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Research Article

A Study of Student Radiographers' Learning Experiences in Imaging Obese Patients

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ABSTRACT

Introduction: As the prevalence of obesity rises, radiographers must be capable of producing high-quality radiographs despite difficulties presented such as inadequate radiation penetration, increased scatter/poor image quality, and compromised surface anatomy palpation. Greater awareness and development of strategies are required because current scientific literature and learning resources addressing radiographic imaging of obese patients may be inadequate for student radiographers. This study investigates the confidence, perceived competence, and learning experiences of student radiographers imaging obese patients.

Methods: After ethics approval, a qualitative study in a grounded theory tradition was conducted through focus groups with second- and third-year diagnostic radiography students (31 participants over six focus groups).

Results: Key concepts of experiential learning during placement, radiographic technique, and student confidence were identified as influential at the student-supervisor level. Key concepts of negativity toward obese patients by supervising radiographers and communication operated at the patient-student-radiographer level. Students stated difficulty applying theoretical teachings in a practical sense because of their limited experience in accounting for anatomic variations and increased adipose tissue, and their difficulty was linked to specific anatomic regions.

Conclusion: Students were challenged by knowledge of exposure factors and limited practical-simulated learning when imaging obese patients. Additionally, participants rated current learning resources as inadequate and preferred to be paired with a qualified radiographer for confidence and manual handling issues. Students reported negative weight bias toward obese patients by qualified/senior radiographers, and this may influence the empathy and attitudes of student radiographers.

RÉSUMÉ

Introduction : Alors que le taux d'obésité est en croissance, les radiographes doivent être en mesure de produite des images de grande qualité malgré les difficultés associées à l'imagerie des personnes obèses, comme la pénétration insuffisante du rayonnement, l'augmentation de la diffusion/mauvaise qualité de l'image et la compromission de la palpation des structures anatomiques. Une plus grande sensibilisation et le développement de nouvelles stratégies sont nécessaires, puisque la documentation scientifiques et les ressources d'apprentissage actuelles sur l'imagerie des patients obèses pourraient être insuffisantes pour les étudiants en radiographie. Cette étude examine le niveau de confiance, la compétence perçue et l'expérience d'apprentissage des étudiants en radiographie produisant des images de patients obèses.

Méthodologie : Avec l'approbation du comité d'éthique, une étude qualitative dans la tradition de la théorie ancrée dans des données empiriques a été menée au moyen de groupes de discussion avec des étudiants en deuxième et troisième année de formation en radiographie diagnostique (31 participants dans six groupes de discussion).

Résultats : Les notions clés d'apprentissage par l'expérience durant les stages, de technique radiographique et de confiance de l'étudiant ont été relevées comme des influences au niveau étudiant-superviseur. Les notions clés de négativité envers les patients obèses par les radiographes superviseurs et de communication agissent au niveau patient-étudiant- radiographe. Les étudiants ont indiqué avoir de la difficulté à appliquer les enseignements théoriques dans un sens pratique en raison de leur expérience limitée de la prise en compte des variations anatomiques et de l'augmentation du tissu adipeux, ces difficultés étant associées à des régions anatomiques spécifiques.

Conclusion : Les étudiants ont fait face à des défis touchant les facteurs d'exposition et l'apprentissage pratique-simulé limité de l'imagerie des patients obèses. De plus, les participants ont indiqué

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que les ressources d'apprentissage actuelles étaient inadéquates et dit préférer être appariés avec un radiographe expérimenté, pour des raisons de confiance et de manipulation manuelle. Les étudiants ont rapporté un biais négatif envers les patients obèses par les radiographes qualifiés/expérimentés et ceci pourrait influencer le degré d'empathie et l'attitude des étudiants en radiographie.

Keywords: learning; obesity; radiography; radiographic exposure; student education

Introduction

Background Literature and Statistics

Obesity is an increasing health issue in the Western world. It is a serious issue often complicated by secondary conditions such as type 2 diabetes, coronary artery disease, hypertension, stroke, liver disease, venous insufficiency, degenerative joint disease, and sleep apnea [1–3]. Obesity is defined as a chronic condition characterized by excessive body fat disproportionate to one's height and quantified with a body mass index (BMI) greater than 30. The BMI provides a classification of weight calculated through a ratio of weight (kg) over height (cm) squared (kg/cm^2) [1–5]. Despite limitations accounting for muscle mass, BMI is widely accepted as a good descriptor of obesity [5, 6]. Between 1991 and 2001, the United States saw a 74% increase in obesity, with 65% of the American population being classified as either overweight or obese [7]. These trends are reflected in Australia with Australian Bureau of Statistics (ABS) data from 2011–2012 classifying 62.8% of Australian adults as either overweight or obese [8–10].

An increased prevalence of obesity has been found to impact the workload of medical imaging departments and practices in which frontline patient diagnosis is performed [1, 7, 11]. In radiology and nuclear medicine, there have been a higher number of diagnostic reports noting that image quality has been affected by obesity [12, 13]. Uppot et al's longitudinal study over 15 years [12] found radiologic reports including the phrase "limited due to body habitus" were most common in ultrasound and general radiographic examinations. Despite technical advancements in medical imaging equipment and display, difficulties imaging obese patients still occur. These include situations in which patients have exceeded weight limits of imaging equipment, extended computed tomography/magnetic resonance imaging scan times for body coverage, motion artifacts, insufficient anatomy coverage on image receptor plates, difficulty palpating anatomic landmarks, limited patient range of movement, and inadequate radiation penetration and exposure [1, 7, 14, 15]. A review of popular radiographic textbooks shows the use of relatively thin models in photographic instructions, which could be considered at odds with the presentation of patients and, indeed, the increasing proportion of obese patients presenting to imaging departments [16–18]. Similarly, there are no known providers of computer simulation for radiography of obese patients or dedicated manikins/phantoms that easily simulate obesity for radiographic exposure role play by students.

In addition to technical difficulties, there are considerations of underlying social and psychological dimensions. Studies have shown negative weight bias and attitudes (implicit and explicit) in health care professionals can have a marked impact on patient satisfaction, especially in self-conscious patients [13,19–22]. Patients who feel embarrassed because of their obesity may choose to delay or avoid subsequent examinations, potentially affecting their health [23, 24]. Hence, it is essential that student radiographers can provide adequate care for all patients, irrespective of presentation.

The purpose of this study was to assess the learning experiences that may affect the confidence and perceived preparedness of student radiographers imaging obese patients. It is currently unknown how students evaluate their capabilities and the nature of experiential learning that may occur during clinical placement. By exploring the perceptions and experiences of radiography students, this study may identify areas of improvement in their learning curricula, with the end goal of providing better care for obese patients.

Methods

Participants

Ethics was approved by the University of Sydney Human Ethics Research Committee (#2014/321, July 2014), and written consent was obtained from all participants. Participants in the study were second-year diagnostic radiography students who had completed 13 weeks of clinical experience and third (final)-year diagnostic radiography students with 25 weeks of clinical experience (the midpoint and end point of their mandatory clinical experiences, respectively). The inclusion criterion was current enrolment in an undergraduate degree in diagnostic radiography at the University of Sydney in either the second or third year of study in 2014. There were no exclusion criteria. All students had undertaken core theoretical learning in appendicular and axial general radiography and practical sessions involving cases considering the imaging needs for obese patients.

A recruitment e-mail was distributed to eligible students who were invited to reply to the chief investigator to register their interest. Participation was completely voluntary, and group sizes varied depending on student availability. Table 1 shows the distribution and time line of focus groups conducted in a research meeting room on campus at the university.