

# Radiographers' knowledge about concepts and approaches to evidence-based practice

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## Abstract

This research project was incorporated in a thesis entitled "The concepts and approaches to evidence-based radiography" as partial fulfilment of the MSc Radiography (Diag) undertaken at the Anglia Polytechnic University, Cambridge, United Kingdom. The research project was conducted amongst radiographers involved in clinical training of radiography students in South Africa.

The aim was to determine the research activities, knowledge and approaches to evidence-based practice (EBP) of a cluster sample of radiographers. A 55.6% response rate was achieved. It was concluded that respondents' knowledge about EBP was poor but there was evidence of evidence-based skills and communication elements of EBP

**Keywords:** evidence-based medicine, evidence-based radiology, evidence-based health care, evidence-based research, evidence-based education.

## Introduction

Roots of evidence-based practice can be traced to the emergence of evidence-based medicine during the early 1990s. Evidence-based medicine has been defined as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients, based on skills which allow the doctor to evaluate both personal experience and external evidence in a synthetic and objective manner" [1].

Evidence-based practice is a generic term used to practice evidence-based decision-making in all clinical specialities and evidence-based health care. It means that practice should be based on the most up-to-date, valid and reliable research findings [2].

A review of the literature revealed that there are numerous publications on evidence-based medicine; a number of professions allied to medicine have embarked on this 'paradigm shift' and have formulated their own definitions but limited information could be found on evidence-based radiography.

## Purpose

Radiographers are faced with the challenges of keeping up to date with the technological advances that have been introduced over the past

30 years, role changes and expansion, heightened risks, and populations that are more informed due to increasing access to printed and electronic media. It is for these reasons that the study was conducted.

## Aim

The aim of the study was to determine the research activities of a sample of radiographers involved in clinical training of radiography students in South Africa and their knowledge about EBP.

## Method

The study was restricted to four provinces in South Africa within a radius of 300 kilometers from the university. Self-completing 22-itemed questionnaire consisting of open- and closed-ended questions was administered. Data collection entailed a two-staged process.

Stage one comprised a postal survey of a sample of 410 radiographers. The second stage involved telephonic interviews to establish additional information where applicable.

## Results

Two hundred and twenty eight (228) out of the 410 questionnaires were returned representing a 55.6% response rate.

## Summary of the results

- **Question 1** (see Figure 1). Eighty five percent (85%) of the respondents were radiographers. Although they were not designated 'clinical tutors' they played a role in supervising students in the clinical practice. Seven percent were clinical tutors who were responsible for the supervision and clinical assessments of students. Eight percent of the respondents were heads of

departments and are also involved in communications pertaining to student training. This information was established via telephonic interviews.

- **Question 2** (see Figure 2).

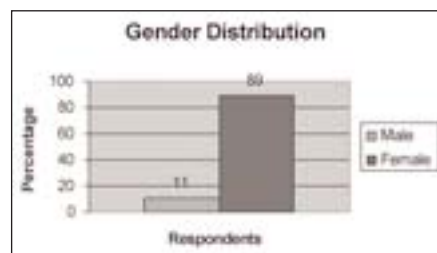


Figure 2: Gender distribution. Number of respondents n = 22

- **Question 3** (see Figure 3). This question was included based on the changes that

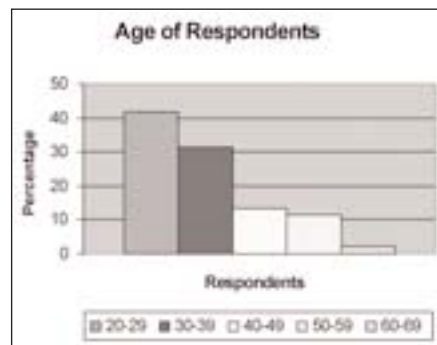


Figure 3: Age of respondents. Number of respondents = 227

have taken in radiography education over the past three decades.

