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Research Article

A Survey of Clinicians' Preference, Opinion and Satisfaction with Radiological Reports at Kenyatta National Hospital

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Keywords

- Radiology; Structured reports; Conventional reports; Itemized reports; Preference

Abstract

Background: The radiology report is a crucial tool to communicate the radiological examination findings to the referring clinicians. There is no universally agreed structure or style of radiological report, and each radiologist and the referring clinician potentially has their own preferred structure and content of the same. At Kenyatta National Hospital (KNH) all reports are written and typed by the radiologist and verbal communication of radiological findings are made to the referring clinicians on critical results. There is no Radiology Information System/ Picture Archiving and Communication (RIS/PACS). The radiologists have to grapple with improving the turnaround time (TAT) and clinician's satisfaction with the reports. KNH is a tertiary referral and teaching hospital with referring clinicians ranging from consultants in different specialties, residents, medical officers and interns.

Objective: The main objective of this study was to evaluate the clinicians' satisfaction, preference and opinion concerning the radiology reports within Kenyatta National Hospital.

Materials and methods: A total of 400 eligible referring clinicians (consultants and registrars) were contacted via text message between the months of June and July, 2018 and requested to fill a 6-part semi-structured online questionnaire concerning radiology reports. Part A of the questionnaire asked about demographics of the respondents, while parts B, C and D assessed the confidence of the referring clinicians in the reports, content, style, language and delivery of the radiology reports they received, respectively using 5-point Likert scale. The clinicians ranked 4 reports of varying content and style concerning a hypothetical patient in part E of the questionnaire. The clinicians were also requested to give reason(s) for the ranking and give any additional comment they had concerning radiology reports.

Results: A response rate of 28.25 % (113) was reported. 59.29% (67) of the respondents were male and 40.70% (46) female. The response rate for registrars was 82.3% (93) and for consultants 17.7% (20). Median length of general practitioners' work experience was 3.5 years, because most doctors work first as general practitioners before doing a specialty, while that of a specialist was 8.9 years.

While detailed itemized report written under subheadings for each organ/system is preferred by 79.4% (n=90) of the clinicians. A detailed itemized radiology report is more popular with the clinicians (55.1%, n=62) than a summarized itemized report (24.3%, n=28). 84% of the clinicians (n=95) ranked a format that did not give details of the findings but only summarized the findings as their least preferred.

Conclusion: Clinicians at our hospital value the radiology report in the management of patients.

However, challenges of not having electronic reporting system, means reports are delivered manually hence delay. There are challenges of relaying critical results to referrers who may have not left their telephone contact. Also, with manual requisitions there are challenges of delivering the report within the shortest possible time.

Referring clinicians preferred structured reporting as opposed to conventional prose reporting.

INTRODUCTION

The written radiology report is a formal communication of the patient's findings from performed radiologic examination and is a medicolegal document [1,2]. It is also the channel of communication between the radiologist and the referring clinician regarding the patient's findings. There is no universally agreed structure or style of radiological report, and each radiologist and the referring clinician potentially has their own preferred structure and content of the same. In departments where there is RIS/PACS studies have shown reduction in face to face interaction between the radiologist and the referring clinician, hence the report needs to be more explicit [3]. Although RIS/PACS reduce physical interaction between the radiologist and the referring clinician [4], other avenues of communication of critical findings are still available like telephone call to relay these findings. In our case because we do not have RIS/PACS, interaction between the radiologist and the clinicians is through multidisciplinary meetings but these meetings and discussions do not replace the radiology report. In fact, lack of RIS/PACS means that the written radiology report is even more critical, hence the current study. Therefore, in the era of personalized medicine, the radiology report has to be unambiguous and timely [5].

Clinician's and radiologists may have differing opinion on the structure and content of the radiology report. Some prefer free

flow texts, while others prefer structured radiology reports. The level of details and the style, language and lexicon preferred by each has also been shown to vary [6-8].

