

**Project Title.**

**Improving Radiographers' and Patients' Communication in the Cardiac Catheter Laboratory  
(Radiographer's Perspectives).**

Module Code

IPL4060

**Dissertation submitted in partial fulfilment for the degree of  
Master of Professional Studies in Health (Evaluating Interventional Radiography Practice).**

<b>Student Name:</b>	<b>Cabdi Aakhiro</b>
<b>Student Number:</b>	<b>M05001267</b>
<b>Word Count:</b>	<b>15000</b>
<b>Date:</b>	<b>April 2020.</b>

## II. Contents

## Chapters

Title Page	I
Contents	II
Abstract	III
Acknowledgements	IV
Chapter 1: Introduction	1
Chapter 2: Literature Review	2
Chapter 3: Methodology	3
Chapter 4: Project Activity	4
Chapter 5: Project Fundings	5
Chapter 6: Discussions	6
Chapter 7: Conclusions and Recommendations.	7
Chapter 8: Dissemination of Result	8
: References	
: Appendixes	

### III. Abstract

The National Health Services (NHS) radiography workforce is a vital part of the specialist cardiac team, providing rapid access to a range of high-quality and appropriate imaging during a critical period of the care pathway. Effective communication and interaction between cardiac radiographers and patients prior, during, and post-procedure can contribute not only to reducing procedural time but enhances patient care.

This qualitative study aimed to investigate cardiac radiographers' communication, interaction when caring for patients undergoing radiological interventions at the catheterization laboratories. The research is based on individual interviews analysed using a thematic approach. "Communication and interaction between radiographers and patients (radiographer's Perspective)" How we can develop radiographer's and patient's interactions so that communication in the cardiac catheterization laboratory could be improved?

Grounded theory provided an explanatory framework for the topic that was investigated because of its emphasis on the utilization of a variety of data sources that is grounded contexts, Structured interviews with 12 cardiac radiographers were used to understand their communication with patients and the factors that influence it. An open coding approach was used to analyze the data with both NVivo and Microsoft Word Process applications.

Results: Five main themes emerged and were investigated; 1, Interaction, Communication; Barriers and Challenges. 2. Radiobiological Effects; Patients and staffs. 3. Patient Care in Cardiac Radiography and 4. Multidisciplinary and Inter-Professional Meeting and 5. Patient Anxiety and fear-claustrophobic attacks.

Conclusion: The meaningful interaction and communication between cardiac radiographers and patients are dynamic for the care and treatment of patients. The three phases of communication) prior, during and post communication between radiographers and patients will not only empower patient's awareness for the procedure but also encourage them to comply with directives from operators and reassure and comfort patients who are undergoing primary percutaneous coronary angioplasty and angiography. Guidelines and a model for effective communication have been developed, based on the study findings.

**Keywords:** communication barriers/patients' care in radiography, communication, interaction, and ionizing radiation in cardiology.

#### IV. Acknowledgement.

I would like to express my sincere gratitude to my supervisor Dr Gordon Weller M/DProf Framework Leader, School of Health and Education for his extensive support, assistance, and guidance throughout my research project. His inspiration and leadership in the research field empowered me to complete this study.

I am grateful to my supervisor Dr Catherine Kerr for her continuous guidance advice effort and invertible suggestion throughout the research. I feel indebted for her supervisory role and encouragement. I am genuinely believed that her support and supervisory aid contributed to my academic knowledge and capability. It would have been unachievable to execute this research without her supervision and guidance.

My utmost gratitude to Mrs Anita Champaneri Cardiac Radiography Team Leader and Advanced Cardiac Catheterization Laboratory Radiographer. I would like to thank Mrs Anita for helping to carry out my research and for allowing me to undertake this work.

I would also like to acknowledge my honoured radiography team for their contribution and emotional support throughout the study. I am also grateful for their clinical and academic experience which contributed to my research project.

Lastly, I would like to express my sincere appreciation to my wife and children for their unreserved dedication, support, and encouragement for the duration of my research project by providing me with the logistic support and his valuable suggestion to carry out my research successfully.

# Chapter 1: Introduction.

## 1.0 Introduction.

Ionized Radiation, also known as X-rays, was discovered by Wilhelm Roentgen in 1895 who created the first visualization of the human anatomy using rays. It was the discovery of x-rays that developed the modern digital imaging used in many healthcare settings today. This historic discovery has been transformed by distinguished physicians. X-Ray is the most common diagnostic imaging modality performed and the second most used diagnostic test after laboratory analyses. (Panchbhai, 2015).

X-Ray imaging consists of producing images of body tissues, organs, bones, and vessels by exposing a photographic film or other image receptors to X-Ray ionizing radiation. The absorption of X-Ray energy by tissues is dependent on their density. The high density of bones causes higher absorption/attenuation, so the image appears whiter compared to soft tissue where the attenuation is lower, and the resulting image is darker. (Lewis *et al.*, 2003).

