

Student radiographers' perceptions of evidence-based practice during clinical placements: implications for health professional education

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Abstract

Educating students to become evidence-based practitioners remains a significant challenge in health professional education. Clinical placements form a significant element of curriculum and the impact of students' placement experiences on their ability and desire to practice in an evidence-based manner remains largely unexplored. Medical imaging students complete a variety of clinical placements and observe and participate in a range of clinical settings. This study utilised focus groups to explore students' experiences of evidence-based practice (EBP) during clinical placements, the impact of these experiences on their education and their future tendencies within the profession. Reflexive thematic analysis was utilised to analyse data and three main overarching themes were identified. The first theme, "Education" explored participants' understanding of the concept of EBP, the importance of sound pedagogy to enable students' ability to practice in an evidence-based manner and explored the relationship between participants' placement experiences and their future EBP tendencies. The second theme investigated, "Culture and responsibility" and was divided into three subthemes, professional, organisational, and individual. Focusing on where the responsibility for implementing EBP should lie and the impact of culture on individuals' ability to implement evidence-based practice. The third theme, "Hopes, fears, and barriers" explored the participants' sense of responsibility around implementing EBP and the barriers that they had experienced in doing so. It illuminated their fears around becoming apathetic as clinicians. Improving the teaching of EBP skills within health professional education has the potential to enhance the translation of knowledge into practice as graduates become clinicians within the profession.

Introduction

Problem formulation and study aims

Students' experiences of clinical placements form a significant element of their education. The nature of clinical education means that a significant portion of this learning experience is out of the direct influence of the academic. Within academic circles in medical imaging, evidence-based practice (EBP) has been widely accepted as the optimal approach for quite some time (Gambling et al. 2003; Hafslund et al. 2008a; Smith 2009). Studies note that the translation of EBP within the clinical realm has historically been slow (Ahonen and Liikanen 2010; Upton and Upton 2006) however in recent years there has been a push towards approaches to better translate evidence into practice within the profession (Brettle 2020; Di Michele et al. 2020).

Education in the field of medical imaging has undergone a transition in the last 30 years. The predominant model has shifted from a department-based internship to a University degree level qualification and it has been suggested that there is a correlation between the newer generation of radiographers exhibiting more evidence based tendencies than previous generations (Abrantes et al. 2020). It remains apparent that there is still a substantial knowledge to practice gap within the profession

that needs to be addressed (Ahonen and Liikanen 2010; Hafslund et al. 2008a). A reasoned pedagogical approach to improving the teaching of EBP in medical imaging curricula must therefore be considered.

Evidence-informed health professions education has been gaining momentum in recent years (Maggio et al. 2018; Thomas and Bussières 2021; Tractenberg and Gordon 2017). Approaching health professional education (HPE) from an evidence-based perspective helps to ensure effective and efficient teaching practices. There has been considerable research into best practice for teaching EBP to students however there remains a lack of focus on EBP within radiography education (England and McNulty 2020). There is strong evidence to suggest that clinically integrated teaching is an effective approach to enhancing the competencies required for EBP among students (Hallé et al. 2021; Thomas et al. 2010; Young et al. 2014). Little research exists that explores how students' experiences during clinical placements affects their perspective of EBP.

Medical imaging students complete a variety of clinical placements and observe and participate in a range of clinical settings. As such, the purpose of this study is to explore students' experiences of EBP during clinical placements, the impact of these experiences on their education and their perspective of EBP tendencies in the profession.

Methods

Qualitative approach and research paradigm

This study was approached from a social constructivist lens whereby knowledge is viewed as being shaped by context and collaboration rather than being fixed (Jones et al. 2014). This lens is consistent with EBP as, "the meaning of research evidence and how it fits with a particular client is, therefore, constructed and interpreted by the clinician who acts as an active problem-solver and constructor of personal knowledge" (Thomas et al. 2011, p.225). What constitutes knowledge is an important consideration in this research; opponents of EBP have long articulated a shortfall in relation to the acceptance and legitimacy of qualitative research. Historically quantitative approaches have been favoured within EBP research and this was indeed echoed within the findings of the focus group itself with participants noting that clinicians are more likely to implement evidence-based changes to their practice in relation to radiation safety as opposed to communication. However, qualitative approaches enable deeper understanding of complex issues and varied perspectives and are therefore appropriate to address the aims of this study.

