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## Role extension: The needs, perceptions and experiences of South African radiographers in primary health care

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### Abstract

Escalating current health needs coupled with the dire shortage of radiologists saw many countries abroad, led by the United Kingdom, adopting radiography role extension. Radiography role extension is a practice whereby radiographers adopt duties that were previously only within the scope of practice of radiologist. This study aimed to evaluate the need, the perceptions and the lived experiences of radiographers working in primary health care with reference to radiography role extension.

An interpretive qualitative research approach was utilised in trying to understand lived experiences of radiographers working in primary health care (PHC) institutions in Cape Town. A questionnaire was utilised as the data collection tool.

An analysis of the qualitative data revealed six themes; (i) medico legal aspects, (ii) education, (iii) newly qualified and inexperienced medical officers, (v) improving service delivery, (vi) the radiographers' experience, and (vii) benefits of reporting radiographers.

It was concluded that there is evidence to support the need for radiographers to extend their roles into report writing within the PHC level. The benefits of this would be improved service delivery and optimum utilisation of the radiographers' skills and knowledge.

### Keywords

Image interpretation , service delivery

### Introduction

The dire shortage of radiologists, coupled with the high demands for health services in South Africa, requires that the health care system be an adaptive and fluid one. In South Africa the increase in the work load of all medical specialists including those in radiology <sup>[1]</sup> has led to an increased strain on the health care professionals and the quality of services they provide. The shortage of radiologists in countries abroad, and all over Africa, is attributed to an increase in the patient to radiologist ratio <sup>[2]</sup> as well as the attraction of these specialists towards more specialized tasks, such as computed tomography (CT), magnetic resonance imaging (MRI) and interventional studies <sup>[3]</sup>. Consequently a gap is identifiable in the reporting of plain films, especially in the rural and primary health care sectors where there are no onsite radiologists. Primary health care (PHC) level institutions treat ambulatory patients, or people who are able to walk and do not need to be confined to bed. PHC services are run by nurses, and although doctors visit many clinics regularly, patients needing specialised level of care are referred to institutions at the secondary level <sup>[4]</sup>. Radiographs are sent to secondary level institutions for radio-

logical reports <sup>[5]</sup>. Radiographers at PHC facilities are usually the only health professionals with knowledge and skills to adequately interpret radiographic images. However their scope of practice prohibits them from fully engaging in the role of image interpretation. The Health Professions Act No. 56 of 1974 clause 10 (C) <sup>[6]</sup> stipulates that a radiographer may only discuss the radiographic appearances with the referring clinician; it also states that a radiographer shall only comment on images that he/she has performed <sup>[6]</sup>. This legislation states that a radiographer shall not perform duties that exceed his/her capacity of registration. Consequently a radiographer who discusses a patient's radiographic examination outcome with a medical officer who did not request such an examination is in contravention of the law. Despite the fact that South African (SA) health needs warrant that radiographers be fully engaged within the management of the patient, through image interpretation, the law restricts such involvement.

Although hospitals require radiology departments to support emergency departments, with continuous high-quality radiology services, staff shortages restrict the continuity of these services <sup>[1]</sup>. Furthermore the level of clinical radiology

continues to escalate year on year both in terms of volume of work to be carried out and the nature, complexity and diversity of that work. As a result some radiological reports are not received in sufficient time to influence patient management <sup>[7]</sup>. Therefore, the potential of radiographers' experience, coupled with training, can never be underestimated with reference to addressing current health needs <sup>[8]</sup>. Countries abroad, led by the United Kingdom (UK), improved their service delivery through the introduction of radiography role extension <sup>[9]</sup>. Radiography role extension into image interpretation is a model that is pivotal, integral and imperative in the process of addressing health care needs in South Africa. Radiography role extension, especially image reporting, is a well documented topic and has led to positive changes within the health care system in the UK <sup>[10]</sup>. The SA health care system can only experience similar changes if, and when, radiographers start to actively get involved in researching their current practice and identifying areas of possible development. However, complacency within the SA radiography profession has deterred professional development resulting in the role of radiographers still primarily being viewed as technical <sup>[10]</sup>. A lack of research in SA to support the

need for extended roles in radiography is a deafening silence contrasted by the loud health care needs for such roles. This study sets out to establish the current role of the SA radiographer within the clinical environment. It also aims to identify challenges and gaps that may advocate for role extension.

### Methodology

An interpretive qualitative research approach was utilised to try to understand lived experiences of radiographers working in PHC in Cape Town. This approach was utilised because it allowed for an information rich narration of a population of health care workers, working without the immediate aid of a radiologist. It aimed to capture data of the radiographers' lived experiences, and to harness and report their meaning and understandings in context<sup>[11]</sup>. Ethics permission was sought, and granted, by the Cape Peninsula University of Technology ethics committee, as this was a study completed in partial fulfilment for a Baccalaureus in Technology (BTech) degree in radiography. Permission was granted by the head of the radiography services of the PHC institutions.