- **Question 4** (see Figure 4). Approximately 60% of respondents have been practicing for

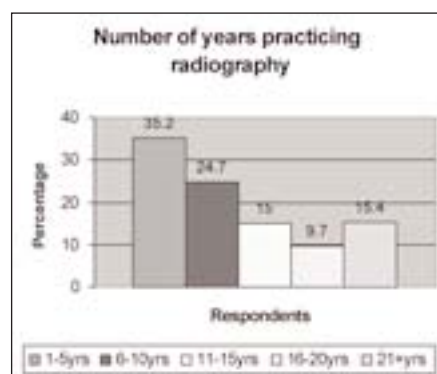


Figure 4: Number of years practicing radiography. Respondents: n = 227

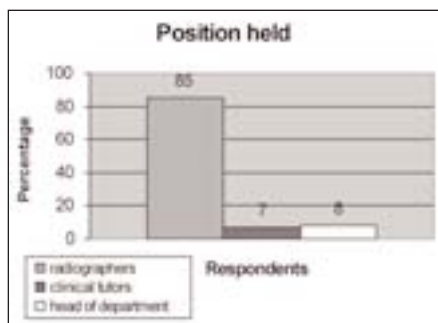
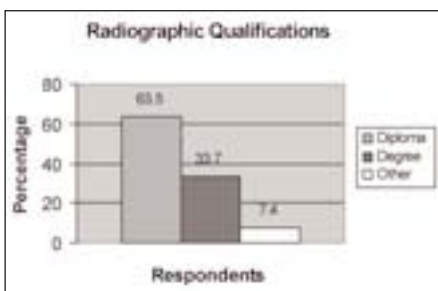


Figure 1: Position held. Number of respondents: n = 228

10 years or less. There were fewer respondents in the 16-22 years category and 15% of the respondents have been practicing for more than 21 years.

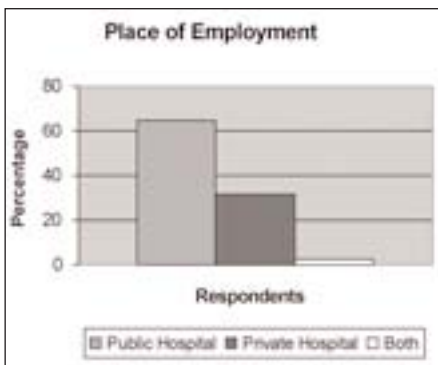
• **Question 5** (see Figure 5). The qualifications of the 17 respondents who ticked 'other' are listed below:

- Honours degree in computerised axial scanning (n = 1),
- Honours degree in radiotherapy (n = 6),
- Bachelors degree in ultrasound offered by a technikon (n = 3),
- Bachelors degree in nuclear medicine (n = 2),
- Higher diploma in radiography (n = 1),
- Tertiary education diploma (n = 1).



**Figure 5:** Radiographic qualifications. Number of respondents: n = 228

• **Question 6** (see Figure 6). Of the 116 respondents (i) 49.1% work mainly in a general department, (ii) 25.9% work mainly



**Figure 6:** Place of employment? Number of respondents: n = 220

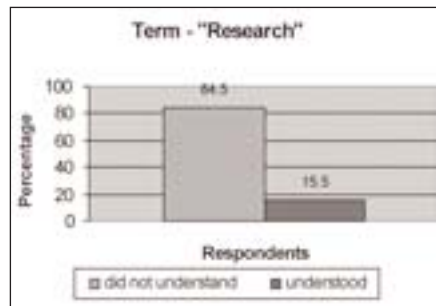
in a specialised department, and (iii) 25% work in both. From this data it may be presumed that the majority of respondents (74.1%) rotate through the general radiography department and are non-specialists, and 25.9% are specialists in the profession of radiography.

• **Question 7** (see Figure 7). The main terms used by the 136 respondents who did not understand the term 'research' were:

- 'Doing a study of a specific area and collecting information' (n=95, 99.8%).

- 'Looking for new possibilities or facts' (n=20, 14%).
- 'To read journals or articles' (n=5, 3.6%).
- 'Gather as much information as possible and write an essay' (n=8, 5.8%).
- 'A lot of work after hours to learn more about machines' (n=3, 2.2%).
- 'Increasing knowledge about a subject' (n=8, 5.8%).
- 'Improving techniques' (n=5, 3.6%).

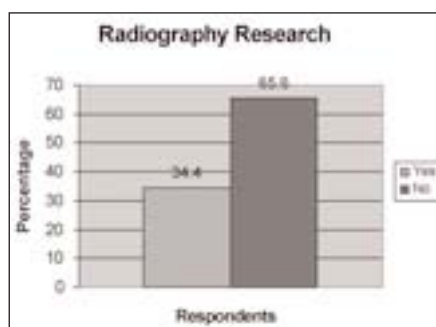
All of the above statements refer to the first stage of research, namely the information



**Figure 7:** What do you understand by the term 'research'? Number of respondents: n = 161

gathering process regarding a particular problem. This is referred to as exploratory research, where literature reviews, case studies and discussions with experts in the field generate answers to a particular problem. An in-depth analysis of the data was done to ascertain the relationship between the position held by the respondents (question 1) and their understanding of the term 'research'. It was established that 19 radiographers, four clinical tutors and two heads of departments understood what research entails, namely "the systematic process of collecting and analyzing (data) in order to increase our understanding of the phenomenon with which we are concerned or interested" [3].

