PACIFIC JOURNAL OF MEDICAL SCIENCES
{Formerly: Medical Sciences Bulletin}
ISSN: 2072 – 1625

Pac. J. Med. Sci. (PJMS)

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# ASSESSMENT ON THE EFFECTIVENESS OF COMMUNICATION BETWEEN RADIOGRAPHERS AND PATIENTS DURING GENERAL RADIOGRAPHIC EXAMINATIONS AT PORT MORESBY GENERAL HOSPITAL, PAPUA NEW GUINEA

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*Submitted: April 2021; Accepted: July 2021*

# ASSESSMENT ON THE EFFECTIVENESS OF COMMUNICATION BETWEEN RADIOGRAPHERS AND PATIENTS DURING GENERAL RADIOGRAPHIC EXAMINATIONS AT PORT MORESBY GENERAL HOSPITAL, PAPUA NEW GUINEA

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*Submitted: April 2021; Accepted: July 2021*

**ABSTRACT**:
Patient communication is highly regarded as one of the basis of health care and an important part of practice in the application of radiographic procedures. Good communication is necessary in medical imaging if optimum diagnostic images are to be achieved. This study is a prospective assessment on the effectiveness of communication among radiographers and patients during general radiographic procedures at the Port Moresby General Hospital (PMGH). Questionnaires were administered to 100 patients and 15 radiographers using a quantitative approach for data collection. Informed consent was obtained from each of the participants, after obtaining ethical clearance from the authorities. The responses in the questionnaires were recorded in Excel Spread sheet. The data was statistically analysed using Microsoft Excel 2013. A majority (78%) of the patients reported that there were no communication problems while more than half (57%) expressed satisfaction with the radiographic services that were provided. A majority (67%) of radiographers reported that language barrier was the cause of communication problems during radiographic procedures. The result indicated that although there was communication between radiographers and patients, the most common factor affecting effective communication was language barrier.

**Keywords**: radiographer, multicultural communication, patient centric communication, non-verbal communication, radiation protection, Papua New Guinea

## INTRODUCTION:

Communication is rapidly changing, not static, may be verbal or non-verbal, culturally based and dynamic [1]. Interpersonal communication between a radiographer and a patient plays an important role in the success of radiographic examinations. In many countries, an important challenge to health care is the provision of services to a population that is culturally diverse and speaks a lot of different languages [2-3]. Radiographers are trained health professionals in the field of radiology [4]. They provide health care services to a very diverse population like Papua New Guinea (PNG), with

about 700 different languages. Being a competent communicator requires flexibility in understanding what approach is more likely to work best in a particular situation. This is one of the skills radiographers have to master to be competent communicators in the health care team to provide caring services and to meet the needs of a diverse society in PNG while producing high quality images during general radiographic examinations.

**Multicultural Communication:**

Translating patient education in a health care setting where many cultures are identified refers to multicultural communication [2]. Patient communication in a diverse and multicultural country like PNG can be challenging. There are approximately 715 indigenous languages spoken in PNG, many of them unrelated [5], making it the most linguistically diverse place on earth. The centralization of patients in the nation's capital, Port Moresby, from all around the country is a result of rural-to-urban migration [6]. People tend to move to urban areas just to have access to basic services like health care, bringing complex language and cultural background in the hospital setting [2]. Radiographers in PNG provide patient care to a very diverse population made up of different tribes speaking different languages thus making communication difficult. In an effort to achieve the best possible outcome on a radiograph for an accurate diagnosis, radiographers must consider applying the skills of effective patient communication [1, 4, 7-8]. Language and communication style may vary again when conversing with different people of different educational levels, race, age groups, gender and places [1-2]. It is often helpful to put oneself in the patients place and adapt communication to the needs, expectations and abilities of the patient.