Context

The study site was a university that offers an accredited diagnostic radiography program at both undergraduate (UG) and graduate entry masters (GEM) levels in Australia. To achieve registration upon graduation to the Medical Radiation Board of Australia, students must demonstrate a depth and breadth of clinical experiences within their clinical program. This means having a range of placement experiences

that include rural, metropolitan, private sector and public hospital placements. This places students in the position of observing and participating in clinical practice in a variety of settings.

Sampling strategy

To be eligible to take part in the study, participants were required to be currently enrolled students in a diagnostic radiography program at the University and must have undertaken a minimum of two clinical placement experiences. Recruitment was initiated by an external academic who had no ties to the research team in order to reduce any perceived coercion. Interested participants were directed to email a member of the research team (LDM) to receive additional information.

Ethical issues pertaining to human subjects

Ethics approval was sought and obtained from the Human Research Ethics Committee at the University of Sydney (2016/769).

Data collection methods

Data were collected through a short demographic survey and focus group interviews. The demographic survey allowed the researchers to identify the level of placement experience that the participant had already undertaken and on this basis, participants were allocated to one of two focus group studies that grouped students with similar levels of placement experience. A semi-structured, open ended focus group interview template was developed to guide the focus group discussion. Examples of questions can be found in Table 1.

Data collection instruments, technologies, and processing

The research team developed a semi-structured question guide that explored students' understanding of evidence-based practice and their experiences during clinical placements; this guide was peer reviewed by academic colleagues outside of the research team. A member of the research team (LDM) facilitated both focus groups which were audio-recorded and transcribed verbatim by a third party not connected with the research team. The qualitative analysis software NVivo was used to code the transcribed data.

Participant characteristics

Two focus groups were conducted; the first of these groups contained nine participants in their third year of a four-year undergraduate program. These participants had each completed three clinical placements of six weeks full time, totalling eighteen weeks of clinical experience per student. The second focus group

contained eleven participants in their final year of a two-year GEM program. These students had each completed four clinical placements; one of these placements was a seven-week part time placement and three were six-week full time. The students in this focus group totalled twenty-two weeks full time equivalent of clinical experience per student. Demographic data was collected on students' highest level of educational attainment, these results are presented in Table 2.

Data analysis

Data were analysed using reflexive thematic analysis (Braun and Clarke 2022). Theoretical flexibility is a hallmark of reflexive thematic analysis and has been utilised within this study in a way that aligns with the social constructivist lens through which the study was approached. A deductive approach was undertaken whereby the latent meanings of data were explored as this was deemed most appropriate to deeply explore the underlying meaning of the experiences of participants and the impact of these experiences on their education.

The first author (LDM) undertook the process of data familiarisation by both listening to audio-recordings and reading through transcripts of the focus groups (Braun and Clarke 2022). Utilising NVivo, initial codes were systematically generated from data segments and codes were then grouped into themes. Theme development was an iterative process whereby initial themes were generated; the codes, data segments and full transcripts were then revisited to further refine the published themes. Theme generation was deductive and latent whereby the researchers undertook to explore the meanings within the data and how they fit within what is already known in relation to the topic at hand. Data were analysed critically to construct and realise the meanings expressed by participants within the broader context of the knowledge that exists.

Techniques to enhance trustworthiness

During the research process, the first author (LDM) kept a reflexive journal to monitor the reflexivity and assumptions being brought to the analysis of materials and to ensure credibility (Braun and Clarke 2022; Connelly 2016). To further enhance the credibility, dependability and authenticity of analysis, peer debriefing was undertaken with other members of the research team through team meetings and discussions (Connelly 2016).