• **Question 8** (see Figure 8). Sixteen respondents did not complete this question nor did they complete question 9 where



**Figure 8:** Have you undertaken any radiography research? Number of respondents (n = 212)

additional information concerning the research activities of the sample could be quantified. These missing frequencies may either be due to the fact that the respondents are not involved in research or they were not willing to disclose their research activities.

• **Question 9** (see Tables I and 2). This question pertains to research activities. The following results represent combination data for each of the categories requested:

- (i) independent research experience, and
- (ii) team research experience. Forty-two respondents provided the titles of topics.

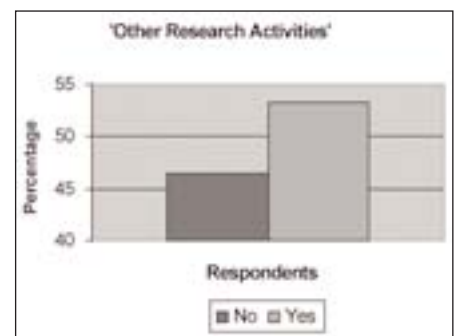
| INDEPENDENT RESEARCH  | NUMBER |
|-----------------------|--------|
| Individual            | 31     |
| Post-graduate level   | 26     |
| Undergraduate student | 24     |

A list of 60 titles was compiled. This figure was indeed very encouraging. Telephone interviews were held with the head of department or the designated staff member in order to establish whether any of these topics had been published. The main reason given for not publishing was that the local

| TEAM RESEARCH         | NUMBER |
|-----------------------|--------|
| Developing guidelines | 21     |
| Hospital research     | 14     |

radiography journal does not qualify for subsidies offered by the Department of Education.

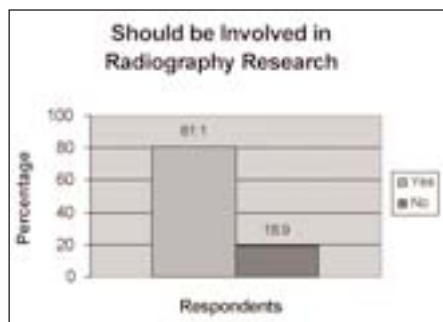
• **Question 10** (see Figure 10). Sixteen respondents were engaged in 'other' research activities; four of the respondents



**Figure 10:** Have you undertaken any other kind of research? Number of respondents: n = 30

commented on their 'research' activities unrelated to radiography. Two respondents were studying religion, one respondent has completed a diploma in fashion design, and one respondent has a degree in marketing. The remaining 12 respondents did not state the nature of their 'research'.

- **Question 11** (see Figure 11). Eleven respondents did not complete this question, 8 of these respondents did not complete question 12 either. The majority of



**Figure 11:** Do you feel that you as an individual should be involved in some aspect of radiography related research? Number of respondents: n = 30

respondents (81.1%, n = 176) affirmed that an individual radiographer should be involved in some aspect of radiographic research. The 41 respondents who did not believe that they should be involved in radiography related research gave reasons for their opinions in question 13. The responses to this question will be re-addressed in question 14. An in-depth analysis of the responses to this question was made with the position held by the respondent. Of the 176 respondents who felt that radiographers should be involved in some kind of research activity:

- 147 were radiographers,
- 13 were clinical tutors, and
- 16 were heads of departments.

It was interesting to note that one clinical tutor and three heads of departments felt that radiographers should not undertake research.

- **Question 12.** Respondents who replied that they believed that they should be involved in some aspect of radiography related research (as posed in question 11) provided reasons for their answers. One respondent stated that he/she would undertake research 'to keep me more interested in the field of radiography'. Eighty-three percent (83%) of respondents stated they would undertake research to advance the profession and 69.6% stated they would undertake research for their self-development. There are two aspects that may have elicited these responses. Firstly, radiographers have found themselves seeking recognition of their profession within the healthcare services. Secondly, radiographers have for many years been regarded as assistants to radiologists. With the role change taking place this concept of the profession may change.