**Non-verbal Communication:**

Verbal communication alone is often ineffective and requires the radiographer to be skilled and communicate using non-verbal communication. Non-verbal communication involves the use of facial expression, body language, posture, gestures, eye contact and touch to deliver a message [7-8]. The human face is extremely expressive, able to convey countless emotions without saying a word. Unlike some forms of non-verbal communication, facial expressions are universal. However, the facial expressions for happiness, sadness, anger, surprise, fear, and disgust may vary across cultures [8]. When using body movements and posture, a radiographer must consider how their perceptions of patients are affected by the way they sit, walk, stand up, or hold their head. When a person waves, points, pleads, and often use their hands when arguing or speaking in an animated way, they are using gestures. However, the meaning of gestures can vary

across cultures and regions, so it is important to be careful to avoid misinterpretation [8]. Since the visual sense is dominant for most people, eye contact is an especially important type of non-verbal communication. The way a person looks at someone can communicate many things, including interest, affection, hostility, or attraction. Eye contact could mean sign of positive regard and respect in most of the western countries where as decades ago in some parts of Nigeria, direct eye contact might be regarded as disrespectful to an older person or passing a romantic/flirting message to an opposite sex [8]. Eye contact is also important in maintaining the flow of conversation and for assessing another person's response. People communicate a great deal through touch. A health care professional can gain a patients trust with a firm handshake, a timid tap on the shoulder, a reassuring pat on the back, a patronizing pat on the head, or a controlling grip on the arm. Radiographers in Ghana applied other methods such as touch, hand gestures and sign language to overcome language barriers [2]. Effective communication with the patient demonstrates that the radiographer has an interest in the patient, his or her circumstances and specific needs for care [2, 4, 8].

**Patient Centric Communication:**

Patient centric communication is interaction centred on the patient with a hope to achieve the best possible imaging outcome for the patient [9]. When patients are more involved in their care, they are better able to manage complex chronic conditions by understanding and incorporating their plan of care, are more likely to feel comfortable communicating their concerns and seeking appropriate assistance, have reduced anxiety and stress, and have shorter lengths of stay in a hospital [9]. Staff shortages may be a distraction from patient centric communication [4]. The shortage of staff decreases the time spent between health care professionals and patients. According to the World Health Organization (WHO), there is a shortage of approximately 3 to 4 million health workers worldwide; with the result that time is an increasingly scarce resource in the workplace [10]. This can hinder patient centric communication between health professionals and patients thus increasing patient's anxiety and stress.

**Effective Communication and Impact on Radiographic Image Quality:**

Communication is intrinsic to human characteristic, everyone communicates, yet not everyone takes time to communicate effectively. Effective communication is a two-way dialogue between patients and provider, or by definition, a two-way road where both speak and are as well listened to without either interrupting, both ask questions for clarity, express opinions and inter-change information,

and both are able to completely grasp and understand what the other means to say [8]. Therefore, it involves the interaction in which each sender performs also as receivers; and vice versa [8]. To produce quality images, radiographers must apply three major interrelated categories of radiographic quality which include; film factors, geometric factors and subject factors [11]. Of these three categories, subject factor involves radiographer to patient interaction before and during radiologic examinations. Movement during the examination can produce a loss in radiographic quality called 'motion blur' which may result in repeated radiographs [11]. A radiographer can reduce motion blur by carefully giving instructions to patients as follows: "Take a deep breath and hold it" or "Don't move." It is important to bear in mind that the grammar and vocabulary chosen to express an idea, together with pitch, volume, rhythm used to deliver it, all affect how the message is received and understood [1]. Effective communication is all about working with the patient to achieve the goals that the radiographer and patient both agree on for the patient's well-being [1].

**Patient Communication and Impact on Radiation Protection:**

Patient communication and interaction is also an effective method of radiation protection in a radiology department from the large amount of man-made radiation produced by these sophisticated equipment [12]. Patient preparation before a radiographic procedure is another important part in clinical practice where the use of proper radiographer to patient communication is vital for the reduction of total patient radiation dose. To avoid any artefacts on a resultant radiograph and possible retakes, a radiographer must verbally ask the patient to remove any unwanted artefacts. Out of seven ways of reducing patient exposure to radiation, minimum repeat exposures can be achieved by means of proper patient communication [12]. Proper patient communication during patient preparation can account for a reduction in the examination time and the total amount of radiation dosage that is administered to the patient. Patients overexposed to ionizing radiation are at risk of developing radiation related diseases and may pay a higher fee because of a repeat exposure in a private hospital setting [4]. A repeat exposure may be performed to achieve an acceptable image; however, there would be an increase in the radiation dosage to the patient which according to an ethical stand point, is not 'As Low As Reasonably Achievable' (ALARA) and is contradictory to the ALARA principle [13]. Communicating clear instructions to the patient can encourage understanding and cooperation. Patient communication is highly regarded as the basis of health care and an important part of practice in the application of radiographic procedures. It is however a neglected area of

research in medical imaging in PNG, despite the necessity for good communication if optimum diagnostic images are to be achieved.

