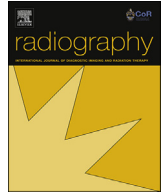




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## Diagnostic radiographers working in the operating theatre: An action research project

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## ABSTRACT

**Introduction:** Failures in interprofessional communication are well-documented and are an established cause of medical error and negative health outcomes. Socio-historical issues like imbalances in power and status are particularly prevalent in the operating theatre environment, adding complications to interprofessional working. Simulation, used in healthcare education, may impact positively on inter-professional working.

**Methods:** The aim of this action research study was to develop, pilot and run a simulation experience for Diagnostic Radiography (DRAD) students. Action research was used to structure this study.

The first phase of the action research was to look at the problem; this was undertaken using critical incident technique. Findings from the critical incident technique influenced the simulation event. A focus group was held immediately after the event for reflection. A second simulation using a cohort of 48 students and a reflection after a period of three months formed the second round of the project.

The simulation took place in a hi-fidelity simulated operating theatre. Thematic content analysis was undertaken of the focus group, data from the critical incident technique, and the reflections.

**Results:** The findings are discussed under the themes; identification, clarity, preparation, and the expert. Identification and lack of clarity in communication were seen as an important issue in the operating theatre. Lack of preparation of the working environment was also highlighted. Lack of confidence in the operating theatre inhibits interprofessional working.

**Conclusion:** Simulation can help prepare students for working in the operating theatre. Realism is important as is scheduling the event to ensure maximum benefit.

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### Introduction

Failures in interprofessional communication are well-documented and sadly keep recurring.<sup>1–3</sup> These are highlighted in the powerful film about a loss of life during a straight forward operation.<sup>4</sup> Poor communication is an established cause of medical error and negative health outcomes.<sup>5</sup> It can reduce the quality of care and patient safety.<sup>3</sup> An area that is recognised as needing education and training in interprofessional communication is the operating theatre environment.<sup>6</sup> This is a complex working environment where miscommunication can result in conflict, jeopardise the patient safety and care, and where having team members silenced though hierarchical structures can be detrimental.<sup>6,7</sup> Since the Institute of Medicine's report,<sup>8</sup> organisations have been looking

at how to improve their local culture.<sup>9</sup> Different strategies are being employed aimed at improving the culture within the operating department such as the WHO surgical safety checklist,<sup>10</sup> and training programs that have an element of simulation such as Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS).<sup>11</sup>

Socio-historical issues like imbalances in power and status are particularly prevalent in the operating theatre environment, and add complications to interprofessional working.<sup>12</sup> Simulation provides a platform on which to highlight and address these issues. In the past, education in human factors and nontechnical skills including, teamwork and communication has been limited and undervalued.<sup>13</sup> It was recognised over 10 years ago that an inter-professional approach in an operating theatre offers greater benefits to patient care and safety, than the silo mentality.<sup>14</sup> Although only on a small scale, hi-fidelity simulation within the operating theatre has been used with nurses, anaesthetist and medical students to improve attitudes and behaviours towards teamwork. In

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the evaluation of the single session it was found to be feasible, effective and well received.<sup>15</sup> A study by Hinde et al.<sup>16</sup> showed that simulation is also a useful intervention for improving safety in operating theatres. The participants in their study were members of the theatre team, however, they did not include diagnostic radiographers who are transient, rather than permanent members of the operating department team. Pena et al.<sup>7</sup> rightly identifies that improving only surgeons' non-technical skills without training other professionals involved in this complex environment may not lead to the desired improvements. Integrating diagnostic radiographers into the team is important as it has been shown that different terminology is used by surgeons and radiographers.<sup>17</sup> A study to assess the communication between orthopaedic surgeons and radiographers concluded that clear and unambiguous communication reduces the radiation dose to the patient, thus improving their safety.<sup>18</sup>

It has been identified that newly qualified diagnostic radiographers find working in the operating theatre challenging.<sup>19</sup> Thus, the aim of this action research study was to develop a simulation experience for diagnostic radiography (DRAD) students to help prepare them for practice.