Results/findings

Synthesis and interpretation and Links to empirical data

A total of twenty participants were recruited from both UG and GEM programs and all recruited participants had undertaken a minimum three clinical placement experiences. Table 2 summarises the demographic data for each focus group. The groups were relatively homogenous demographically with

some minor differentiation in relation to the highest level of qualification attained however each student had a different placement mapping and therefore their clinical placement experiences throughout the course of the degree may have differed significantly. There were a range of genders and cultures represented within the study.

Three overarching themes were developed during data analysis: “Education”, “Culture and Responsibility” and “Hopes, Fears, and Barriers”.

Education

This theme looked at education as the starting point of all practitioners’ journey with EBP. It explored students’ fundamental understanding of EBP as a concept. It discussed the importance of pedagogy in building EBP skills, comparing the training versus education model. It delved into concepts of lifelong learning, critical thinking and looked strongly at challenging previously held knowledge and existing assumptions. Further to this, it examined the perceived shortfalls of the education that these students have received. Table 3 provides a summary of quotes representing this theme.

Participants within both focus groups had a consistently narrow definition of EBP that does not align with the more generally accepted definitions. They defined EBP as simply applying research-backed evidence in the clinical setting and most strongly equated their own learnings from university with EBP. Participants widely agreed that there was a strong tendency for clinicians within medical imaging to place higher value on the clinical expertise of practitioners than that of research-based evidence and articulated that they perceived this value to be misplaced. Those participants that did discuss clinical expertise as an asset were quickly shut down by their peers within the focus group. No participants articulated a link between clinical expertise and EBP, preferring to explore them as separate concepts.

Many participants perceived that the pedagogical approaches adopted in their academic subjects did not set them up well for implementing EBP in practice nor did they feel it encouraged them towards becoming evidence-based practitioners upon graduation. The perceived didactic teaching approach was viewed negatively by participants and there was a feeling of their potential being limited by this style of teaching. Participants identified the development of critical thinking, learning to assess the quality of research and adapting this research to the clinical environment as fundamentally important to their education however felt that this wasn’t well developed in their academic or clinical education. They described a disconnect between the way in which learning occurred during their academic subjects and the development of the skills required to practice in an evidence-based manner.

There was a wide sense of disempowerment that was apparent and consistent across both focus groups when it came to their ability to implement EBP on clinical placement. Participants reported a strong link between the attitudes of their clinical educators and their ability to implement EBP during placement experiences. Participants felt that their ability to implement EBP on placement had a substantial impact on their ability to learn and develop their skills.

Culture and Responsibility

This theme explored participants' perceptions of where responsibility lies for implementing EBP in the clinical setting and reflected on the existing cultures. In order to categorise this further and provide additional structure for analysis this theme was broken down into three sub-themes "Individual" "Organisational" and "Professional". Table 4 provides a summary of quotes representing this theme.

Professional

Within this sub-theme participants discussed the role that the profession more broadly has on the implementation of EBP. There was a strong sense of hierarchy when it came to the implementation of EBP in the experiences that participants had encountered. Research backed up by a strongly "scientific" or quantitative foundation was viewed as more important, particularly in relation to radiation dose reduction and paediatric patients. In contrast traditionally qualitative fields were viewed as less important with participants discussing elements such as communication as being a skill that can't be improved with further research.

Professional stagnancy received significant attention and participants kept returning to this throughout the discussion. The concept of practitioners continuing to practice in the way in which they were taught was strong and participants noted the ways in which this limits both individual professional development and the advancement of the profession.

Organisational

The barriers to EBP discussed by participants at an organisational level are quite consistent with the barriers reported in other literature. Participants explored both their positive and negative encounters during clinical placement experiences and noted factors that they believed to influence the evidence-based tendencies within departments and wider organisations. There is a very strong sense that for an organisation to have a culture that prioritises EBP, senior management must be proactive and evidence-based themselves and create structural efforts to support the culture within the department. Participants perceived those organisations that are strong in terms of implementing EBP had a significant advantage over competitors that did not, linking this to cost and efficiency savings.