Differences between tissues or organs may be enhanced using contrast agents containing elements of a high atomic number, such as iodine. Contrast agents temporarily increase the density of the tissues or the organs in which they distribute and are routinely used in an increasing range of clinical applications. This includes computerized tomography (CT), interventional techniques such as peripheral and coronary angiography, fluoroscopy, and neuroimaging.

There are two sorts of radiographers: diagnostic and therapeutic. Diagnostic radiographers employ a range of different imaging techniques and sophisticated equipment to produce high-quality images of an injury or disease. Diagnostic radiographers will take the images and very often report on them so that the correct treatment can be given. They use a range of techniques including X-rays, Ultrasound, Fluoroscopy (as a biplane and single plane image intensifiers), CT, MRI (magnetic resonance imaging) and Nuclear Medicine (NM). (Briggs-Kamara, Okoye & Omubo-Pepple, 2013).

Therapeutic radiographers play a vital role in the delivery of radiotherapy services. They are the only healthcare professionals (after oncologist doctors) qualified to plan and deliver radiotherapy. They constitute over 50% of the radiotherapy workforce, working with clinical oncologists, medical physicists, and

engineers. Therapeutic radiographers are responsible for the planning and delivery of accurate radiotherapy treatments using a wide range of technical equipment. The accuracy of these is critical to treat the tumour and destroy the diseased tissue while minimising the amount of exposure to surrounding healthy tissue. Their degree licenced training solely in oncology and the care of cancer patients makes them uniquely qualified to undertake this role. (Couto *et al.*, 2020).

Diagnostic radiographers provide essential services every year to millions of people. Without detailed, high-quality images of what is happening inside the body, the diagnosis would be significantly more difficult, treatments would not be as effective, and valuable time may be lost. Effective health and social care services depend on the professional knowledge and expert skill of their practitioners. Radiographers providing this care require the highest levels of professional knowledge and competence and mature confidence in their expertise. Diagnostic Radiographers work mainly within radiology departments in NHS hospitals or private hospitals and clinics (SOR 2010).

The Cardiac Catheter Laboratory (CCL) is one of the above-mentioned specialities and involves multi-professional collaborations. The Cardiac Catheterization Laboratory (CCL) is a growing radiography speciality profession and provides treatment and investigation to many known and unknown cardiac conditions. The profession is patient-centred and a professionally led complex of specialities. Therefore, radiographers in this field have experience with both advanced technological equipment and severely obstructed heart disease patients. Patients come for short-time procedures such as Primary Percutaneous coronary angiography, diagnostic elective coronary angiography as well as Electrophysiology Studies (EPS), atrial ventricular (AF) Ablations, and Pacemakers. Cardiac radiographers interact and communicate more on technology than on patients, but this study will help to put the centre of interactions and communication on patients. (Murphy, 2001).

The research aims to explain the radiographer's experiences in communication in the CCL and their relationship with patients who are admitted to the cardiology department, by looking at the interactions between radiographers and their patients before, during, and after the cardiac catheterization procedures. The overall aim of this study is to improve and develop radiographers and patient interactions and communication. The target audience for this research project was the professionals (radiographers),

institutional organisations (National Health Service), managers of the organisations, the society of radiographers (SOR) as well as academic staff in United Kingdom Universities and colleagues who may be experiencing a similar issue. The significance of this research project is to lead to the development of an effective communication tool that will improve patient care in the cardiology department and potentially impact the identity of radiographers.

The research project will investigate the cardiac radiographer's understanding of caring for their patient and their interactions prior, during, and post-procedure. This will put the focus on radiographers-patient partnership and patient care in interventional cardiac radiography.

## Chapter 2: Literature Review.

### 2.0 Introduction

The Society and College of Radiographers (SCoR) published a research strategy for radiographers and the feasibility of the strategy is over the next five years (2017-2021). This strategy supports the radiographer from novice through to research professorships (*SoR 2017*). The SCoR policy is that all radiographers are required to engage with research and this strategy aims to embed research at all levels of radiography practice and education and to raise the impact and profile of radiography through high-quality research focussed on improving patient care and/or service delivery and expand UK radiography research capacity through the development of skilled and motivated research-active members of the profession. (Reeves, et al. 2004).

A systematic review is a search, selection, and critical appraisal, and synthesis of pertinent research used to extract data to answer a specific question (Parahoo, K. 2006). Whilst the importance of systematically reviewing all pertinent literature is acknowledged, only a selection of literature has been chosen for this literature review that is related to the topic. To plan the search strategy a focused search question was developed using the SPICE model which assists the researcher to formulate a question relating to the qualitative methodologies, which are appropriate for the nature of this review (Gerrish, K. and Lacey, A. 2006). The SPICE model is an acronym that breaks a search question into different aspects and was utilised as shown (*Appendix 1*).