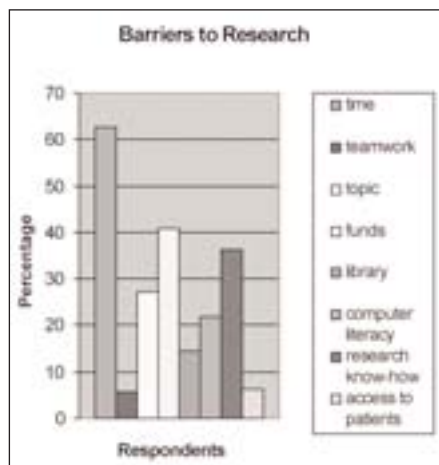
Almost half of the respondents (47.5%) stated they would undertake research to assist students. This response may be influenced by the fact that students seek assistance from radiographers and the latter feel that they need to hone their skills. Since the advent of compulsory continuing professional development (CPD) radiographers have no choice, they must be seen to be advancing their own knowledge to maintain their name on the register of the Health Professions Council of South Africa (HPCSA) in accordance with the legislation of the statutory body. Just more than a quarter (26.7%) stated they would undertake research for promotion purposes.

- **Question 13** (see Table 3 which is linked to this question). This question pertains to the respondents who replied in the negative to question 11.

**Table 3:** If 'no' to question 11, state who should undertake research. Number of respondents 32.

| STATEMENT  | RESPONDENTS |
|--|-------------|
| 'Specially appointed radiographers'                | 5           |
| 'People who are interested'                        | 4           |
| 'Clinical tutors'                                  | 8           |
| 'Students'   | 10          |
| 'People involved in training'                      | 10          |
| 'People interested in a career and not just a job' | 1           |

- **Question 14** (see Figure 14). Time involvement was seen as the greatest difficulty encountered. Lack of funding was seen as the next important difficulty followed by research know-how (36.4%, n = 83). Twenty-four respondents stated they did have 'research planning' in the bachelor degree course offered by technicians but did

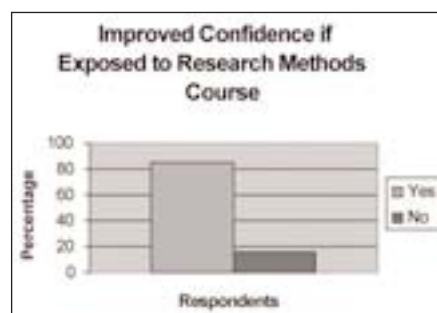


**Figure 14:** Which of the following factors make it difficult for you to undertake research? Please Note: in order to record the data the phrase 'barriers to research' has been used.

not undertake research. They stated that they would like to get involved in research but do not have the time. Two stated that they were not interested in research. In private practice there is not much time or funds available for research. The following comments were made by individual respondents:

- 'Limited library material and access to previous radiography research and published material'.
- 'It would be helpful to have a mentor'.
- 'Finding the right people to supervise the research and what to do with the results are the main problems'.
- 'Most radiography research is 'informal research'. Research was not introduced before qualifying'.
- 'Research is time consuming, not motivated to do research'.
- 'It is difficult to assemble a team due to shift work'.
- 'When not attached to a university or a technikon one has to travel long distances to access a library'.
- 'Severe personnel shortages make it difficult to undertake research'.
- 'None of the factors in the question make it difficult - one needs interest and initiative'.

- **Question 15** (see Figure 15). Eighty-four percent (84%) stated that their confidence level would improve if they had access to a research methods course. Based on this



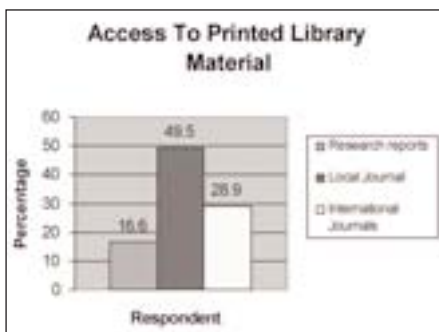
**Figure 15:** If you had access to a research methods course would you feel more confident in undertaking research? Number of respondents: n = 216

data and the comments of 21 respondents listed below there is an overwhelming need for research methodology courses to be instituted. These may be courses conducted in-house, followed with small projects to encourage voluntary participation in research activities. Comments from 21 respondents are presented below:

- Two stated that they have the time and basic knowledge but lack the practical experience.

- Two enquired as to whether such courses are available.
- Three stated that it would make research easier and would give a better understanding of what the basic principles are of research.
- Nine respondents stated that they are not sufficiently motivated even though they have had access to statistical analysis courses,
- Nine respondents stated that they need to have knowledge on how to co-ordinate research projects.