The issue is global, the opinion and expectation of clinicians concerning radiological reports vary depending on the geographical region [9,10]

This study sought to assess the clinicians' satisfaction, preference and opinion on the radiology reports that they review.

MATERIALS AND METHODS

Study Design

This was a cross-sectional study that utilized self-administered surveys to evaluate preference of the radiological report among clinicians.

Data from this study was collected between June 2018 and July 2018. Permission to conduct the survey was obtained from the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee

Study Area Description

Kenyatta National Hospital (KNH) is the largest referral hospital in Kenya, and serves as one of the teaching hospitals for University of Nairobi college of health sciences inclusive of graduate training of radiologists. The hospital has a robust radiology department performing an average of 9000 radiological examinations per month. This includes MRI, CT scan, ultrasonography, conventional radiography, fluoroscopy, mammography and interventional radiology. The department runs 24 hours and serves the accident and emergency department, inpatients and outpatient clinics. There are 24 radiologists in the department.

Study Population

This included post graduate students as well as specialists in the various disciplines of medicine and surgery, namely internal medicine, surgery, ophthalmology, obstetrics and gynecology, anesthesia, and pediatric and child health.

Procedure

The clinicians were contacted via text message between the months of June and July, 2018 and requested to fill a 6-part semi-structured online questionnaire concerning radiology reports. Part A of the questionnaire asked about demographics of the respondents, while parts B, C and D assessed the confidence of the referring clinicians in the reports, content, style, language and delivery of the radiology reports they received, respectively using 5-point Likert scale.

Data collection

Four hundred eligible clinicians from the departments of internal medicine, surgery, ophthalmology, obstetrics and gynecology, anesthesia, and pediatric and child health were invited to participate in the online survey via phone text message to the clinicians' phone number provided in clinical duty roster available in the respective departments. The message sent bore a link to the questionnaire prepared in Google Forms® (Alphabet Inc, Mountain View, California, United States) and had the letters of approval by the institutional review board attached. To prevent multiple submissions from the same respondent, login in was mandatory and the link to resubmission and sharing was disabled. The survey was done in the month of June and July, 2018. A six-part questionnaire concerning radiological reports was prepared and pretested among a small group of clinicians who were eligible to take part in the survey in order to ensure the questions could be understood in a straightforward manner, were unambiguous and that they were presented in a logical sequence. These responses were not used in the main study during analysis.

RESULTS

A total of 113 (28.25 %) of the eligible clinicians responded in the survey. 59.29% (67) of the respondents were male and 40.70% (46) female. Registrars comprised 82.3% (93) of the respondents while the consultants were 17.7% (20). The mean number of years of experience in the medical field was 8.9 years for the consultants or specialists.

Majority of the respondents (n=58, 52.3%) request an average of 10-20 radiological examinations per week, with 33.6 % (38) of the respondents requesting less than 10 examinations per week. The most commonly requested imaging studies ranked as Ultrasonography (48.7%) and computed tomography (45.1%). The least requested for study was Magnetic resonance imaging at 0.9%.

95.5% (107) of the clinicians either write detailed clinical information (n=39; 35.1%) or write clinical information in a few words (n=67; 60.4%) on the radiology examination request form. 4.5% of the respondents stated they want to write clinical information on the request form but the large patient load leaves them with insufficient time to write. None of the respondents think it is unnecessary to write clinical information on the radiology report. 38.9 % (44) of the respondents either strongly disagreed or disagreed with the statement that disclosing the medical condition of the patient by writing a clinical summary often biases the radiologist. 92.9% (104) of clinicians agree that for a radiologist to make a good report, he/she needs to know the clinical question (e.g cough for 3 weeks r/o pulmonary tuberculosis.) To better interpret the images, 61.6% (69) and 34.8% (39) of the clinicians strongly agree and agree, respectively with the statement that the radiologist needs to know the medical condition of the patient. (e.g. patient with retroviral disease and low CD4 count, complaining of non-productive cough and difficult in breathing.)