To address research questions and focus on project main question, research terms. queries have been used to include communication between health care professionals generally and their patients. The research literature of general communication between professionals and patients retrieved over 67000 research articles and books using Middlesex University research library search and referencing. I applied a set of only full-text online articles and materials within a ten years specific period from 2010 to 2020. One thousand , three hundred and eighty-six articles related to medicine, and 1901 were involved communication between professionals and their patients. The broader research pieces of literature of general communication repossess of healthcare professionals and patients presented the use of transferrable communication methods used by other healthcare professionals. Communication and cardiac radiography, communication and



patient care in radiography, interactions and communication in radiography and radiography and patient care, and to ensure reliable research literature was retrieved, validated resources from electronic health and social care databases were searched; this is the ‘broad-brush approach’ (Crookes and Davies, 1998).

Databases searched were ‘Ovid MEDLINE’, ‘Cumulative Index to Nursing and Allied Health Literature (CINAHL)’, ‘British Nursing Index’, ‘PsychINFO’ and ‘Science Direct’. They contained an extensive range of abstracts and full-text materials from a comprehensive range of sources relevant to health and social care professionals and therefore not relevant to my topic of investigation directly. I, however, agree there have been useful radiography research materials.

Databases were searched using queries and search terminology that relates to the research questions. including ‘communication and cardiac radiographers’ ‘catheterization radiography’, ‘communication in the cardiac radiography’, ‘Role of cardiac radiographers’, and ‘patient care in radiography’. Keywords were searched separately and where available mapped to subject headings. Limits were applied to retrieve focused and fewer results including research within the last five years. Some keywords recovered thousands of results, therefore the Boolean operator ‘and’ was used to combine keywords and a manageable of articles were displayed. Search tables are provided (*Appendix 2*).

In his published radiography research article of *Establishing a radiography research culture – Are we making progress?* Nightingale (2016) highlighted

*“While some clinical and academic radiography departments are highly researching active, some do little or no research and argue that responsibility for embedding research within our profession ultimately lies with university departments”* (Nightingale, J 2016:pp 125).

Both recent radiography literature and Society and College of Radiography (SCoR) indicated that there is a great need for researchers in the radiography professions, hence why there is a literature scarcity in the profession.

I have also researched other database search engines to maximize retrieved data that could be related to the research subject. The same search method was applied according to appendices table one and refined again using different search terms. However, no research was found that relates to my topic of study. The fact was

that all retrieved pieces of literature were associated with general radiography and not cardiac interventional radiography. This will be a challenge for the execution of this research project. The databases used in the literature review were Medline, Elsevier, Uni Library, ScienceDirect, Ovid, and CINAHL. The data were extracted from those databases using key words of communication and radiographers, communication barriers/patients' care in radiography and Communication, and cardiac radiographers using Boolean operator 'and' "or" (*Please see Appendix 2*).

The research literature process for my project relates to communication and interaction between cardiac interventional radiographers and the patients who are experiencing primary myocardial infarctions (MI) and angioplasty procedures. The theme will be looked at from a cardiac radiographer's perspective. There is a research deficiency in the radiography profession generally and there have been a handful of researches that are related to radiography compared to other healthcare disciplines such as nursing. However, there is one specific study that relates to my topic with radiology nurses working in cardiology. This study entirely covers nurses working in the cardiac catheter laboratory (Lundén, M. Lundgren, S & Lepp, M 2012). The study is conducted outside the United Kingdom. My research will fill the United Kingdom gap and address radiography perspectives of communication in the cardiology department.

On the other hand, I found enough methodology and framework guideline research for radiography. The qualitative methods proposed by Adams, J. (2003), Ng C, K and Whitea (2005), and later Yielder, J and Davis, M (2009) established the foundations of the radiography framework and research methodology and I utilised the proposed research methods.

## **2.1 Research Questions and Aims.**

Little has been said about the professional caregiver's feelings and how they perceive their service. This research will broadly focus on radiographers working in cardiac catheter laboratories. The main question is how can we improve radiographers' and patients' interactions and communications in the cardiac catheter laboratory?.

The question is to explore the underpinning situations and challenges faced by radiographers in the department concerning patient-radiography interactions and communications. How we can develop

radiographer's and patient's interactions so that communication in the cardiac catheterization laboratory could be improved?

How do these interactions take place? Does it happen in the same pattern? How we can improve the radiographer's guidelines and policy in the workplace? How we can advance `communications and most importantly how can the radiographer's communication method be improved?. The overall aim of this study is to improve and develop the radiographers' experience of caring for patients undergoing interventional radiography (IR) in Cardiology. To develop radiographers' and patients' interactions and communications and Radiographers-patient partnership building and reduce patient anxiety in the cardiac catheter laboratory and to help radiographers to interact with their patients prior and post angiography procedures.

## **2.2 Summary.**

My literature review started with the Middlesex University library search tool using search queries and keywords. An enormous result was retrieved, and the publication period was between 1952 to 2020 by default. I refined the literature search by selecting the last ten years' published literature, full-text online studies, and book review materials. The result has been reduced to twelve pieces of literature. However, none of them directly related to my topic and this indicates there is literature scarcity in general in the radiography profession and in particular within the cardiac interventional radiography speciality.