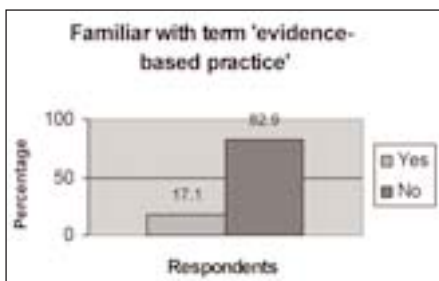
• **Question 16** (see Figure 16). Approximately 50% of the respondents had access to local journals. There were 16.6% of the respondents who stated they had access to research reports and 28.9% had access to



**Figure 16:** Do you have access to research reports, local and international journals?  
 [Authors comment: Data reflects a combination of responses to the question].

international journals. The responses to this question tie in with the responses recorded in question 14 where the barriers to research are recorded. As 14.4% of the respondents have difficulties in accessing a library this problem may be a contributing factor in the responses recorded to this question.

• **Question 17(a)** (see Figure 17). Eighty-three percent (83%) of the respondents are not familiar with the term evidence-based practice. Four respondents requested a group discussion about evidence-based practice.

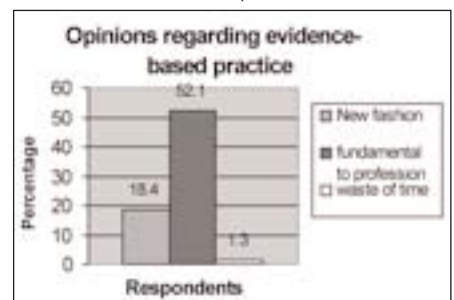


**Figure 17:** Are you familiar with the term 'evidence-based practice'? Number of respondents: n = 217

• **Question 17(b)**. What do you understand by the term 'evidence-based practice'? Forty-five respondents gave definitions. Thirty-three respondents (73.3%) defined the term, and 12 (26.7%) did not define the term correctly.

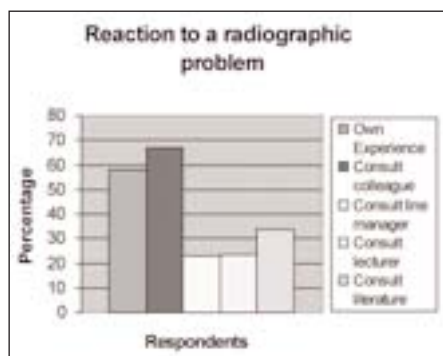
• **Question 18** (see Figure 18). Whilst there were respondents who did not complete question 17, they proceeded to complete this question. More than half (52.1%) felt that evidence-based practice was fundamental to the profession. Approximately 20% felt that it was a new fashion or a waste of time. With reference to question 17, even though approximately 80% of the respondents did not offer a definition for evidence-based practice, there were respondents who felt that evidence-based practice is fundamental to their practice. The question arises as to whether they based their opinions on the questions that followed question 17 or on prior knowledge. A further in-depth analysis between question 11 and question 21 was done to compare the responses of those respondents who felt that radiographers should be involved in some kind of research in order to

establish which factors would facilitate evidence-based practice. The following responses were recorded as follows: money {82 respondents}, better dissemination {41 respondents}, time {70 respondents}, library facilities {55 respondents}, access to the Internet {66 respondents}. From these results it can be concluded that more time, money, access to library facilities and the Internet would facilitate evidence-based practice.



**Figure 18:** Would you regard evidence-based practice as a new fashion, fundamental to your profession or a waste of time? Number of respondents: n = 157.  
 [Authors comment: The data presented are combination figures]

- **Question 19** (see Figure 19). More than two thirds (67.1%) of respondents would be inclined to consult a colleague followed by 58% who would act on their own opinion.



**Figure 19:** When confronted with a radiographic problem would you act on own experience, consult a colleague, seek advice from a line manager, consult a lecturer, search for a solution in literature?  
 [Author's comment: The data represents combination figures].

Seeking advice from a line manager, or a lecturer or seeking information from the literature scored low percentages (23% and 34% respectively). From these responses it can be concluded that communication strategies need to be re-addressed. Also the access or availability of literature may be a factor for the response to this question. Five attached a rating scale next to their responses indicating their first reaction as 1 and last reaction as 5. The inclusion of a rating scale may have elicited significant insight into the respondents' reactions.