71.7%(84) of the responds either strongly disagreed or disagreed that they receive verbal communication from the radiologist on critical and urgent findings (where emergency action is required as soon as possible or medical evaluation is required within 24 hours, respectively) (Figure 1).

81.4% (92) of the clinicians disagreed that they get verbal communication from the radiologists where there are significant, important, unexpected findings in a radiological examination such a lung mass seen in a chest radiograph requested as part of pre-operative assessment for a scheduled elective procedure in another part of the body.

82.2% (94) of the clinicians read the radiology report as soon as it is available, despite there being delays in the delivery of reports. 77.8% (88) of the clinicians believe the reports are sufficient in answering the clinical question/are valuable in the management of the patients (Figure 2). 74.3% (84) indicated that important information is usually included, information that the clinician might not have noticed themselves on the images.

22.9% (n=27) of the clinicians indicated that information vital to the management of patient's condition is not mentioned in the reports and 18.8% (n=21) consider themselves better able to interpret radiologic images in their own clinical specialties/ subspecialties.

In terms of the structure of the radiology report, 76.6% (85) of the interviewed clinicians prefer an itemized radiology report with the body of the report written under sub-headings for each organ/system. Of these respondents, 69% (59) prefer the findings on each organ system given in detail in prose and not itemized. 85.6% (95) of the respondents' least preferred format was one that only stated the conclusion of the radiologic investigation finding without providing any further detail.

50.9% (57) of clinicians want the pathologic lesions to be described first in the order of significance, at the beginning of the results section of the radiology report while 49.1% (55) of the clinicians prefer the pathologic lesions be indicated at the related parts in a standard format of a radiology report but be emphasized by bold or italic font.

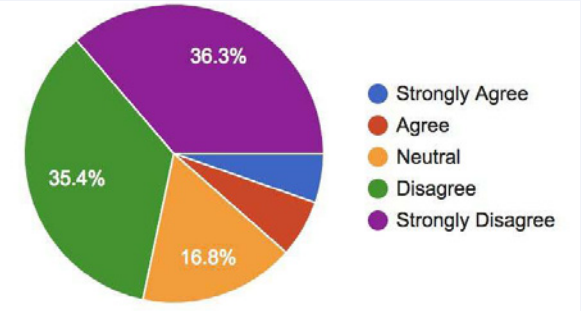

Figure 1 Verbal communication from the radiologist on critical and urgent findings. Do the radiologists communicate to the clinicians?

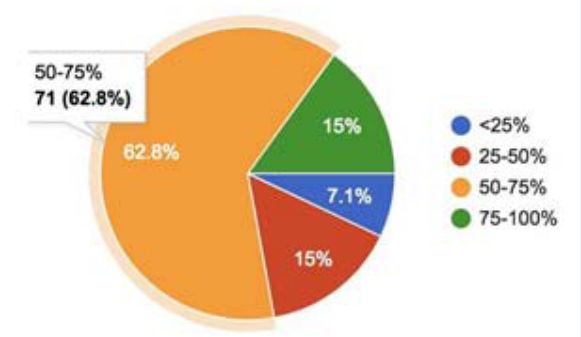

Figure 2 Sufficiency of radiology reports. What percentage of radiology reports are sufficient (ie answer the clinical question/are valuable in the management of the patient's condition)?

48.2% (54) of clinicians find it easier to understand radiology reports with disease specific structure as opposed anatomy-based structure when there are complex pathologies involved. 22.4% (25) of the clinicians prefer anatomy-based structure. 29.5% (33) of the clinicians did not express preference for either of the two formats.

