

## **Kenyan Radiographers' Willingness to Train in Image Interpretation of the Chest and Musculoskeletal Systems**

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### **ABSTRACT:**

**Introduction:** In Kenya there is an acute shortage of radiologists. Most rural and remote hospitals with x-ray departments do not have radiologists to report on plain film radiographs.

Plain film radiographs are sent to national, provincial, referral and academic institutions for radiological reports. The aim of this study was to investigate the willingness of Kenyan radiographers to train in image interpretation of the chest and musculoskeletal systems to supplement radiologists.

**Method:** The study was conducted through a quantitative descriptive cross-sectional survey design. A total of 155 questionnaires were distributed. One hundred and forty-five questionnaires were completed and returned (n=145/155). Data from the returned questionnaires were analysed with the assistance of a statistician using STATA Version 13.

**Results:** One hundred and forty-five questionnaires were completed and returned (n=145/155), with a response rate of (94%). The results from this study indicate that Kenyan radiographers are willing to train in image interpretation of the chest and musculoskeletal systems (99%). The training of radiographers in image interpretation would bridge the gap created by the shortage of radiologists.

**Conclusion:** Based on the findings of this study, Kenyan radiographers are willing to train in image interpretation of the chest and musculoskeletal to supplement the shortage of radiologists. It was the opinion of the participants that the policy on health care needs be changed and structures put in place to enable radiographers in Kenya to train in image interpretation.

**Keywords:** Willingness, Image interpretation

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### **I. INTRODUCTION**

Since the discovery of x-rays by Wilhelm Roentgen in 1895, the field of radiology has faced several challenges. The number of patients has increased and the technology has expanded rapidly. The overwhelming number of patients has overstretched the small number of radiologists available (May, Martino & Mc Elveny, 2008:e24). In Kenya most county, Sub-county and remote hospitals with x-ray departments do not have radiologists to report on plain film radiographs. Plain film radiographs are sent to national, provincial, referral and academic institutions for radiological reporting where radiologists are available. This often results in a delay in the treatment of very sick patients. In an International Society of Radiologists (ISR) conference held in Cape Town in September 2006, Dr. Wanga the then head of the Kenya Society of Radiologists was quoted saying that there was a great shortage of radiologists in the country. He said that there were only 80 radiologists serving a population of 32 million people in 2006 (Williams, 2006:15).

By the year 2008, Kenya had only 248 radiologists and radiologist-patient ratio was 1:400,000 people (Andronikou, Hugh, Abdurahman, Khoury, Mngomezulu, Brant, Cowan, Culloch & Ford, 2010:2081-8). This situation has not changed proportionally with the increase of the Kenyan population. The Kenyan population in 2010 was 40 million, according to the then minister for planning Mr. Wycliffe Oparanya (<http://.nation.co.ke/news>, Tue 08/31/2010). According to the Kenya government's strategic plan of vision 2030, it is set to provide equitable and affordable health care to all her citizens (Kenya Vision 2030, 2007:12). The provision of radiological services and the shortage of radiologists may impact negatively on this vision. A research study conducted by Mukhwana (2013:4), indicates that in Kenya telehealth (Teleradiology) services are limited and people in remote and rural hospitals may access a general practitioner but residents are forced to travel long distances to seek radiological reports from a few radiologists in cities and cosmopolitans. According

to Kawooya (2012:37), over 80% of the population in South Saharan Africa (SAA) is rural, which is in dire need of rural radiology (RR). The majority of the SAA countries are facing human resource shortages especially radiologists. The shortage will be an impediment in the attainment of the global health goals, particularly in the provision of radiological services, unless a training intervention (the training of radiographers in plain image interpretation and writing of a relevant report) is implemented. In view of these challenges, the limitation of Teleradiology and the shortage of radiologists led some countries to strategically redesign the medical workforce to fill the gap created by the shortage of radiologists by training non-physicians such as radiographers, in order to meet the increasing demand for radiological services.

Following a statement by the Royal College of Radiologists that workload in England for radiologists had increased by 322% between 1968 and 1991, specialized courses were introduced to train radiographers to interpret images. A study conducted indicated that after the training, radiographers' accuracy had improved from 81% to 95% following six months of training. Further research indicated a potential improvement in the emergency department (ED) following the introduction of radiographer image interpretation (Kelly, Rainford, Gray & Mc Entee, 2012:91). Uganda's policy allows non-physician medical personnel (radiographers) to train in image interpretation to supplement radiologists and twenty-five radiographers have been trained in image interpretation to work in rural radiology departments (Kawooya, 2012:37).