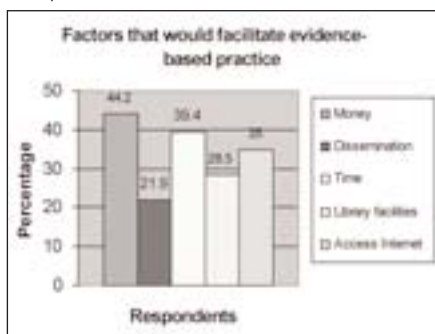
- **Question 20** (see Figure 20). The components of evidence-based practice skills revealed that 86.6% of respondents would share information with colleagues, 20.1% would seek for more evidence, 40.3% would integrate the evidence with practice. However 18.4% would integrate their findings into practice and 5.7% would measure the outcome. This may well be due to the fact that radiography departments



**Figure 20:** When finding evidence to solve a radiographic problem do you share the information with colleagues, seek for more evidence, integrate the evidence with practice, measure the outcome, critically appraise the literature?

could have existing guidelines and protocols in their departments and may be compelled to continue using them due to financial constraints or there may be a lack of facilities such as equipment, staff or money to support implementation of a particular research outcome.

- **Question 21** (see Figure 21). Respondents indicated that money and time were the main factors that would increase evidence-based practice (44.2% and approximately 40% respectively). Davies in Dawes [4] is of the opinion that financial incentives do not necessarily increase evidence-based practice. Better dissemination of information scored the lowest percentage, 21.9%. This response corresponds with the opinion of Davies in Dawes [4] where he states that there is a "passive diffusion model which assumes that



**Figure 21:** Which of the following factors would contribute to an increase in evidence-based practice - money, better dissemination, more time, greater library facilities, better access to the internet?  
 [Author's comment: data represents a combination of responses].

clinicians and other health professionals read or hear about research evidence and then adopt this in their practice". Better dissemination of knowledge therefore does not necessarily improve evidence-based practice research. A more effective way of bringing about change is using the active-dissemination model. This involves the synthesis and critical appraisal of research evidence [4].

- **Question 22** required the respondents to attach additional comments if applicable. Twenty-two (9.6%) provided additional comments.
  - Two commented on the design of the questionnaire. They felt it was easy to complete, well set-out and did not take too much of their time to complete.
  - Three wrote messages of encouragement.
  - Four stated that they had never heard

of evidence-based practice and would appreciate additional information.

- Two stated that they appreciated the introduction of compulsory CPD by the HPCSA because it encourages lifelong learning.
- One stated that with the introduction of digital radiography, many projects that related to quality assurance of the image could no longer be done and that radiographers have become 'button pushers'.
- Five felt that their workload was so much that they did not even have time for their family or hobbies and could not see themselves taking on any research projects.
- Three felt that radiographers in the rural areas were particularly disadvantaged in terms of access to equipment, libraries and CPD programmes.
- Two wanted information regarding how this study would impact on the profession.

## Conclusion

The survey was conducted amongst radiographers involved in a variety of clinical settings. The survey revealed that some radiographers are involved in research but it was not possible to ascertain whether research findings were implemented in clinical practice.

For the radiography profession, evidence-based practice provides a framework for group problem solving. Based on personal experience there is a shift in terms of a development towards a trend of collective decision-making about care delivery. The environment where radiologists and radiographers make their decisions is changing with the growing computer based integrated health care enterprise. Currently, these changes are used to ensure that there is optimal discussion in order to decide on best practice and best care.

Given the current momentum of evidence-based practice, mechanisms for dissemination need to be integrated into health care policy and management. There are a variety of initiatives to encourage practitioners and policy makers to assess and implement research evidence. Unquestionably, the practice of evidence-based radiography requires the acquisition and development of new skills in literature searching and critical appraisal. Bready [5] published a comprehensive article that offers radiographers a systematic approach to finding evidence.

The advantages of practicing evidence-based radiography outweigh all the disadvantages and limitations. Individual radiographers are enabled to

routinely upgrade their knowledge base, improve their understanding of research methods and use data in a more critical manner. The survey revealed that there is a tendency for personal development over and above development for promotion purposes.

With regard to the future, the introduction of CPD may assist providers of continuing professional development programmes to adopt the principles of evidence-based education to assist in the process of enhancing all aspects of radiography. However, the introduction of evidence-based education does not have to wait for the implementation of outcomes-based-education. Seeking evidence for a particular problem is indeed very exciting, however if the evidence is not incorporated into practice it becomes a mere academic exercise.

## Acknowledgements

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