Majority of the clinicians (83%, n= 93) find it easier to understand radiology reports that have simple language and style. 58.4% (66) think it is necessary to use radiologic terms (eg T1W hypointense, T2W hyperintense etc) in the radiology report. On the other hand, 30.1% (34) think it is sufficient to indicate what the lesion is or likely to be (e.g Simple cyst, hemorrhagic cyst, abscess etc). Only 11.5% (13) find it adequate to only mention the location and features of the lesion.

Where standard lexicon/language is available (eg. BI-RADS {breast lesions}, LI-RADS {liver imaging}, HI-RADS {Head injury imaging} etc), 61.1% (69) of the clinicians would prefer the radiologist use the lexicon. 23.9% (27) of the responds do not prefer the standard lexicon.

Regarding content of radiology reports, most clinicians state that the radiology report should bear details of the radiologic examination technique, challenges encountered when performing or interpreting the radiologic examination, a conclusion/ impression, list of differential diagnosis, recommendations for further imaging (if any is required), and suggestions for non-radiological investigation that may narrow down the differential diagnosis where applicable.

Regarding delivery of radiology reports, 53.1% (60) of the clinicians prefer delivery through a hospital radiology system, while 43.3% (50) prefer delivery by the patient or the patient's relatives. 61.9% (70) of the clinicians want both the full set of images delivered in addition to the radiology report. 6.2% (7) prefer only the sets bearing images with pathology printed out. Only 0.9% (1) of the clinicians think it is unnecessary to print images if the radiology report is well written.

Most clinicians prefer the radiologist to not discuss the details of the findings in the radiological exam with the patient, either because this would put the clinician in a difficult position if the clinician's position differs with that of the radiologist (27.7%, 31) or because the clinician has greater interaction with the patient and therefore likely knows the patient condition better than the radiologist (17%, n=19) or because of both reasons above (36.6%, n=41). Only 18.8% (21) think the radiologist is in a better position to discuss the details of the findings of radiological examination with the patient. (Figure 3).

DISCUSSION

Majority (77.8%, n=88) of the clinicians read the written radiology report as soon as it is available and are satisfied with radiology reports. This compares favorably with a multicenter Belgian study that found satisfaction of the clinicians with the radiology reports at 71.8% [6] . The clinicians consider the radiologist better placed to interpret radiology images. Bearing this in mind, radiologist should double their effort in communicating effectively and in a timely manner with the referring clinicians to enhance patient care. The high percentage

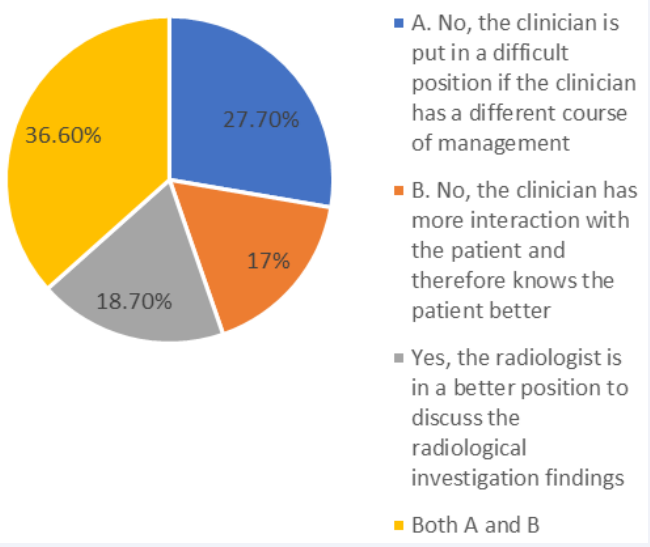

Figure 3 Discussion of the details of the findings in radiological examination with the patient. Should the radiologist discuss with the patient?

of clinicians who reported that they write clinical information in radiology request forms is higher than the findings in prospective study done by Dharsee et al., at Kenyatta National Hospital in 2000 who found only 53.8% of the request forms had clinical information and that in general, 68% of the request forms were inadequately filled.