The aim of this study was to determine the willingness of Kenyan radiographers to train in image interpretation of plain films of the chest and musculoskeletal systems, to supplement the shortage of radiologists so that all Kenyans can access radiological services as stipulated in the government of Kenya's Vision 2030, which includes the provision of a radiological report. Image interpretation is the evaluation, detection and diagnosis of abnormalities within a human body on a radiograph, computed tomography or magnetic resonance images by highly skilled personnel, radiologists, registered radiographers or nurses.

## II. METHODS

Ethics approval to conduct this study was obtained from the University of Johannesburg (UJ) Higher Degree and Ethics Committee and the National Commission for Science, Technology and Innovation, Nairobi Kenya. To achieve the aim of this study the researcher used a purposive sampling. The study was conducted through a quantitative descriptive cross-sectional survey design. An objective of the study was to elicit the opinion of the participants on the willingness of Kenyan radiographers to train in image interpretation of the chest and musculoskeletal systems to supplement the shortage of radiologists. A self-developed questionnaire based on current literature, was piloted using eleven radiographers to assess the validity of the instrument. Radiographers who participated in the pilot study did not take part in the main study as their participation could compromise the results.

The inclusion criteria for the study were radiographers with a working experience of five years and more, working in the government and private hospitals in Kenya. Radiographers who had worked for less than five years were excluded from the study. Two methods were used to distribute the questionnaires. One method was by self-administration of the questionnaires and another one through mail. A covering letter inviting radiographers to participate in the study was attached to each questionnaire, and by completing the questionnaires it was assumed that the participants had given consent. Sixty-nine questionnaires with self-addressed stamped envelopes were distributed to 12 public and private hospitals. Of the 69 questionnaires, 64 were completed and returned. Twenty-six questionnaires were self-administered to radiographers in training at Ziwa Sub-county hospital. Twenty-four questionnaires were completed and collected by hand by the researcher. Sixty questionnaires were distributed to radiographers in an annual general meeting at the United Kenya Club, 57 were completed and collected by hand by the researcher. In total 155 questionnaires were distributed and 145 (94%) were completed and returned. Data from the returned questionnaires were analysed by the assistance of a Statistician using STATA Version 13. Descriptive statistics such as measures of central tendency and measures of spread were used for continuous data, while frequency listings were used for categorization of variables. Coding and thematic analysis was used for the open-ended questions.

## III. RESULTS

One hundred and forty-five questionnaires were completed and returned (n=145/155) with a response rate of (94%). Ten questionnaires were returned incomplete and were not included in the data analysis. The results from this study indicate that Kenyan radiographers are willing to train in image interpretation of the chest and musculoskeletal systems (99%). According to the participants, training radiographers would bridge the gap created by the shortage of radiologists, by radiographers providing radiological reports (n=145/145; 100%). Participants believed that the training would reduce radiologists' workload (n=144/145; 99.3%). They believed that the training would create time for radiologists to perform more complex examinations (n=144/145; 99.3%). The participants believed that provision of radiological reports by radiographers would reduce patient waiting time (n=123/142; 86.6%). It was the participants' view that if radiographers trained in image

interpretation, radiological services to patients would improve (n=119/142; 83.8%). If radiographers trained in the same, according to participants, radiographs currently returned unreported to clinicians would reduce (n=118/141; 83.7%). The participants thought that accessing a radiologist's opinion during the course of one's daily work could be difficult (n=73/140; 52.1%). The participants were of the view that image interpretation by radiographers should become legal in Kenya (n=115/139; 82.7%). Almost all participants were of the opinion the training would benefit their current departments (n=140/145; 97.2%). The participants (n=105/140; 75%), were of the opinion that radiographers need to train in image interpretation at Master's level to be able to interpret the chest and musculoskeletal systems. The reasons they gave was that the training would reduce patient waiting time, improve patient satisfaction, improve patient management, reduce workload and 'hot' reporting, hence prompt intervention by clinicians.

#### **IV. DISCUSSION**

Based on the findings of this study the majority of radiographers in Kenya are willing to train in image interpretation to alleviate the shortage of radiologists in the country. The shortage of radiologists is supported in research by Williams et al. (2006:15), who argue that according to Dr. Wanga the then head of the Society of Radiologists in Kenya, there were only 80 radiologists serving a population of 32 million people in 2006. Andronikou et al. (2010:2081-8), maintains that in 2008 Kenya had only 248 radiologists. In 2010 according to the then minister for planning Mr. Wycliffe Oparanya (<http://.nation.co.ke/news>, Tue 08/31/2010), Kenyan population had grown to 40 million people and the situation had not changed proportionally with the increase of the Kenyan population. Participants were of the opinion that if radiographers trained in image interpretation and provided radiological reports, patients waiting time would reduce. This implies that if radiographers provided radiological reports after training in image interpretation, the time patients spend in hospitals waiting for reports would reduce as radiographers would perform x-ray examinations and at the same time provide reports. This would facilitate patients' easier access to clinicians and therefore earlier intervention as the time they would spend waiting for a radiologist's report, would be spent with the clinician. Hardy and Snaith (2013:61) concur with the radiographers' opinion and assert that patients who received immediate reporting by radiographers received more appropriate management by doctors.