I explained the regulatory research strategy from the Society of Radiography and the researcher deficiency within the Radiography profession. I highlighted my topic of research which is radiographers' communication and interaction in the cardiac catheter laboratory -Radiographers' perspectives. I additionally underlined the radiography research methods proposed by other scholars and how they shaped my research methodology. I also presented insight into my research questions which explains why I am doing this topic? My research topic will show there is a research deficiency within the radiography profession.

## Chapter 3: Methodology.

### 3.0 Introduction.

Given the nature of the research questions, qualitative research utilizing an inductive approach was considered most appropriate. Qualitative research aims to understand human behaviour and reality and seeks to understand the meaning of the experience from the professional's perspective (Ebrahim, S. and Bowling, A. eds. 2005). Using both qualitative and quantitative methods in the same study often creates the strongest findings (Gerrish, K. and Lacey, A. 2006). However, using a quantitative research method was excluded since my project tended to understand the humanistic interactions, feelings, and the reality between professionals and patients in the cardiac catheterization laboratory.

This research evaluated how cardiac radiographers interacted with their patients in the cardiac department and the communication methods they used as professionals. Therefore, the appropriate research approach would be a qualitative research methodology. The qualitative inquiry seeks to explore the viewpoint and position of the insider with the aim being to examine the meanings, perceptions, experiences, and understanding of those involved.

This point bolstered the recommendation for using a more qualitative approach rather than a quantitative methodology for my study as it aimed at addressing the cardiac radiographer's feelings toward their patients. Besides, quantitative research has been described by (Sandelowski, M.J.2008) as less descriptively precise and attentive to context. Miles and Huberman mentioned that this being the case, a quantitative approach may not allow any rich or deep insight into the service user perspectives to surface versus a qualitative approach that takes a more holistic view through individuals' own words and perceptions (Maxwell, J.A., 2008).

In this study, a grounded theory design is useful to understand the what, when, why and how cardiac radiographers interacted and communicated with patients. However, this approach of grounded theory would provide me with an explanatory framework for the topic that I investigated because of its emphasis on the utilization of a variety of data sources that is situated in particular contexts. The grounded theory provides a

natural theoretical fit when designing nursing research studies. (Hussain, Z., Pickering, V., Percy, D., Crane, J. and Bogg, J. 2011).

The qualitative research method provided an analytical tool for the data collected from the research participants and helped in understanding the context of the situations as they evolved, as it would be beneficial for this project to understand the feelings, perceptions, and services provided by cardiac radiographers.

### 3. 1 Sampling.

A total of twelve ( $n=12$ ) Cardiac radiographers participated in the study ( $n=4$  women and  $n=8$  men as seen in *(Table 1 Appendices 3)*). Six of those participants were National Health Service (NHS) full-time contracted professionals and the remaining six participants were Locum (NHS non-contracted) cardiac radiographers. Full-time radiographers tend to work in specified hospitals whereas locum radiographers work in different hospitals with different geographical locations. Below is a chart that highlights the demographic details of the research participants. Figure 1 explains research participants’ social-gender details such as gender, years of experience, and the number of total radiographers. (please see Fig1).

Gender	Number of Participants (n)	Years of Experience
Male	8	Years of Experiences.
		Male
		n-2      ≥20 years
		n-3      10-20 years
		n-2      5-10 years
		n-1      0-5 Years
Female	4	Years of Experiences.
		Female
		n-1      ≥20 years
		n-1      10-20 years
		n-2      0-10 years

Fig 1 Participants’ Socio-Gender Details and Professional Experiences for participants.

The professionals completed a three-year degree and were qualified practising radiographers, All participants had undergone at least a 6-12 months cardiac radiography training program after they become

qualified radiographers and had 1-25 years of experience working with ionizing radiation (IR) in the context of the cardiac catheterization laboratory.

### **3.2 Coding Paradigm.**

There are a few coding methods that I could have utilized in my research study and I chose to apply an open-ended coding method, having in mind the research topic and questions. Stuckey mentioned that before jumping into the process of coding data, it is important to think about your research question and the big picture, which some may refer to as “*storyline*” or “*meta-narrative*.” The process of coding breaks the data into parts so that the data are manageable, with the result of rebuilding the data to tell a storyline. This is related to the establishment of themes, which will be discussed in the next issue. (Stuckey, H.L, 2015).

However, during the data coding process, I initially went through the data systematically, this enabled me as a researcher to understand the nature of the data collected and how the data related to the research topic that was under investigation. I read the data line by line and used the NVivo 12 Software program to code and analyze the emerging categories and themes from the transcribed data.