Participants also described the impact that social forces can have on an individuals' ability to implement EBP. This was again noted in both positive and negative scenarios where participants discussed examples of feeling pressured to implement practice that was not evidence based to conform to the standards of the organisation and alternatively where they were encouraged to explore and implement EBP on their placements.

Individual

There was much debate and little consensus in terms of the ability of the individual to implement EBP in the scenario where an organisation does not prioritise this action. Participants noted a differentiation in the ability of students versus practitioners to implement EBP. Some participants perceived that once the supervision requirements of being a student were lifted and they had the ability to practice independently that they would have more agency to make their own decisions in relation to implementing EBP; other students felt that they were still limited by the organisational priorities in this respect and that barriers such as time and resources made implementing EBP a continual challenge for individual practitioners.

Participants noted that individuals who are evidence-based in their practice have a competitive advantage when compared with their peers who are not. They felt that individuals who are more evidence-based in their practice were more sought-after employees, were likely to find desirable employment more readily and be able to advance more quickly and work in the areas that they want.

Hopes, Fears, and Barriers

This theme explored the participants' hopes and fears: they see themselves as the future of the profession and hope to lead it in a more positive direction however they fear becoming a part of "a cycle of defensiveness about knowledge" (FG2) that they see within the profession. Participants agreed that EBP is fundamentally important to both themselves as professionals and their patients and described a sense of responsibility around implementation and a frustration at the barriers that prevent them from doing so. There was agreement about the early years in the profession being crucial for their development as evidence-based practitioners and they discussed their fears around these formative years, describing a sense of worry around the type of organisation they gain employment at.

Participants passionately articulated their desire to influence change in the profession. They discussed this particularly in relation to professional stagnancy and their view that the culture within the profession needs to change. There was a strong sense of urgency that surrounded this discussion and a sense of impatience from the participants who wanted to see immediate change.

Participants discussed several barriers to their ability to implement EBP on placement which were consistent with the barriers reported in the literature that are faced by professionals within the field of medical imaging. They reported feelings of medical dominance when practicing clinically, time and resource pressure and strong social forces that limited their ability to implement EBP.

Discussion

“Education is the Genesis”

Participants in this study clearly perceived their academic education as foundational to their ability to implement EBP in practice both as students on clinical placements and into their future careers. The importance of developing the skills required to practice in an evidence-based manner during HPE has

been extensively explored in the literature to date (Melnik et al. 2008; Thomas et al. 2011) however there remains no consensus as to the most effective pedagogical approach to teaching EBP (Hallé et al. 2021; Hitch and Nicola-Richmond 2017; Thomas et al. 2011). Thomas and colleagues (2011) suggest that EBP needs to be consistently integrated across HPE to be effective and that approaches where WIL placements are well integrated into curricula tend to be more effective. A systematic review of educational interventions for implementing EBP found that there was a lack of high-quality validated instruments to measure EBP education interventions and that interventions reported had a strong tendency to focus on a single step of EBP education, most commonly critical appraisal (Albarqouni et al. 2018).

There is substantial evidence to suggest that creating a culture of EBP starts with faculty (Amit-Aharon et al. 2020; Fineout-Overholt et al. 2010; Kalb et al. 2015; Melnik et al. 2008; Milner et al. 2018). Measuring and quantifying the translation of skills in terms of impact on patient outcomes is impossible (Albarqouni et al. 2018) and according to Thomas et al. (2021 p.263), “teaching interventions have a greater impact on knowledge and skills than they do on sustainable EBP behaviours”. Despite this, there is a demonstrated positive association between the skills required for EBP and individuals’ perceptions of EBP and likelihood to implement EBP in the future. It could be argued that setting students up well with the skills required to address each of the five elements of EBP, including asking a question, searching for evidence, critically appraising the evidence, implementing the evidence and evaluating the implementation (Johnson 2008), would afford them the best opportunity to become evidence-based practitioners. Strongly integrating the concepts of EBP throughout curricula and providing students with the skills necessary to enact EBP are vital to producing graduates that will take EBP into their future careers.