The study population was radiographers who worked in PHC centres in Cape Town in 2007. At the time of the study there were thirty five (n=35) practicing radiographers. They were all registered with the Health Professions Council of South Africa (HPCSA).

### Objectives of the study

- To evaluate the needs, the perceptions and the lived experiences of radiographers working at the primary health care level.
- To compile a narrative report of the PHC radiographers on their experiences, meanings and understandings of the need for role extension at this level of care.

Questionnaires were sent via internal mail to all the PHCs in Cape Town that had x-ray departments. Enclosed with the questionnaire was an information letter stating the nature of the study; its aim; the voluntary nature of participation and the right to withdraw during the study. A fourteen day deadline for return of completed questionnaires was stipulated on the information sheet. Completed questionnaires were sent back via the internal mail to the institution of employment of the researcher. Consent was assumed when the respondents returned the completed

Table 1: Demographic information for the population.

Variable		Frequency	%
Gender	Female	24	92
	Male	2	8
Work experience	1-5 years	5	19
	6-10 years	2	8
	11-20 years	6	23
	21 plus years	13	50

questionnaire. Confidentiality and privacy were maintained.

### Data analysis

The completed questionnaires were numbered and transcribed for detailed thematic analysis. The analysis aimed to capture and narrate the subjective experiences and understandings of the participants. Reading and re-reading of the transcribed information led the author to identify key themes which were subsequently used to establish connections and associations with the aims of the study.

### Results

A return rate of 74%, n=26 was achieved from the population of n=35. The majority of the respondents were females (92%). Gender representation reflects gender demographics within the profession of radiography (Table 1). This table also shows the break down of the population in terms of work experience. The majority of the respondents had a work experience of >21 years (n=13; 50%). The other groupings of work experience were represented to a much lesser extent (1-5 years n=5, 6-10 years n=2 and 11-20 years n=6). The analysis of the qualitative data revealed six (6) themes which are listed in Table 2: medico-legal aspects; education; newly qualified and inexperienced medical officers; improving service delivery; the radiographers' experience; the benefits of having a reporting radiographer. The verbatim comments from respondents are presented in italics.

### Analysis of themes

(i) **Medico- legal aspects:** The majority of respondent indicated a willingness to give a verbal opinion to a referring clinician about radiographic appearances. When asked whether they would be willing to provide a written report they expressed reluctance due to current legislative restrictions. It is however of interest to note that these respondents felt that radiography education, although to a much lesser extent than that of radiologists, has prepared

them to identify salient abnormalities on radiographs even though the law prohibits expression of that knowledge in the form of a written report. Accordingly respondent three, who has >21 years experience, explained that currently the *'ultimate decision/diagnosis is MO/radiologist's responsibility as at present radiographers are not protected by law (stand under correction) should they diagnose incorrectly'*. Increasing health care demands, coupled with scarce resources in countries abroad, brought about changes in government policies that promote flexible and creative use of allied healthcare professional skills<sup>[12]</sup>. A similar healthcare policy change is relevant, imperative and a need within the SA healthcare system, in order to create a space for radiographers to practice extended roles within a legal framework. Such legislative change would enable radiographers to fully respond to, and, address the current health care needs.

(ii) **Education:** The majority of the respondents indicated that radiography education prepared them to give a verbal opinion; however more attention should be invested in learning and teaching of image interpretation skills and knowledge at undergraduate level. Respondent nineteen (with 1-5 years experience) asserted that *'greater attention to pattern recognition should be given at training institutions (especially in 2<sup>nd</sup> to 3<sup>rd</sup> year of training)'*. Most of the respondents with more than 21 years of radiography experience indicated that their education only imparted on them the skill of 'taking' the x-rays and not image interpretation. They gained image interpretation skills during their many years of clinical practice. For example, respondent four (>21 years experience) explained that... *'training provided me with the necessary skills to do an x-ray. Experience taught me to give verbal reports on x-rays'*. Apart from the effects of experience on image interpretation skills, the respondents indicated that further education, in the form of a post graduate degree and/or a short course, is necessary if radiographers are to fully practice image

interpretation. All the respondents felt that with proper training radiographers would provide excellent written reports.

