

Lack of Motivation among Radiology Technologists to Conduct Clinical Research at KFSH&RC

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Abstract

The Department of Radiology in King Faisal Specialist Hospital and Research Center is committed to excellence in research, particularly in pioneering new advances in technological innovation. As one of the top Radiology Departments in the world, it is recognized for its strength in physics, engineering, molecular imaging and clinical medicine.

The Radiology Department provides clinical services in Diagnostic Radiology, Interventional Radiology, Ultrasound, Vascular Laboratory, Cross Sectional Imaging (CT) scan, Magnetic Resonance Imaging (MRI), Nuclear Medicine and Positron Emission Tomography (PET). There are also several cooperative interdepartmental activities with the Department of Surgery, Department of Oncology, Internal Medicine, and Emergency, etc.

This study is enlightened the factors that associated with lack of motivation to conduct clinical research within radiology technologists whether this factors are quantitative or qualitative to improve the research activities within the area and add benefit of our joint clinical projects through participation of faculty from the College of Applied Medical Sciences, School of Medicine and other areas in teaching and learning research activities that enrich the educational experience and create a multidisciplinary collaborative research environment.

Special emphasis is placed on the teaching of radiology technologists both during their internship a year rotation in the department which is part of their regular yearly curriculum and also during their career to help improving the experience and maintain the medical and clinical productivities outcomes. The goal of the research initiative in the Department of Radiology is to apply new and innovative technologies to challenging clinical problems, in order to improve patient health, practice quality, and scientific knowledge.

Keywords: Radiology; motivation; research; conducting.

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1. Introduction

The field of radiology has grown significantly over the past 15 years. This can in large part be attributed to advances in research and, indeed, the future of the field depends on this continued tradition. Although supporting to radiology research has increased substantially in the past decade, much of the research is being carried out by researchers who are not technologists. There are clear indications that too few technologists are performing research for a variety of reasons, including a shortage of time, training and manpower. At the same time, there are indications that technologists (seniors, juniors and students) are interested in a future dual clinical technical research career. The field of radiology has experienced remarkable growth in the past 15 years. Existing modalities have been improved upon extremely (e.g., computed tomography [CT], ultrasonography), and new modalities have been developed (e.g., magnetic resonance imaging [MRI], positron emission tomography [PET]). Digital imaging is increasingly replacing traditional photographic records. There is so much to learn, and so many imaging possibilities, those diagnostic technologists are often sub specialized by modality. Expressed lack of academic, research-oriented technologists will affect after period of time the department productivity. The key to the past and future success of radiology, both diagnostic and interventional, is research. Research depends on funding and resources, manpower, skill and training, motivation and opportunity of the technologists. It is well known that there is a shortage of academic technologists, particularly those performing high-quality researches. A lack of radiology research may have devastating effects on the future of the specialty, and technologists may quickly find themselves falling behind competing specialties. The future of strong research carried out by technologists is the motivation and ability of trainees to perform academic research. The purpose of the study is to explore the factors associated with poor motivation level among radiology technologists to conduct clinical research.

2. Literature Review

It is common knowledge that research productivity among technologists in the Radiology Department at King Faisal Specialist Hospital and Research Center is essentially not existent. Virtually no publication or research projects have appeared in the last decade. This is a very large and well equipped department, and radiology physicians have also been asked why no research is conducted to capitalize on their resources. But, as the literature shows, this is not a unique situation.

The United States National Institute of Health's (NIH) defines clinical research as: Patient-oriented research; epidemiologic and behavioral studies; and outcomes health services research. There are many studies discussing lack of conducting clinical research among Radiology Technologists in the West. Many of them have tried to develop an approach to treat this problem in different ways.

The authors in reference [1] conducted a joint multiphase study at the University of Cincinnati and Ohio State University to report major challenges and opportunities in Clinical Research Informatics (CRI). They used a four-phase methodology to develop a systematic understanding of the definition, challenges, and opportunities inherent to CRI. As their data show, the authors deduced 13 categories, including problems with research planning, data access, educational needs, fiscal issues, leadership needs, etc.

Among the limitations which they found in their study were: biases in qualitative analyses due to use of internal participant observations; possible selection bias based on dependence on self-selective convenience samples; and assumed failure to capture all the challenges and opportunities facing the CRI domain. The use of qualitative multi expert validation techniques mitigated these short comings somewhat and enhances the validity of their findings.

The authors in reference [2] in the University of Patras Department of Clinical Radiology., emphasized three issues: the importance of continuous medical education; improving interdepartmental communication and collaboration; and adopting well documented protocols throughout the hospital setting to reduce costs and minimize risks. However the study did not constitute formal research. Rather it used informal observations and discussions to render its conclusions.