PNG is a developing country with a growing population of over seven million [14-15]. There are twenty-two different provinces and the National Capital District (NCD) in four administrative regions. The rural areas of PNG comprise a higher population of 87.5% whilst only 12.5% of the populations live in urban areas and about 31 million people in the capital Port Moresby [14-15].

**Research Rationale and Aim of Study:**

Patients tend to be kept in suspense and are traumatized by the radiographic examinations they go through because of the lack of proper communication [16]. Many factors may affect radiographer and patient communication and thus can prevent the examination from been performed or account for a repeat exposure. These factors include the overload of patients, educational levels of patients, failure of greeting and introduction between radiographer and patient, improper procedure explanation, language barrier and a low voice projection [4]. In cases where there is poor radiographer to patient communication before, during and after the examination, the patients may be uncooperative or may not know what to expect or what to do during the examination. This will affect the outcome of the examination in terms of image quality and the amount of radiation dosage administered to patients [4, 13]. Developing good oral communication takes time, practice and constructive evaluation and feedback from patients, colleagues and departmental heads [4]. There are no published studies on the effectiveness of communication between radiographers and patients and its impact on general radiographic examinations in PNG.

The major objective of this study was to prospectively assess the effectiveness of communication between radiographers and patients during general radiographic examinations at the PMGH.

**METHODOLOGY:**

This was a prospective hospital based cross-sectional study conducted at the PMGH Radiology Department [17-18]. The PMGH is the major public general, specialist and reference hospital in the National Capital District (NCD) and PNG [19]. It is also the teaching hospital for the School of Medicine and Health Sciences (SMHS), University of Papua New Guinea (UPNG). The patients represented a cross-section of the NCD and the Central Province population [19].

Patients that presented for radiographic examinations at the PMGH for the first time during the study period were eligible for enrolment in the study. Thus, convenience sampling strategy was used for the selection of the patients. Since the number of

radiographers present during the study period was very small, convenience sampling technique was also used [4]. The sample size was 110 patients and 15 radiographers that participated in the study.

Pre-tested questionnaires comprising close-ended questions were administered to the selected patients and radiographers using a quantitative approach for data collection [17-18]. The questionnaire contains five sections. The demography of the patient; information collected included gender, date of birth, age of patients and educational levels. In the other four sections variables collected included the factors that affected radiographer to patient communication, such as, failure of greeting and introduction between radiographer and patient, improper procedure explanation, language barriers, staff shortages and influx of patient, if there was a communication problem and patient satisfaction after the examination [4]. The data were recorded in Microsoft (MS) Excel Spreadsheets and analysed statistically using Excel Data Pack version 2013.

**Exclusion criteria**:

Patients who suffered from traumatic injuries, shortness of breath and those that spoke other native languages apart from Pidgin and English were excluded from this study. Paediatrics patients, patients whose age ranged below 18 years and geriatrics patients whose age ranged above 60 years were also excluded from the study.

Ethical approval for this study was granted by the School of Medicine and Health Science Research and Ethics Committee (SMHS REC). Written consent was granted by the Director of Medical Service at PMGH with the approval from the Head of Radiology Department. Participation in both the patient and radiographer survey was entirely voluntary.

**RESULTS:**

Of the 110 patients selected to participate in this study 10 were excluded because of the exclusion criteria. Thus, 100 patients were found suitable to participate in the present study. The mean age for all patients was 35 years and the age range was 18 to 60 years. For the educational levels of the 100 patients, 11% never had a formal education, 29% finished at primary school, 33% dropped out of secondary school and 27% completed studies at the tertiary level.

**Patients' response before the radiographic examination:**

Table 1 shows the percentage distribution of patients' responses to questions related to knowledge before the radiographic examination. The majority (81%) of the patients responded "No" when asked whether they had any knowledge on the imaging modality used and its biological effects. More than half (51%)

of the patients responded "No" when asked whether it was their first time to have an x-ray. A total of 51% of the patients responded "No" when asked whether they were nervous of what will happen during the radiographic examination.

**Patients' response after the radiographic examination:**

Table 2 shows the percentage distribution of patients' responses to questions related to communication and expectations after the radiographic examination. A total of 51% of the patients responded "Yes" when asked whether the staff explained the procedure and greeted them in a well projected voice. The majority (79%) of the patients responded "Yes" when asked whether they understood what to do during the procedure. More than half (59%) of the patients responded "Yes" when asked whether there was enough time allocated for communication. Most (78%) of the patients responded "No" when asked whether there was a communication problem.