(iii) **Newly qualified and inexperienced medical officers:** One of the emergent themes that could be said to be the driver of radiographers' volunteering their verbal opinions and advice on radiographic appearances was the lack of experience of newly qualified medical officers to interpret images. The respondents reported that most of the doctors working in PHC institutions were newly qualified and not always able to identify abnormalities on radiographs. One of the respondents (with 1-5 years experience) explained that *'...many of the medical officers are newly qualified and inexperienced...some fractures are missed and only picked up when the films come back to me'*. Respondent twenty (11-20 years experience) shared the same sentiments: *'At PHC only community doctors are on duty. I have seen that doctors missed fractures and chest pathology.'* The deployment of mainly newly qualified medical staff within the PHC is also evident in secondary, and some tertiary, hospitals during emergency after hour duties [13].

Arguably at times the lack of resources in South Africa is in the form of qualified and experienced personnel rather than funds. A lack of human resources, especially experienced medical professionals, means that decisions about patient management are made quickly and usually based on the opinions of junior staff [1]. Therefore the roles of particular members of the multidisciplinary team, like radiographers, should be adaptive and responsive to optimise service delivery. Research studies have reported that by alerting clinicians to an abnormality requiring urgent attention, a radiographer may enhance the effectiveness of junior clinical staff [8]. It is evident that by providing a verbal opinion, a radiographer is directly and indirectly enhancing service delivery through supporting the medical team.

(iv) **Improving service delivery:** A study by Williams (2009) indicated that there is a need to improve radiology services, especially in the public healthcare sector, and to extend the professional role of the radiographer to include trauma and emergency plain x-ray reporting [10]. Good patient care and optimum service delivery are central to the profession of radiography and radiographers should always strive to optimise these aspects. It emerged from the respondents that they

provided verbal opinions to clinicians, about radiographic appearances, to facilitate and optimise management, care and service available to the patient. Since PHC does not provide advanced service critically ill patients, for example, are referred to secondary healthcare level institutions. Crucial to this referral system is the identification of these patients using different clinical methods and parameters. Radiographs are among the parameters used in the identification of patients who need to be transferred to the next level of care. It is imperative that radiographs are used effectively and optimally in order to direct patient management and to prevent delays and mismanagements. In a clinical environment, where there are no suitably qualified personnel to report on radiographs, radiographers should strive to provide their best possible advice to facilitate patient management.

As members of a multi-disciplinary team radiographers should find ways to improve their practice and clinical impact while continuing to provide optimum service delivery. For example, a respondent (>21 years experience) explained that *'it is important to work together as a multi-disciplinary team to minimise mistreatment of a patient and also to identify cases that should be treated at a higher level as soon as possible. All this add to better patient care.'* Central to the improvement of the radiography profession and its clinical impact is support and synergy from all the professions whose interest are for the patient's wellbeing. A respondent (with 11-20 years experience) explained that *'...we work as a group and the patient comes first, and we don't want patient to be mismanaged. Working together as a team will ensure better and proper diagnosis of the patient.'* Sonnex and co-authors [8] agree that by alerting clinicians to abnormalities requiring urgent attention, a radiographer may help to reduce delays in appropriate patient care.

(v) **The radiographers' experience:** Experience and exposure to a particular clinical environment emerged as a factor that has a direct bearing on harnessing and refining image interpretation skills. Respondents felt that education was important to introduce knowledge (facts), terminology and description of abnormalities. However they felt that experience and exposure enhances one's ability to detect and identify abnormalities on radiographs. According to respondent sixteen (11-20 years experience) *'the ability to give an*

*opinion comes with years of experience rather than what is learnt in the years of training, because you see the same thing (pathology) more often.'* Respondents with 6-10 years experience resonated this point of view: *'...the more one is exposed to a particular scenario the more often one is able to give the precise opinion!'* There was a general consensus that even with the most appropriate education it is experience that harnesses the application of image interpretation skills. Such views resonate with those of Sonnex and co-authors [8], namely that it is only with suitable experience and after tuition that radiographers can feel confident in assessing radiographs for pathological changes. The majority of respondents indicated that currently they are utilising image interpretation skills that they obtained over many years of being in a clinical environment. For example, respondent eighteen (>21 years experience) explained that her ability to identify abnormalities was from *'... experience rather than education'* and that her experience equipped her with the necessary skills to give a verbal opinion. However, it is evident, that the combination of experience and training increases a radiographer's ability, confidence and accuracy when assessing radiographs for abnormalities.

(vi) **The benefits of having a reporting radiographer:** This theme is probably one of the most documented topics in radiography literature. The benefits of having a reporting radiographer were indicated as the reduction of patient waiting times, recognition of radiographers' endeavours coupled with job satisfaction and prompt service delivery, amongst other things. These benefits were also noted in studies done abroad [12, 14]. Respondent ten (with experience of between 11-20 years), for example, stated: *'If radiographers are able to give a written report, I think they would feel more valuable in the medical team and not just pressing a button. It would increase their moral and better job satisfaction could be achieved especially in community health, as the daily grind can be quite routine. It would also allow a better service delivery to patients as appropriate treatment could be given soon.'* Central to the benefits of reporting radiographers is the provision of optimum service to patients. The value and morale of a radiographer within the multi-disciplinary team may positively increase with increasing responsibility towards the patients. This may bring about a change in the attitude

of other healthcare professionals towards the role of radiographers in the management of patients.