## Methodology

A collaborative approach was taken for this study which is advantageous when developing resource intensive educational interventions.<sup>20</sup> Institutional ethical approval was obtained for this project. Participants were provided with an information sheet and gave informed consent. Individuals have not been identified in the writing up of this project in order to preserve anonymity. Action research was used to structure this study which is a suitable strategy for practice development research by health care professions.<sup>21</sup> It has different forms, with the common principles of being a systematic process that provides a rigorous cyclical practice based methodology for change.<sup>21</sup> The basic action research model has the stages of plan, act, observe and reflect.<sup>22</sup> The value of this methodology is in its reflective nature both for the researcher and the participants.<sup>22</sup> The first phase of the action research was to look at the problem; this was undertaken using critical incident technique. Findings from this influenced the nature of the first simulation event which formed the act part of the cycle. A focus group was then held to reflect on the event. A second round of the action research commenced with a second simulation for a cohort of second year Diagnostic Radiography students. Following a period of three months the students who had subsequently been in the operating theatre on their clinical placement voluntarily reflected on their experience. See Fig. 1 for a diagram of the process.

## Participants

A cohort of second year ODP and third DRAD students from one university were approached at the start of a lecture to take part in the initial exploratory part of this study. This was a purposive convenience sample as they were at a point in their courses where they had sufficient experience to be able to put forward their perspective on working in the operating theatre where imaging was required. Twenty-three DRAD students and six ODP students contributed to the critical incident technique. Not all ODP students had worked in a theatre where imaging was required which accounts for the lower contribution rate. First year ODP students and second year DRAD students were invited to take part in the simulation because they could potentially gain most from the experience. The timing of simulation is important so that students have sufficient prior knowledge and experience to be able to fully engage.<sup>23</sup> Four female DRAD students took part in the first simulation with an

interprofessional team of facilitators including a nurse, ODP and diagnostic radiographer. No ODP students were available.

The second simulation in the operating theatre was undertaken as part of the normal delivery of the BSc (Hons) Diagnostic Radiography course. One cohort of second year DRAD students participated with an ODP student, ODP lecturer, and a DRAD lecturer facilitating.

## Critical incident technique

Critical incident technique is a qualitative research methodology developed by Flanagan, during World War II.<sup>24</sup> The methodology is used to collect and analyse reports of behaviours in particular situations.<sup>25</sup> It is gaining increasing popularity in healthcare for gathering the perspectives of both professionals and service users. In this part of the study paper-based data was collected. The participants were encouraged to provide a description of a situation, actions or behaviours during the situation and the outcome of the behaviour in the operating theatre.<sup>25</sup> The popular approach of eliciting one positive incident and one negative incident from each participant was adopted.<sup>26</sup> This data was used to develop scenarios for the simulation.

## First simulation

The simulation took place in a hi-fidelity simulated operating theatre. To enhance the realism a practising operating department practitioner and diagnostic radiographer played the role of surgeon and anaesthetist in the scenario. Although changing professional roles for the participants can be challenging,<sup>27</sup> this was not thought to be problematic for facilitators. Pre-briefing took place in the operating theatre prior to the simulation. This enabled the students to be instructed in the scenario objectives, allocate roles, have an orientation to the environment and set ground rules, all of which are essential for enriching the simulation experience for the learners.<sup>28</sup> Realism was further enhanced by the participants wearing scrubs and other relevant personal protective equipment such as masks and lead aprons. Two scenarios were run consecutively with two students taking turns to play the role of the radiographer and the others observing. In the first scenario, the radiographers were in the theatre at the start of the procedure and included in the WHO checklist.<sup>10</sup> In the second scenario, they were called at the last minute, the surgeon was impatient and equipment needed moving. Following the simulation, a debriefing session took place away from the simulation environment in room setup appropriately for a group discussion.<sup>29</sup> Focussing on the communication and teamwork skills an advocacy-inquiry framework for debriefing was undertaken by a trained facilitator.<sup>30</sup>

## Focus group

A focus group was undertaken following the simulation debrief to evaluate the exercise. Focus groups are commonly used in action research and use the interaction between participants to discover how they think or feel about a situation.<sup>31</sup> They are useful for exploratory work, producing a considerable amount of information in a short space of time.<sup>27</sup> Four students and three academic staff participated in the focus group which meets the suggested number of 6–12 people for a focus group.<sup>31,33</sup> It is thought that any less than this might result in a lack of stimulus for discussion, or dominance by one participant.<sup>28</sup> Focus groups consist of individuals with common characteristics.<sup>34</sup> In this case, homogeneity was achieved by the participants all having experienced the same simulation, the mix of academic and student was facilitated and did not appear to inhibit the conversation. Due to the richness of the discussion

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