According to participants, radiological services to patients would improve if radiographers trained in image interpretation. The opinion is concordant with Paterson (2010:8), who maintains that role extension will enhance the quality of service provided to patients. Radiographers also felt that after training, plain film radiographs currently returned unreported to clinicians would reduce. The opinion of the radiographers conforms to that of Paterson et al. (2010:8), who asserts that if radiographers trained in image interpretation many plain films that are returned to clinicians unreported would reduce as 'hot' reporting by radiographers would enable patients to receive timeous treatment. According to a study conducted in England in 2015, about 330,000 patients were waiting for more than one month for radiological reports on their x-rays and 8000 for Computed Tomography (CT) and Magnetic Resonance (MRI) reports across the country (The Royal College of Radiologists, 2014). This links with the fact that in most county and remote hospitals with x-ray departments in Kenya do not have radiologists to provide reports, and training in image interpretation by radiographers would enable easier access by patients to radiological services. Thus according to participants, it is imperative that post basic qualification training in image interpretation be introduced and legalized in Kenya. In England due to the shortage of radiologists, the government had to change the National Health Service (NHS) and the Community Care Act of 1990 which resulted in the blurring of professional boundaries to ease practicing of role extension. The government also changed policy to remove restrictions so that radiographers could provide radiological reports (Brealey, 2005:232-233). In Uganda the country's policy allows non-physicians medical personnel (radiographers) to train in image interpretation and provide reports (Kawooya, 2012:37). For the government of Kenya to realise the global health goals and achieve Vision 2030, the government would need to change policy on health care so that radiographers can train in image interpretation and provide radiological reports.

#### **V. CONCLUSION/RECOMMENDATION**

From the findings of this study it can be concluded that Kenyan radiographers are willing to train in image interpretation of the chest and musculoskeletal systems, due to the acute shortage of radiologists in the country. Therefore in order for all Kenyans to access radiological services especially in the remote and rural hospitals, a training intervention needs to be implemented (training of radiographers in image interpretation). To achieve the global health goals and Vision 2030, the government is encouraged to change the country's policy on health care especially in the radiology sector and put structures in place to train radiographers in image interpretation. Currently there is no institution in Kenya that offers a master's degree in image interpretation of the chest and musculoskeletal or in any other system or modality in radiography. The Society of Radiography could work in collaboration with the University that offers a Bachelor's degree in radiography, to establish a program at Master's level to incorporate image interpretation of the chest and musculoskeletal for radiographers.

## REFERENCES

- [1] Andronikou, Hugh, Abdurahman, Khoury, Mngomezulu, Brant, Cowan, Culloch & Ford (2010). Pediatric radiology seen from Africa. Part I: providing diagnostic imaging to a young population. *Pediatric radiology* 10, 2081-8.
- [2] Brealey, Scally, Hahn, Thomas, Godfrey & Coomarasamy (2005). *Clinical radiology* 60, 232-241.
- [3] Hardy & Snaith (2013). Radiographer reporting good for patients and you. *Radiography*, January 25, 2013, issue 61.
- [4] Kawooya, M.G. (2012). Training for rural radiology and imaging in Sub-Saharan Africa: Addressing the mismatch between services and population. *Clinical imaging science* 2, 37.
- [5] Kelly, Rainford, Gray & Mc Entee (2012). Collaboration between radiological (radiographers) and junior doctors during image interpretation improves the accuracy of diagnostic decisions. *Radiography* 18, 90-95.
- [6] Kenya Vision 2030 (August, 2007:12). Accessed on 30<sup>th</sup> July 15.
- [7] May, Martino & Mc Elveny, (2008). The establishment of Advanced Clinical role for radiographers in the United States. *Radiography* 14, e24.
- [8] Mukhwana, A.B. (2008). Challenges facing implementation of Telehealth projects in Kenya. A Master's thesis: Kenyatta University.
- [9] Paterson A. (2010). Medical image interpretation by radiographers definitive guidance. *Radiography*, 207 Province Square Mill Street London SE 1 2 EW.
- [10] The Royal College of Radiologists (2014). *Clinical Radiology*. <http://www.nhs.uk/servicedirectories/pages/acutetrustlisting.aspx>
- [11] Williams (2006). Professional role extension for radiographers. *The South African Radiographer* 44, (2), 15.
- [12] Wycliffe Oparanya, then Minister for planning (2010). Kenyan population. <http://nation.co.ke/news,Tue 08/31/2010>.

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