The authors in reference [3] conducted a panel in the Department of Radiology, Columbia University Medical Center, to discuss ways to enhance research productivity and broaden the base of research strength in as many academic radiology Departments as possible. They suggested five important resources for a research program: enlightened leadership; a culture that values research; a core resource strategy; ability to leverage institutional resources; and ongoing academic support from the dean.

The experienced barriers to success while they found were "(a) lack of support from the dean;(b) time required to provide clinical service; (c) diminished income associated with doing research rather than clinical service; (d) lack of protected time for conducting research; e) lack of appropriate space to support competitive research; (f) perception of the role of radiology in the institution as a service provider only; (g) misperception and poor communication within radiology, which causes lack of respect between clinical radiologists and investigators both physicians and no physicians; (h) Cultural conflicts between departments; and (i) selection of residents who have little or no interest in research." As in the previous study the panel findings did not constitute formal, controlled research.

The authors in reference [4] from the University of Illinois College of Medicine, asserted in their review of radiology articles indexed in the National Library of Medicine Medline database that research productivity in academic Radiology can be measured on both the departmental and individual levels by using publication volume and quality. Their subsequent analysis encompassed all research output from 1996 through 2003. These data concerned the residency program size and faculty ratios: the number of fellows and the ratio of fellows to faculty accounted for between 75% and 88% of all variation in research output between departments, depending on the productivity measure used. They claimed that the importance of continued government support for academic research in Radiology department cannot be overemphasized.

While these studies offer many useful points, the present study, rather than relying on informal and document study methods, will utilize a survey research methodology, both to yield controlled data and to broaden the scope of data sources to all practitioners.

3. Aim of the Study

To explore the factors associated with poor motivation level among Radiology Technologists to conduct clinical research. This study attempts: To study the differences of motivation factors between female and male technologists to conduct clinical research, also to study the differences of motivation factors between different levels of experience, (senior with more than 10 years working in KFSH&RC and junior with less than 5 years working in KFSH&RC), and to study the differences of motivation factors between different level of degrees (diploma, bachelors, master). In addition this study begins to assess appropriate needs to support competitive research between technologists (e.g. space, time, and resources).

3.1 Study Area

The study was conducted in all Radiology sections at King Faisal Specialist Hospital and Research Center, These are: Nuclear Medicine, Ultrasound, Fluoroscopy, Angiography, Computed Tomography, Magnetic Resonance Imaging, Mammography, X-Ray and Bone Mineral Densitometry BMD. It confined for Radiology technologists at King Faisal Specialist Hospital exclusively. Other KFSH&RC department and other hospitals are not included.

3.2 Methodology

The research is conducted by using two methods:

- A. Qualitative Research.
- B. Quantitative Research.

For the Qualitative research, five focus groups were conducted.

For the Quantitative research a questionnaire were distributed.

3.3 Study Design and Sample Size:

Cross-sectional study design: The questionnaire and the focus group were distributed among all technologists of the KFSH&RC Radiology Department. Subgroups were formed to examine possible differences in motivation between them: the subgroups were formed include gender, age, expertise level, and degree.

3.4 Sample Size:

Input criteria: Radiology Technologists at King Faisal Specialist Hospital. The projected sample size for this study is 100 total.

3.5 Sampling Technique

All 110 KFSH&RC Radiology Technologists will be included. This is the entire study group population full participation depends on supervisor distribution. It is anticipated that follow up reminder must be used to achieve high response rate.

Advantages:

- No members are omitted.
- Ideal for statistical purposes (high N).

Disadvantages:

- Requires an accurate list of the whole population.
- Expensive to conduct as those sampled may be scattered over a wide area.
- Depends on supervisor distribution.
- Follow up reminders must be used to achieve high response rate.

3.6 Data Collection methods, instruments used measurements:

The Quantitative research conducted using a two page questionnaire (appendix 1) with Likert-type scales and qualitative comments. This was forwarded by the principal investigator to the quality assurance department, who distributed it to section supervisors during their meeting for administration radiology technologists in their charge. E-mail reminder used and the data of questionnaires collected by the P.I.