Throughout the focus groups, participants’ definitions of EBP were consistently narrow and focused strongly on the empirical evidence as the epitome of EBP. The other pillars of EBP, clinical expertise and patient preferences (Sackett et al. 1996), were discussed less frequently, less directly, later in the discussion and to a poor reception; participants who did discuss clinical expertise as an asset were shut down by their peers who voiced strong contrary opinions and the social nature of focus group discussions meant that these views were then not explored in significant depth. This finding is consistent with that by Halle et al. (2021) that students tend to have difficulty with the complexity and uncertainty associated with EBP and tend to view the concept in quite a black and white manner.

The differences between generations of clinicians were discussed, with participants coining the term “tech generation” for the older generation of radiographers who were educated in an apprenticeship model of training. These radiographers whilst having significant time in the profession to hone their skills tend to have less positive attitudes towards EBP and self-rate the skills required for EBP as quite low when compared to other allied health professions (Upton and Upton 2006).

The impact and importance of culture for implementing EBP

Participants felt that there was a strong link between workplace culture and their ability to practice in an evidence-based manner, both as students and into their future careers. This perception is strongly supported by literature in social science and psychology that indicates that the attitudes of individuals and the social norms of a workplace strongly affect the uptake of EBP in individual workplaces (Glasman and Albarracín 2006; Kim and Hunter 2006; Kraus 1995; Wallace et al. 2005). Participants feared becoming employed in a workplace that doesn't value EBP and becoming influenced by the dogma of the department. Those participants that had had experiences during clinical placements at sites that they perceived had positive EBP cultures discussed feelings of empowerment and noted that these sites often had strategic advantage over other sites in terms of workflow efficiencies, staff retention and patient outcomes.

Participants placed the responsibility for workplace culture firmly with management within organisations. Feelings of frustration were clear as the group discussed feeling powerless to affect the changes they perceived as necessary to create a supportive environment for EBP. Participants noted the professional culture within medical imaging felt stagnant. There is a strong possibility that the education of the "tech generation" of radiographers played a substantial role in their attitudes towards EBP and that the current historically poor attitudes towards EBP (Ahonen and Liikanen 2010; Upton and Upton 2006) can be attributed to this. There has been a call from many authors that the new generation of radiographers must push through the cultural change required in the discipline (Di Michele et al. 2020; Hafslund et al. 2008b; Higgins et al. 2015) and the desire of the participants to do this was clear.

Strengths and limitations

By utilising a qualitative approach to exploring students' experiences on placement, this study has explored an important element of students' EBP education. The use of focus groups allowed the researchers to explore the social elements of this important discussion and observe and report on the group mechanics in terms of social desirability rather than seek to control this (Smithson 2000). Throughout the discussion careful moderation was required to ensure that all participants' voices were given equal opportunity as stronger voiced participants attempted to dominate areas of discussion (Litosseliti 2003). The nature of the focus group environment and the limitations in terms of time meant that exploring individual experiences on a deep level was not possible, rather the collective experience and shared experiences were explored.

Despite participants coming from a very homogenous sample in terms of their educational background, there was diversity of gender, culture, and placement experiences. The authors recognise that the participants reflected a single healthcare discipline only however feel that many of the themes discussed are applicable across a multidisciplinary context.

Conclusion

Students' experiences and perception of EBP whilst on placement were widely varied and whilst participants had a clear and strong desire to implement EBP while on clinical placement they felt limited by poor educational preparation and disempowered by workplace cultures and barriers. In order to improve students' ability to practice in an evidence-based manner approaches to education must be integrated throughout both academic and clinical curriculum and address each of the skills required for EBP. Those with the skills to practice in an evidence-based manner are more likely to do so in their subsequent careers and to have positive attitudes towards EBP thus creating cultural change within the profession. Health professional education has a significant role to play in the translation of knowledge into practice and helping to push through cultural change to help enhance attitudes towards EBP in the profession.

Declarations

Conflicts of interest

None reported

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Tables

Tables 1 to 5 are available in the Supplementary Files section

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