### **3.3 Data Collection.**

I chose semi-structured interviews as the data collection method for this project, the reason is that semi-structured interviews are common in qualitative research and have the familiarity of human-to-human conversation that we have every day. This method allowed me to be flexible on interview questions and made changes in the process of data collection. This affected the replicability of data generated due to changes in interview questions.

The data had been voice recorded and transcribed using a Microsoft Word document. The transcribed data were double-checked against voice-recorded interviews.

### **3.4 Data Analysis.**

Before the process of data analysis, it was significant to understand the theoretical aspect of grounded theory data analysis and coding. Coding is the first phase of analysis. Jørgensen highlighted grounded theorists create codes as they study their data and, in abbreviated terms, define what they see in it. Coding helps the

researcher begin to conceptualize what basic processes occur in the research setting or situation. (Jørgensen, 2001). Charmaz stated in her book on Constructing Grounded Theory that:-

*“coding means categorizing segments of a data with a short name that simultaneously summarizes and accounts for each piece of data”.* (Charmaz, K. 2014: 138p).

To code the data, I needed to select the data, analyze and sort the data in a systematic way to execute a meaningful data inquiry and study the data. I had to take steps to arrange my data into a structured form by systemically transcribing data into a text format using NVivo software and a word processing application. I studied the data in detail and coded using available software and data formed with patents that represented parts of the data. (Rejnö, Å., Berg, L. and Danielson, E., 2014). The systemic data analysis empowered me to preserve the originality of the data and reassure the reliability and validity of the data using a deductive approach.

Data analysis is a recurring process or a journey of describing and identifying project data in a meaningful way. It is presenting data in a theoretical framework that can be discussed and analysed. Qualitative data analysis is a process of reviewing, recapturing, and interpreting data to describe the social phenomena studied (Bazeley, P. 2013). This involves data processing of the research to discover themes, categories, and meaningful social meaning of a specific issue or a way of life of a social phenomenon (Castleberry, A Nolen, A, and Castleberry, 2018). This means understanding, analysing, and studying one case through meaningful data collected from participants. As indicated previously, the grounded theory will be used, and the theory could emerge through qualitative data analysis. The data collection methods employed will be used and data will be coded and recoded. The emerging categories will be focused on and analysed until complete data saturation is achieved.

Thematic analysis is one of the most conventional forms of analysis in qualitative research. It emphasizes indicative, studying, and recording patterns (or "themes") within data. (Braun, V. and Clarke, V., 2020). Themes are categories across data sets that are important to the description of a study and are associated

with a specific research question using thematic data analysis coding involves three levels of analyses: (a) open coding, (b) axial coding, and (c) selective coding, to gather a complete picture of the information obtained during the data collection process. (Corbin, J. and Strauss, A., 2008).

Vaismoradi, M. and Snelgrove, S., (2019) highlighted that thematic analysis is an interpretive process in which data are systematically searched for patterns to provide an illuminating description of the phenomenon. Thematic analysis can provide rich insights into complex phenomena and be applied across a range of theoretical and epistemological approaches and expanded upon or test existing theory (Braun, V. and Clarke, V., 2020). Thematic analyses move beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas within the data, that is themes. (Guest, G., Namey, E., and Chen, M., 2020). However, Clarke and Braun also mentioned it can be used to analyses different types of data, from secondary sources such as media to transcripts of both large or small data-sets; and it can be applied to produce data-driven or theory-driven analyses. (Braun, V. and Clarke, V., 2020).

This project employed thematic analysis for data analysis and interpretation. I have used Braun & Clarke 6 point analysis of familiarising myself with my data, coding, generating codes, reviewing themes, definition and categorising themes, and writing up findings. (Braun, V. and Clarke, V., 2020). The themed data that emerged from research participant’s data were analysed as indicated in Table 2. The emerged themes were conceptualized and discussed separately using the thematic analysis method. Each theme has it is merits and distinctions that require explanatory investigation.

**Table 2: main themes and category titles.**

<b>TABLE 2.0</b>		<b>MAIN THEMES.</b>
<b>THEME</b>	<b>THEME CODES</b>	
1	Interaction, Communication barriers, and challenges.	
2	Patient Care in Cardiac Radiography.	
3	Radiobiological Effects for both Patient Care and staff.	
4	Multidisciplinary and Inter-Professional Meeting.	
5	Patient Anxiety and fear-claustrophobic attacks	

