professionals should tailor information according to individual wishes, making no assumptions about information needs or levels of understanding.²³ The comment “did not inform unless patients asked” may reveal lack of comprehension regarding responsibility for giving information.

Overall, it is known that there is still limited awareness of radiation-related issues among patients, referrers and professionals working with radiation^{10,17,24–27} even though some increase of knowledge has been reported.^{21,28} The radiographers in this survey perceived themselves to be rather well prepared. According to one study, radiographers seldom inform patients about the risks of CT unless patients specifically ask about them. They felt referrers should take a greater role in informing about the benefits and risks.²⁹ Another study assessed the reasons for radiographers' passive approach to risk communication. Radiographers did not want to discourage patients from having CT examinations. In addition, there was lack of time and lack of risk knowledge.¹³ Lack of time was not often mentioned as a reason in our study.

Development of information

Our previous studies among patients have revealed inadequate information and wishes for diverse information.^{14,15} The present study revealed some reasons for insufficient information. Taken together, this has prompted the introduction of better patient information, such as easy-access information on the internet and guidance on the data in appointment letters, waiting rooms, posters and flyers.

In general, there has been a lack of consensus as to who should inform patients, in what specific situations, and what information should be communicated.¹⁰ It is also realised that information practices may differ between different countries. In practice, information about the risk may be more meaningful to the patient than dose information when making an informed decision. However, information about the dose may help to understand risk information, and dose information has also been highlighted in the literature.^{2,8,9}

Information notices may be helpful in connection with lower dose examinations, whereas discussion is recommended with higher dose examinations. However, digital material, whenever possible, could be utilized, and it might replace at least part of the

discussions. With the increasing digitization of healthcare, internet and electronic methods have proved to be an excellent source of patient information.^{30–32} Regarding discussions, the referrer could be the first one to provide information in connection with the justification process. However, some patients visit their doctor in primary care but do not necessarily meet the referring doctor in the hospital prior to the examination. This emphasizes the role of practitioners to provide information. In practice, radiographers could have a greater role, particularly in dose and risk information. A note regarding the provided information (or lack of it) in patient records would help the radiographer to act in an appropriate way: giving information, checking understanding, or inquiring possible questions.

In relation to conveying dose and risk information, we have previously published patients' expectations and different forms to indicate these issues. Dose may be demonstrated, e.g., by using symbols, background radiation or verbal scales, whereas risks may be indicated by using verbal or numerical scales.^{15,33} In addition, patients must always have the opportunity to ask questions.

To help both patients and professionals with this challenging issue, digital educational information for patients and separately for professionals – referrers, radiologists and radiographers – has been drawn up. For a start, educational material along with video clips drawn up for the public with information about radiation and different examinations has been displayed on the internet (The Virtual Hospital 2.0) to be available for anyone.³⁴ Easy-access material for professionals will soon be published on the internet as well. Local compact guidelines defining the content and responsibilities for providing information are also being prepared. Education of referrers, radiologist and radiographers in relation to ionizing radiation, but also on related legislation seems to be essential. It is also important to inform them about the wishes and attitudes of patients. Resources and attitudinal changes are also needed.^{14,15} Furthermore, it will be important to measure the outcome of these interventions in the future.

Limitations of the study

There are some limitations in this study. The study is from one University Hospital district only. However, the survey covered public radiology departments in Northern Finland as a whole, and similar findings might occur elsewhere as well. In addition, the survey was performed several years ago. However, this study is a part of a larger research and developmental project regarding patient information. A guide to justification for referrers including some guidelines on patient information has been published in Finland in 2015. It is not known whether there has been any change in the practice over the last years.

Conclusions

In conclusion, radiographers in Northern Finland do not systematically discuss the radiation dose and the risks of the examinations with patients. The main reasons for not providing information are ignorance regarding responsibilities, assumption that information is not needed, and concern about causing unnecessary fear. Better interactive communication between the radiographer and the patient seems to be needed. Education and practical guidelines specifying the responsibilities and the content for the information are crucial. Digital educational material with video clips for public has already been displayed on the internet.

Declaration of Competing Interest

None.

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