**Patient satisfaction with radiology services:**

The result in Table 3 shows the patients' satisfaction with the services provided at PMGH radiology department. In response to the question, 36% "Strongly agree" that they were satisfied and happy with the service that was provided while 57% said that they "Agree".

**Radiographers' responses:**

When asked whether they explained the procedure to the patients before the examination, 93% of the radiographers responded "Yes". In response to the second question 87% said "Yes" that they probed for feedback to ensure that the patients understood the procedure. When asked whether they informed the patient when the procedure was commencing, 93% of the radiographers' responded "Yes". The other results are presented in Table 4.

**DISCUSSION**:

In the present study the response rate was 90.9%. The questionnaires of 100 of the 110 patients selected were completed and found suitable for analysis, because of strict implementation of the exclusion criteria.

**Patients' response before the radiographic examination:**

In the present study, 81% of the patients reported that they had no knowledge of the radiographic equipment that was used to examine them including its biological effects. This indicated low level of anxiety before the examination.

**Table 1: Percentage (n) distribution of the responses of the patients before the radiographic examination.**

| | Yes % (n) | No % (n) |
|---|---|---|
| Do you have any knowledge on the imaging modality used and its biological effects? | 19 (19) | 81 (81) |
| Is this your first time to have an x-ray? | 49 (49) | 51 (51) |
| Are you nervous of what will happen during the exam? | 49 (49) | 51 (51) |

**Table 2: Percentage (n) distribution of the responses of the patients after the radiographic examination.**

| | Yes % (n) | No % (n) |
|---|---|---|
| Did the staff explain the procedure and greet you in a well projected voice? | 51 (51) | 49 (49) |
| Did you understand what to do during the procedure? | 79 (79) | 21 (21) |
| Was there enough time allocated for communication? | 59 (59) | 41 (41) |
| Was there a communication problem? | 22 (22) | 78 (78) |

**Table 3: Percentage (n) showing patient's satisfaction with the services provided at PMGH radiology department.**

| | Strongly agree % (n) | Agree % (n) | Disagree % (n) | Strongly disagree % (n) |
|---|---|---|---|---|
| Patient was satisfied and happy with the service that was provided | 36 (36) | 57 (57) | 3 (3) | 4 (4) |

**Table 4: Percentage (n) distribution of the responses of the radiographers.**

| | Yes % (n) | No % (n) |
|---|---|---|
| Did you explain the procedure to the patients? | 93.3 (14) | 6.7 (1) |
| Did you probed for feedback to establish that the patient understood the procedure? | 86.7 (13) | 13.3 (2) |
| Did you inform the patient when the procedure was commencing? | 93.3 (14) | 6.7 (1) |
| Was communication affected by language barriers? | 66.7 (10) | 33.3 (5) |
| Did you use methods such as touch, hand gestures and sign language to overcome language barriers? | 73.3 (11) | 26.7 (4) |
| Did you give information to the patient pertaining where to go after the procedure to collect results? | 100 (15) | 0 |
| Was communication affected by the shortage of staff and influx of patients? | 40.0 (6) | 60.0 (9) |
| Was there a communication problem? | 53.3 (8) | 46.7 (7) |

Low anxiety levels were achieved because most of the patients (51%) indicated that it was not their first time to undergo a general radiographic examination; in addition, the patients were not nervous of what will happen during the examination. This finding was in contrast to a study by Beyer and Diedericks [20] who reported that 13% of the patients in

their study were not told what was expected from them and what the examination entailed. When patients do not receive clear instructions, this can lead to radiographs being repeated resulting in unnecessary radiation exposure of the patients [4, 11-13, 20]. The same study revealed that more than half of the study population (53%) received one or more repeated projection and 12% were not given an explanation for the need for the repeat [20]. The present study however did not ask patients whether any repeated projections were done.

**Patients' response after the radiographic examination:**

In the present study 59% of patients reported after the examination that there was enough time given for communication by the radiographer, the radiographer explained the procedure with a well projected voice (51%) and that they understood what to do (79%) after instructions were given during the procedure. Overall, there was limited communication problem experienced by the patients in the present study. These findings however are in contrast to studies done elsewhere [4, 21-22] that reported high prevalence of communication problems. This difference can be explained by selective hearing or listening to what the patient may choose to listen to [4]. Some patients may be so worried about their illnesses to take notice of the greetings and explanation of radiographic procedure by the radiographer. It could also be that the patients consider this part of the interaction to be of little importance that they hardly noticed it. The other explanation could be that the radiographers were so much in a hurry that minimal attention was given to greetings and other matters of professional conduct resulting in lack of patient-centric communication etiquette [4, 9-10].