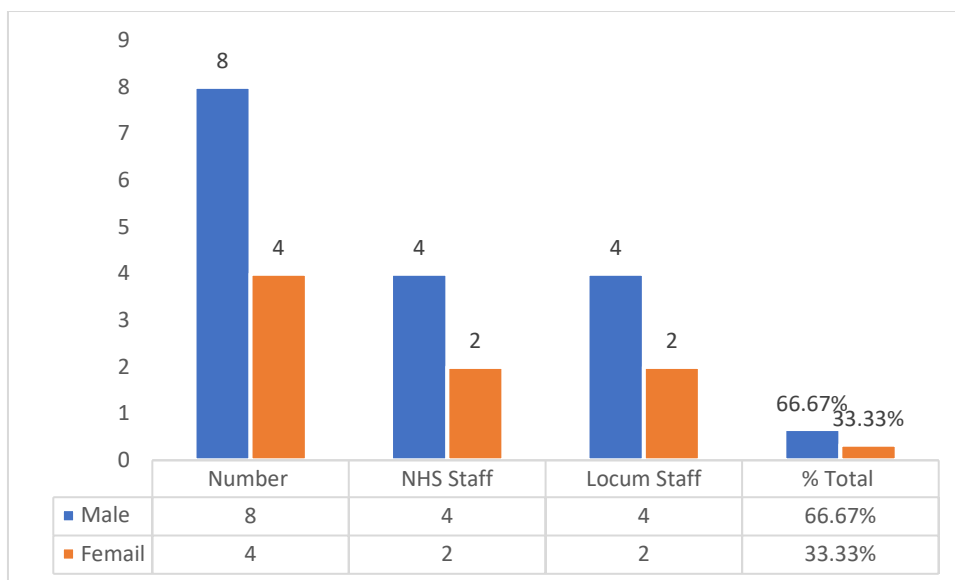


## Chapter 4: Project Activity.

### 4.0 Introduction.

I had initially engaged with cardiac radiography colleagues as a peer group in discussing with them my project and providing an overview of what my research project involved. I had also met the cardiac radiography manager and discussed with them the ethical issues that related to the project. I had originally planned to develop a questionnaire as a method of data collection due to the workload of cardiac radiographers. However, I preferred to use the semi-structured interview technique method which would empower me to achieve rich data and enabled me to have a relationship with my data

I did initially email all participants about my research study and the cardiac radiographers were informed about the study by their radiography team leader. I did invite participants during a staff meeting. In order not to compromise the department workload, research participants were given the option of suggesting a time for the interview. Participants scheduled their interview times and chose their interview timing space. The department has a dedicated interview room and this facility was free for the research interviews. All interviews were conducted in the interview room where privacy was guaranteed. To generate a theory from the data and grasp a well-grounded theory, my research study employed a semi-structured interview method. A semi-structured in-depth interview was conducted with 12 participants and the data were coded and analyzed. The merging themes were studied. (Adams, J. & Smith. T., 2003). Sixty-six point sixty-seven of participants were male and 33.33 per cent were female. Total research participants were 12, 8 male and 4 female. There were six NHS-Contracted full-time and six locum cardiac radiographers who participated in the research. Figure 3 illustrates the number of research participants alongside the percentage of male participants compared to female participants.



Semi-structured interviews allowed me to generate enough data and enabled participants to answer questions in the dept. Edwards and Holland stated that as human interaction and negotiation is seen as the basis for the creation and the understanding of social life in interpretive approaches, it is the interaction of the participants in the interview situation – the researcher and the researched – that creates knowledge. The data in the form of talk that comprises the interview is regarded as a co-construction. (Edwards, R. and Holland, J., 2013). The semi-structured interview technique empowered me to have the ability to improve data situations by asking participants questions that came up during the interview. It provided me with the ability to change questions slightly. I used the first few interviews as a pilot study and interviewing participants enhanced my interview technique.

Before the interview's commencement, participants were given a Personal Information Sheet (PIS) which stated the purpose of the study, rationale, and what I will do with their data after the project completion date (*Appendix 5*). After the prospective participants felt contented with the contents of the personal information sheet, they then offered to choose their interview date and times. The participants signed a consent form before their interview sessions. These ethical procedures have been recorded and the participant's identities were anonymized.

All the interviews were tape-recorded. I commenced the interview by asking research participants "Do you communicate and interact with your patients prior, during, and after a procedure on every occasion?" There was a time that the research questions were modified and the interviewee was asked the same thing in different ways to encourage the participants to clarify their experiences. The interviews lasted between 20-

30 minutes and were conducted between October-November 2019. Each interview was digitally recorded and transcribed verbatim for analysis. Also, member checking was carried out by returning transcripts to the participant within one week of the interview to review for accuracy. Tierney, Seers, Tutton & Reeve stated that semi-structured interviews gave people time to express themselves and enabled the researcher to pursue unanticipated areas raised by participants to reflect incoming data and the emerging analysis. (Tierney, S., Seers, K., Tutton, E. and Reeve, J., 2017).

An individual semi-structured interview was conducted with twelve cardiac radiographers who had different experiences. *(Please find the Indictive Questionnaire in Appendix 6)*. These interviews lasted up to 45 minutes with additional time offered should participants need this. Interviews were conducted in a confidential venue inside the hospital and participants had a personal information sheet and consent form to sign before their interviews.

As a novice researcher, I developed my interview techniques as the interview sessions progressed. I had never engaged in interviewing people to this extent. The main challenges were time management for participants and some of them struggled to find a time during the day and because of this need, there were several rescheduling of interview times and cancellations. It was also difficult for me to manage between working and research periods. I had meetings with my academic advisors both physically and zoom online. These sessions provided me with the guidance and support I needed and were focused on the project development, reflection on personal development, and meeting academic research deadlines.