Three quarters of the clinicians prefer itemized radiology reports. Structured reports are easier to read and interpret and have been shown to be more effective in patient management. Clinicians' recall of details in structured reports is significantly better compared to the recall in prose reports [11,12]. In addition, structured report templates may be used as a checklist while the radiologist is reviewing the case, and it has been shown to be ideal for data mining. The use of structured reports has been shown to increase efficiency of extraction of information that contributes to better clinical decision by the clinicians [13,14]. In patients with multiple sclerosis, the use of structured reports has been shown to provide more information relevant to the clinical care of the patients than the information provided by non-structured reports or free flow text reports [15]. Similar findings have been reported in the use of structured reports for evaluation of rectal cancer [16].

There is a significant difference in the number of clinicians who want inclusion of recommendations for further imaging, non-radiologic investigations and clinical guidance in the radiology report (95.6% n=108, 86.7% n=98, 50.4% n=57 respectively). This is not unique to this study. Inclusion of recommendations in enhanced radiology reports has been shown to be preferred by clinicians and to improve clinical decisions [17]. However, nearly a third of radiology report follow-up recommendations are not executed [18].

Use of standard lexicon where available (eg. BI-RADS, PI-RADS, HI-RADS, LI-RADS) is preferred by a majority of the clinicians. These findings are similar to results in the studies by Spilseth et al and Bosmans et al [7, 6]. The dislike of the lexicon by a minority of clinicians has been attributed mainly to inexperience and failure to understand the lexicon.

Majority of the interviewed clinicians would prefer the radiologist not discuss the radiology findings with the patient. The clinicians feel this would put them in an awkward position with the patients should they hold a different opinion from that of the radiologist and that their greater interaction with the patient gives them an edge in knowing the patient better. These sentiments are in direct conflict with the principle of patient autonomy [19]. Indeed, most patients would like to know the findings of their examinations from the radiologist before getting an appointment with the clinician [20]. However, this patient preference seems to diminish the more complex or ominous the diagnosis is. In addition, there are increasing cases of patient self-referral for diagnostic imaging [21]. These patients would inevitably have to discuss the results of their tests with the radiologist, especially positive results that would require the attention of a clinician.

Timely communication of urgent and significant unexpected radiology findings to the referring clinicians in our center is not optimal where only 11.5% (13) and 9.7% (11) of the clinicians receive such communication from the radiologists respectively. This may be occasioned by a lack of clinician contacts in the referral form to facilitate communication of these results. The American College of Radiology Practice Guidelines for Communication of Diagnostic Imaging Findings emphasize timely reporting of critical test results and recommend documentation directly in the radiology report [22].

Similarly the NHS National Patient Safety Agency advises that radiology reports should ensure that critical findings are emphasized and obvious and that the degree of urgency for action by the referring clinician is clear [23].

CONCLUSION

Clinicians are generally satisfied with the written radiology reports they receive and value them. However, nearly a quarter of the clinicians are unsatisfied and a minority feels better able to interpret images of their own sub-specialties than the radiologist.

Most clinicians prefer detailed and itemized radiology reports as opposed to reports written in prose. The clinicians prefer reports detailing the patient's demographics, clinical information, examination technique, the findings, a conclusion, the radiologist's impression and differential diagnosis where applicable.

In addition, most clinicians prefer the radiologists recommend any further radiologic investigation or any non-radiologic investigation that may help narrow down the differential diagnosis.

The clinicians find it easier to understand reports written in simple language and style. Where applicable, the clinicians would prefer the radiologist use standard lexicon (eg. BIRADS, LIRADS, PIRADS).

LIMITATIONS OF THE STUDY

The self-reporting and low response rate of 28.25 %, although higher than other similar studies, has an inherent risk of non-response bias which means that the views expressed by the responders may not necessarily be similar to the views of the non-responders.

This is not a multicenter study hence findings may not be generalizable to the whole country or to all clinicians.

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