**Patient satisfaction with radiology services:**

Patient satisfaction surveys serve as an avenue to assess communication and information transfer between clinicians and patients and can therefore be a patient's medium of expressing dissatisfaction with the provision of information [23]. The present study revealed that a majority (93%) of the patients expressed satisfaction with the radiology services provided. This finding is similar to a study in two major public and private hospitals in Ghana where majority (81.5%) of the study population expressed satisfaction with the overall quality of diagnostic radiology care [23]. The same study revealed that 97% of patients expressed satisfaction with overall quality of diagnostic radiology care in the private hospital. A similar study in Zimbabwe [4] found that 87% of patients in a private hospital were satisfied with the radiology services provided. Another similar study [2] in Ghana revealed that over 50% of patients showed an overall satisfaction with radiology service in the department.

Therefore, results in the present study concur with other studies [2, 4, 23] implying that most of the patients were happy with the information that was provided to them after the examination and only a few expressed dissatisfaction with the radiographer's communication with patients.

**Radiographers' response during the radiographic examination:**

In the present study, 93% of the radiographers reported that they explained the procedure to the patient and probed for feedback (87%) to establish that the patient understood what to do during the procedure. These findings concur with studies done elsewhere [4, 20], reflecting effective communication between radiographer and patient [1-2, 4, 8]. Despite the effective communication between the radiographers and patients in the present study, 67% of the radiographers stated that language barriers were the cause of communication problems at PMGH. This required the radiographers to used non-verbal communication to overcome language barriers [2, 7-8].

Methods such as touch, hand gestures, eye contact and sign language were used to overcome language barriers as demonstrated by 73% of radiographers in the present study. This finding agrees with a study done in Ghana [2]. Ghana and PNG are two culturally diverse countries and therefore require radiographers to learn to interact using multicultural communication methods. This encourages and enhances the cooperation and participation of the patient in the radiographic procedure.

In the present study, 53% of radiographers reported that there was communication problem between radiographers and patients during the radiographic procedure. This response could be confirmed by the notion that radiographers often barked instructions to the patients behind the control panel, especially in the public hospital [4]. Observations during the present study also revealed that radiographers tend to bark information to patients from behind the control panel causing misunderstanding between patient and radiographer. This may result in repeat exposure thus increasing the radiation dosage to patients [4, 11-13, 20]. Out of seven ways of reducing patient exposure to radiation, minimum repeat exposures can be achieved by means of proper patient communication [12].

All the radiographers in the present study stated that they gave information to the patient pertaining where to go after the procedure to collect results.

This increased patient satisfaction (93%). About 40% of the radiographers in the present study reported that staff shortages and the influx of patients had negative impact on effective radiographer to patient communication. This finding agrees with the results by Rugare et al. [4]; in a public hospital

64% of the radiographers stated that staff shortages and the influx of patients were contributory factors in communication problems. Due to global shortage of approximately 3 to 4 million health workers worldwide; the result is that time is an increasingly scarce resource in the workplace [10], impacting on negative communication skills between health worker and patients. Although, there was a low prevalence of staff shortages and influx of patients affecting communication in the present study, the results were not significant to suggest that staff shortages were a common factor affecting communication between radiographers and patients at PMGH.

**CONCLUSION**:

There was relatively good radiographer to patient communication at PMGH according to the results (78%) by acquiring feedback from patients. More than half (57%) of the patients were satisfied with the radiographic services that were provided. A majority (67%) of radiographers reported that language barriers were the cause of communication problems during radiographic procedures. There is however more room for improvement and requires the radiographers at PMGH to develop the skills of multicultural and patient-centric communication in order to improve patient care. This can be achieved through in-house training workshops to equip radiographers with communication and patient interaction skill necessary to carry out a successful radiographic examination and assess patient communication on a regular basis.

**ACKNOWLEDGEMENT:**

The authors would like to thank the radiographers at PMGH for their invaluable contribution in participating in this research study. We also acknowledge the contribution of the patients that participated in this study.

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