#### **4.1 Insider Researcher.**

As I have progressed through my research, I have been considering my project themes and the best way to go about this. I work in several different roles and it has been challenging when deciding which area to focus on. I have decided to focus on my project of the communication and interaction method of cardiac radiographers and patients in the Cardiology Department.

I had initially decided to investigate the relationship between professionals and patients in the department and study issues from the service users side however, after researching some published studies about patients in the cardiology department I found that nothing has been said about the feelings of professionals/

service provider's perspectives. I felt that it might be more beneficial to focus on professional/service-provider perspectives on the communication and interactions between cardiac radiographers and patients in the cardiac catheterization laboratory. Cardiac radiographers work under a pressure during primary and elective angioplasty procedures and have a duty of care to their patients. Communication and interaction remain the backbone for caring for patients and staff and there are not guidelines and support for cardiac radiographers about patient care and communication in the cardiology department. This research project is to highlight these problems and I hope to answer these problems and from this to act on potential findings to ensure the service is accessible to those it is designed to support.

Another potential barrier of undergoing research includes the lack of research understanding within the radiography profession– this may influence and/or hinder potential opportunities concerning this project due to lack of academic support from colleagues and management (Weller, G. 2012). Before doing my postgraduate degree and the completion of my research proposal I had placed a great emphasis on cardiac radiography professionals and management. I had discussed my ideas for this project with my line manager and director and both were happy to let me proceed with this opportunity due to the lack of work-based learning research (Costley, C., Elliott, G. and Gibbs, P., 2010).

The advantages of an insider-researcher include a unique position with special knowledge about the issue to which I was addressing. For example, I have access to the staff and appropriate information, an understanding of the internal politics, and the emotional intelligence and experience to deal with insider politics and when to use sensitivity in particular situations. Work-based learning experiences provided me with the prospect of enhancing my skill in communication, enthusiasm, and attitude, teamwork, networking, problem-solving and critical thinking, and professionalism. These improvements in skills provided me with a competitive advantage for achieving my career goals. (Teusner, A., 2016).

In summary, it is also important to state here that through this unique insider-led position, and as made evident by (Costley, C., Elliott, G. and Gibbs, P.,2010). Due to this informed perspective, I was in a much better position to challenge the status quo. Other potential challenges include confidentiality and the handling of sensitive data. This however will be addressed throughout the discussion chapter.

## **4.2 Confidentiality.**

All information collected was to be kept strictly confidential. No personally sensitive information will be collected. The data will be stored under the relevant data protection legislation. Radiographers are ethically and legally obliged to protect the confidentiality and security of patient information acquired through their professional duties, except where there is a legal requirement to do otherwise (SOR, 2019).

The issues of confidentiality and data protection were dealt with and participants remained anonymous. My research participants had a Personal Information Sheet (PIS) before the data collection and verbal and written consent was gained from them. (SOR, 2002). The issues of confidentiality and data protection would ensure all participants remained anonymous. Prior to the data collection, verbal and written consent was gained from participants by signing a consent form and statement of acceptance to be able to partake in the research project.

The Participant Information Sheet (PIS) contained details about the project, the aim of the project, and what I was intending to do with the information gained from participants. The code of ethics covered the anonymity of the participants, confidentiality, and the right to withdraw without a reason.

## **4.3 Ethical Considerations.**

The study was approved by the Middlesex University School of Health and Education Health and Social Care Ethics Sub-Committee. *(Please find Appendix 4).*

Ethics is defined as “an analytical and methodological inquiry of how moral judgment is made and should be made”. Ethics includes the conduct publicly displayed by the radiography profession and its applications of the principles of ethics that affirms the individual as an independent, autonomous, and responsible decision-maker. (Brittain, S., Ibbett, H., de Lange, E., Dorward, L., Hoyte, S., Marino, A., Milner-Gulland, E.J., Newth, J., Rakotonarivo, S., Verissimo, D., and Lewis, J., 2020). My research project will address ethical and legal issues, SoR research strategy highlights that radiographers have a professional and ethical responsibility to actively engage in research to develop the body of knowledge for the profession.

The Personal Information Sheet (PIS) highlighted the code of ethics and had been supplied to all with the right to withdraw and the assurance of data protection. Health care professionals have responsibilities for

their actions, as Ehrlich and Daly said that “all staff must become familiar with the moral, ethical and legal implications of their professional practices”. (Ehrlich, R.A. and McCloskey, E.D., 1989). Therefore, all healthcare professionals must understand the principles associated with informed consent and the process of obtaining informed consent before any research activity.

