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Radiography – How do students understand the concept of radiography?

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ABSTRACT

Background: Radiography as a concept has mainly been associated with the functional role of the radiographer. The concept has been studied from a theoretical point of view. However, there is a lack of a theoretical foundation and research on the actual substance of the term radiography used in education. It is therefore important to undertake an investigation in order to determine how students after three years education understand the subject of radiography.
Aim: The aim of this study was to analyse how students in the Swedish radiographers' degree program understand the concept of radiography.
Method: A concept analysis was made according to the hybrid model, which combines theoretical, fieldwork and analytical phases. A summative content analysis was used to identify the number and content of statements. The empirical data were collected from questionnaires answered by radiography students at four universities in Sweden.
Findings: All radiography students' exemplified radiography with statements related to the practical level although some of them also identified radiography at an abstract level, as a subject within a discipline. The attribute 'An interdisciplinary area of knowledge' emerged, which is an attribute on the abstract level. The practical level was described by four attributes: Mastering Medical Imaging', 'To accomplish images for diagnosis and interventions', 'Creating a caring environment' and 'Enabling fruitful encounters'.
Conclusion: The hybrid model used was a versatile model of concept development. The results of this study have increased the understanding of what characterizes the concept of radiography in a Swedish context.

Radiography as a concept has mainly been associated in the past two decades with the functional role of the radiographer, the radiographer's profession and how efficiency in the performance of the role can be enhanced,[1,2] the education of radiographers and the science of radiography.[3] This means that the content of the concept may vary according to these perspectives. Even if the general use of the concept has been studied from a theoretical point of view and defined in a linguistic form, Ahonen[3] emphasizes that the concept still lacks a firm theoretical foundation.

In Sweden as well as in the rest of Europe, radiography has been accepted as a subject in most radiographers' degree education. However in some programmes in Sweden radiography is integrated in for example in the subject of medicine in diagnostic radiology or health sciences. The Swedish radiography program is a 3-year separate program at university level, specialised in diagnostics and interventional radiology, and gives a certificate as a registered radiographer. The radiographers are responsible for the entire radiological examination i.e. for patient care, modalities and the medical technology involved. Although radiography has been studied from the conceptual or theoretical perspective, there is a lack of research on the substance of the term radiography used in education. It is therefore important to undertake an investigation to determine how students after three years of education understand the subject of radiography in an attempt to clarify its meaning and enable comprehension and its use in education. Concept analysis is useful in clarifying vague concepts so that everyone who uses the terminology will subsequently speak about the same thing.[4] The

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aim of this study was to analyse how students in the Swedish radiographer's degree education understand the concept of radiography.

Method

The concept analysis of radiography was undertaken according to the hybrid model, created by Schwartz-Barcott and Kim,[5] which combines theoretical and empirical analysis and consists of three interrelated phases: an initial theoretical phase, a fieldwork phase and a final analytical phase. The initial phase requires a comparison of theoretical definitions used in the field, thus developing a tentative working definition. A fieldwork phase was then carried out to empirically elucidate the substance of radiography from the students' perspective. The final analytical phase was carried out to achieve an understanding of the content and substance of radiography in the educational context and that the study might help to understand the foundations of radiography.

Theoretical phase

In the theoretical phase, a thorough review of the literature was done to identify definition from the perspective of the profession, research and education and other areas of radiography.

The radiography literature is multifaceted and diverse. According to Nixon[6] much of its knowledge base consists of research of nurses, medical practitioners and physicists, rather than radiographers themselves. The radiographer profession in Sweden is young (recognized in approx. 1960) and the numbers of professionals as well as the level of scientific activity in the educational institutions are limited. It is important to clarify the content and use of radiography, especially since Ahonen[3] emphasized the necessity of examining the concept continuously. Moreover, from a literature review, Adams and Smith[7] claim that it is fundamentally important for radiography to be further developed both as a concept and a research culture.