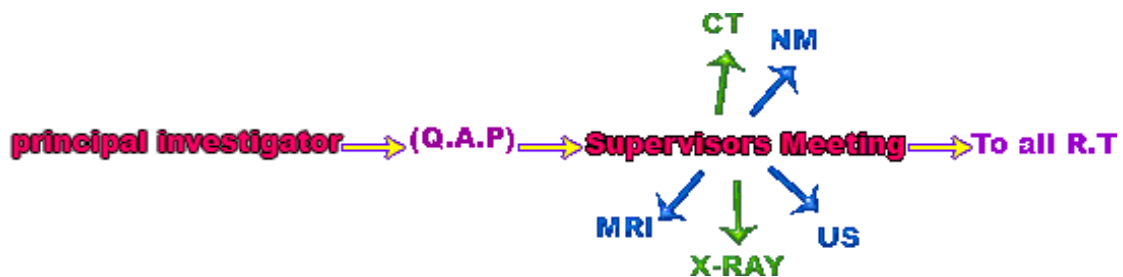


Figure 1: The scheme of questionnaire distribution

The qualitative research conducted using focus group five focus groups were conducted until saturation was reached when there is no addition or conflicting has been occurred and all questions have been answered. Every meeting had specific objectives and intended outcomes. The brainstorming technique is proper to bring up different perceptions, points of view, and thoughts, without worrying about censorship. The duration of each was 30-60 minutes, scheduled according to the participants' requests. Each group discussion was tape recorded. Each facilitator (one per session = 5 total) was trained by the principle investigator. Participants include technologists from different departments.

- Guidelines for Focus Group discussion:
 1. Importance of research.
 2. How to enhance radiologist research productivity.
 3. Research barriers.
 4. Hindering and motivating factors.
 5. Recommendation for improvement.
 6. Contribution of research to personal and professional development.

3.7 Data management and analysis plan

In the Quantitative research by using the SPSS program which analyze the data collected by the questionnaires from 30 technologists of 100. I found three main factors affect the productivity of research, they are:

- Time
- Training
- Support from dean

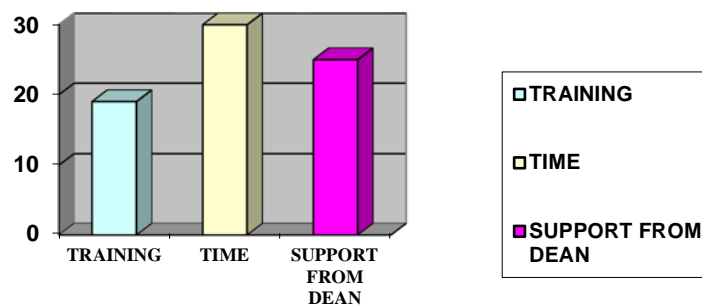


Figure 2: Factors affect the productivity of research

In the Qualitative research data were analyzed using Content Analysis – Shared Themes across groups. The main findings have been divided into three categories

3.8 The Importance of Research

- Improve quality of patient care.
- Enhance technologists' research knowledge and keep them updated.
- Research leads to better professional performance.

- Research contributes to personal development.
- Research contributes to institutional recognition.
- Sharing findings with others increases mutually beneficial collaboration.

3.9 *Research Barriers*

- Research phobia.
- Time constraints.
- Financial constraints.
- Lack of resources – facilities, equipment, etc.
- Lack of availability of references.
- Lack of support from leaders.
- Cultural factors including the perception that radiologist job description is only limited to service provision.

3.10 *Recommended Motivating Factors*

- Protected time for research.
- Appreciation and recognition from Department leaders.
- Team work and collaboration in conducting research.
- Moral and financial support.

Table 1: Analysis the factors affect the productivity of research

Lack of protected time for conducting research	The department has long list of patients load whether out-in patients,
The support from dean	The radiology department is always supporting the ideas that will lead for a good feedback and outcomes to the patient care but the supporting might be affected by the conflict of interest if the research problem was not matching the needs of the dean or culture.
Training	Major roadblock to advancing research is the lack of experienced technologists to conduct research.

4. Discussion

A Qualitative study proved to be an appropriate tool to explain the data regarding issues of motivation to conduct clinical research among radiology technologists.

This is the first study in Kingdom which provoked the opinions of radiology technologists toward research productivity. The study showed radiology technologists are aware of the problem as well as the barriers and the motivation factor, this is very important for establishing a program to enhance the research skills.

5. Recommendations

- Develop a research supportive culture in radiology departments based on a vision, incentives and rewards system.
- Recruit more PhDs and MD/PhDs into radiology departments and promote cooperation and communication between them and the technologists.
- Better research outcomes will be achieved by the full support and supervision from medical experts, technical experts, and medical physics experts.
- Development of a stronger research education curriculum as part of technical training.
- Assure available personnel and other resources for research mentoring in Radiology.
- Financial support.

6. Conclusion

- Main Challenges: In the radiology departments that are not currently successful in research, the biggest challenges may be:

- Getting started to create a research culture.
- Promoting the use of interdisciplinary collaboration
- Setting validation techniques/standards to enhance the validity and productivity of the research.

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