## Discussion

This study reports four factors as having a negative impact on service delivery in the South African PHC system: (i) newly qualified medical officers who are inexperienced in image interpretation, (ii) the absence of radiologists, (iii) the failure for the radiography education to prepare radiographers for these challenges, and (iv) the legal restriction placed on radiographers who want to respond to these current healthcare needs. Consequently radiographers in PHC are willing to re-evaluate and redefine their role within a multi-disciplinary team to address these challenges. The emergent themes from the study (see Table 2) are evident of radiographers' experiences, expressions and understandings of circumstances surrounding their current practices and the need for role extension.

The current radiography education and training does, to a limited extent, prepare radiographers to interpret radiographic images. The demand for an all inclusive, adaptive, service oriented and patient centred healthcare system requires that educational institutions review and adjust their current curriculum to include modules which specifically pertain to image interpretation for radiographers. Currently there is a lack of formal training in image interpretation for South African radiographers which requires a review of the existing post graduate courses<sup>[10]</sup>. The need for further education, specifically for image interpretation was raised by the respondents. One of them stated: *'...with proper training radiographers would provide excellent reports'*. It appears that radiography education does impart image interpretation knowledge to a limited degree, however there is lack of extensive application of that knowledge into practice.

The respondents indicated that there are no onsite radiologists in their PHC institutions and that a radiologist's report takes  $\pm 14$  days to be produced and presented for patient management. This long turnaround time of reports is in direct contrast to the expectations of the radiology stakeholders (patients, referring doctors and hospital managers) of a 24 hour production and presentation of a report<sup>[15]</sup>. The dire shortage of radiologists is a well documented topic and a cause for concern even more so at the PHC level where the majority of

Table 2: Themes that emerged from the study.

Emergent themes
1. Medico legal aspects.
2. Education.
3. Newly qualified & inexperienced medical officers.
4. Improving service delivery.
5. The radiographers' experience.
6. The benefits of having a reporting radiographer.

medical officers are newly qualified and not always able to identify abnormalities on radiographic images. The employment of newly qualified doctors at the PHC level is a strategy that is arguably designed to respond to the staffing needs of the health care system at this level of care. An ideal situation would be where the newly qualified medical officers get on-going support from their well experienced colleagues within these institutions but such a scenario is not always possible due to human resources constraints. It is therefore important that members of the multidisciplinary team, specifically radiographers, within the PHC sector be adaptive to support these medical professionals with regard to image interpretation. Furthermore an adaptive, multidisciplinary team which can function within, and under, multiple roles is imperative if patients' needs are to be optimally addressed.

Why radiography role extension in South Africa? This can be answered as follows. The centrality of optimum service delivery in health and health related professions is imperative and does influence the decisions made by stakeholders within these professions. The radiography profession is no different in its aim and functions within a multidisciplinary team and its performance is crucial for optimum service delivery. It is important for members of the radiography profession to constantly review their current practices in order to improve the profession and service rendered to patients. Furthermore radiographers need to be adaptive to respond to the current healthcare needs of the population; this requires a change in the radiography scope of practice. This study identified healthcare needs that are similar to those experienced in countries abroad<sup>[9]</sup>. The current day-to-day experiences of radiographers and, possibly other health care professionals within the clinical environment, advocate for radiography role extension.

## Conclusion

Health care needs have dramatically changed in recent years and professions

need to adapt to adequately address these changes. Radiography role extension has proved to provide better service delivery, increase radiography morale and value in the UK. This study highlights the need for radiography role extension into image interpretation at PHC level in South Africa. Radiography role extension in South Africa requires closer and urgent attention if patients' needs and optimum service delivery are to be realised. The challenges within the PHC level are the deployment of newly qualified medical officers with limited experience on image interpretation, the absence of radiologists, the failure of the radiography education to prepare radiographers for these challenges and, the legal restriction placed on radiographers that seek to respond to these challenges within the clinical environment. In conclusion a change in the radiography profession should be advocated for, by amongst other things, research. Currently there is no documented evidence that demonstrates the need for South African radiographers to extend their role. Research needs to be conducted to demonstrate the need for radiography role extension in SA. Such research should concentrate on the current image interpretation skills of radiographers. The themes that emerged from this study need to be investigated further to give a clear picture of the challenges experienced by radiographers in PHC level.

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