In relation to health sciences, the concept of radiography has been defined as an umbrella term for the two professions of diagnostic and therapeutic radiography.[8] Radiography has, as a profession, formerly focused on the functional part[2] and only lately has the role been extended owing to demands from the diagnostic imaging service, into areas previously dealt with by radiologists.[9–11] Radiographers' professional competence related to good nursing care has been studied using the critical incident technique where eight different skills were identified in two competence areas: directly patient-related and indirectly patient-related areas.[12] This indicates variation and complexity in the profession of radiographers.[12,13] Consequently, the multiplicity of the clinical professional work requires that there are competencies focused on both nurse-initiated care and radiographic and technical processes.[14]

Radiographers' clinical professional work comprises three parts of the periradiographic process, i.e. pre-, intra- and post-procedural care,[15] which are contingent on proficiency in the nursing process and reflection skills. This process is also signified by three phases, planning, producing images and evaluation, which are all parts of the radiographers' clinical work.[16] This denotes that the radiographer by profession is situated in a field of great tension between the requirements in encountering the patient and performing a radiographic examination or intervention, a great challenge for radiographers.[12,17] In line with Ahonen[3] the significance of diagnostic radiographers' expertise is the use of radiation, and she determined that the concept of radiography is dynamic, social, situation-related and typically based on versatile synthesis. Where the social nature of radiography is evident in collaboration and interaction with the patient, the responsibility of fulfilling the patient's needs is obvious.[18–20] According to Larsson et al.,[21] the radiographer's work is situation-related, where different components of knowledge are used in the image production process. They describe embrained knowledge that depends on peoples' conceptual skills and cognitive abilities used in planning X-ray examination and viewing images, encoded knowledge which is public such as written rules, manuals and protocols procedures and embodied knowledge which is action-oriented and context specific. A study that used discourse analysis showed that the identity of radiographers is dual in nature. On the one hand it is based on scientific-mechanic technology and on the other hand radiographers must master human and humanistic caring work.[13] Furthermore, research has been done on radiation safety and various ways to reduce patient radiation doses without a loss of diagnostic information.[22–25]

Less attention has been paid to what radiography means as a subject,[1,2] therefore Lundgren and Furåker[26] conducted a study to gain understanding of the subject of radiography from an educational perspective. The purpose was to analyse the characteristics in curricula and syllabi documents in order to describe radiography in radiographers' degree education in Sweden. The analysis of the documents describe radiography as having an interdisciplinary base, integrating knowledge and modes of thinking from two or more disciplines. Radiography emphasis on knowledge from mainly three different paradigmatic orientations: medical, technological and nursing science. In some education programs, social and behavioural sciences, physics and medical imaging were integrated into radiography. The program was self-contained in the subject area and did not share courses with other programs. The authors stressed that, since nursing and medical science represent different paradigmatic approaches, this can cause difficulties when the aim is to strengthen the discipline of radiography and specific professional qualifications. However, the Swedish Society of Radiographers[15] has determined that radiography is multidisciplinary, draws on knowledge from different disciplines but stays within the boundaries of those fields, which includes radiographers' professional knowledge, responsibilities and research area. These factors show the dynamic nature of the concept.

Since radiography uses knowledge from other paradigms but is not part of them, radiography can, according to Cash,[27] be characterized as an applied discipline. However, radiography has been conceptualized as a practical science, starting from the foundation of radiographer's work, claiming that the objective of radiography is the medical imaging of a patient with the medical use of radiation.[28] To increase the possibilities of development of the discipline Hafslund et al.[29] suggest the implementation of evidence-based knowledge in curriculums, whereas Ahonen and Liikanen[30] recommend that radiography can be clarified by a systematic development of terminology. The theoretical phase shows that radiography is a concept used by profession in patient care, educational and research perspectives. The concept describes both a process and an outcome in these perspectives, reflecting a theoretical understanding as well as a practical meaning in a specific context.

The fieldwork phase

The aim of the fieldwork phase was to refine the concept through empirical justification in an educational context, as described by Schwartz-Barcott and Kim.[5] Refinement in this phase is an analysis of the patterns of contextual meaning of the concept using a qualitative research method.[31]