#### **4.5 Summary.**

In this chapter, I have explained my research journey and activities from the onset of the project. I engaged with my peer groups and discussed with them about the project and asked them to participate in the project. I have developed the Personal Information Sheet (PIS) for participants and the Consent Form. I illustrated the sociodemographic details of my research participants such as gender, years of experience, and percentage of male and female participants in my project. I explained my role as an insider researcher and highlighted how this helped me to execute my research project. I also underlined my experience of the research ethics approval process and the importance of safeguarding participant’s personal information. I reassured all my research participants that no personally sensitive information would be collected.

My project activity was overall a learning process that helped me shape my research skills and bring about the final execution of this research project.

## Chapter 5: Project Findings.

### 5.0 Introduction.

The cardiac radiographers highlighted the difficulties faced by professionals day by day in relation to communication and interacting with their patients in the cardiac catheterization laboratory. The analysis resulted in five main themes articulated by participants as indicated in table 2. The themes were Interaction, Communication barriers, and Challenges, Patient Care in Cardiac Radiography, Radiobiological Effects; Patients and staff, Multidisciplinary and Inter-Professional Meetings, and Patient Anxiety and fear-claustrophobic attacks. The main theme that emerged from the data was communication phases (prior, during, and post) in the cardiac catheterization laboratory.

TABLE 2		MAIN THEMES
THEMES NO	THEME CODES	
1	Interaction, Communication barriers, and challenges.	
2	Patient Care in Cardiac Radiography.	
3	Radiobiological Effects for both Patient Care and staff.	
4	Multidisciplinary and Inter-Professional Meeting.	
5	Patient Anxiety and fear-claustrophobic attacks.	

#### Theme 1; Interaction, Communication barriers, and Challenges.

The participants explained how they communicate with their patients from the start of the procedure and participant Three stated:

*“First at the beginning of the procedure, I confirm their identities and explain to them what the procedure is about, and I’ll explain to them whether we’re going to give them x-ray dye /contrast agents. So, I will explain to them the side effects of everything and the pros and cons of the procedures. So, I communicate with them effectively” (Rad 3).*

When participants were asked about communication methods used by professionals, they highlighted the communication methods as verbal and non-verbal and said.

*“It is important to communicate and understand the patient by using verbal and non-verbal communication methods” (Rad 6).*

When participants were asked what is communication? They mentioned that;

*“communication is a two-way process whereas one sends a message, and one receives the message”*

(Rad 1).

The participants also stated that it is important to have eye contact with your patients when interacting and communicating with them;

*“using more physical gestures could be better more eye contact”* (Rad 11).

Therefore, when participants were asked about where and when they meet with the patients they mentioned:

*“I meet patients inside the catheterization laboratory, and I do not have time to explain everything”*

(Rad12).

However, there are challenges to communicating and interacting with patients and when participant two was asked what were the challenges and barriers to communication, she mentioned that:

*“Sometimes you have a patient that comes unconscious and we do not know absolutely anything about them. Not even the name sometimes, or the language barrier can be one of the challenging parts. Because maybe if there's a patient that is alone, and nobody is speaking his language”* (Rad 2).

It is challenging to assess primary patients (Emergency) and provide information and professionals need more time to assess those patients. Participants state that;

*“We may not be able to meet emergency patients prior to the procedure and need more time to assess them”* (Rad 7).

Participants acknowledged there are different ways to improve communication with patients and pointed out;

*“So it's good to speak to them slowly and calmly and clearly, that's very important”* (Rad11).

Participants also highlighted that:

*“We have to remember to speak in everyday language, plain English”* (Rad 4).



Participant eight also said;

*“We have a duty of care to communicate and interact with our patients”* (Rad 8).

All research participants indicated the importance of communication between cardiac radiographers (participants) and their patients. The issue of communication and interactions between participants and patients has been mentioned a great deal.

## **Theme 2; Patient Care in Cardiac Radiography.**

Participants identified the theme of patient care in the cardiac catheterization laboratory and explained they provided care in the cardiac catheterization laboratory with high morale and dignity.

*“We care for our patients with honesty, dignity and higher morale”* (Rad 4).

He further said.

*“We try to speak with a patient about not just Hello, how were you but of course we make sure if they have any allergies to contrast especially”* (Rad 4).

Research Participants also pointed out that the main aim is to provide better patient care.

*“Yeah, definitely as I also feel because I have a big role just to keep the quality of service and quality care to the patient. So, it the cardiac radiographer has a big role, just to optimize the radiation dose and give the quality care to the patients and reassure them”* (Rad 9).

The Research participants reiterated the care given by professionals and mentioned that they provided care to their patients with honesty, dignity, and high morale. They mentioned that it is their top priority to care for and reassure their patients during their journey through ionized radiation procedures.

## **Theme 3; Radiobiological Effects for both Patient Care and staff.**

Participants indicated radiation protection is one of the main themes that come out from the data and when asked about this subject they mentioned that:

*“We usually talk to patients about radiation dosage before the procedure, specifically ladies who are still within childbearing age (12-55 Years old) and explain to them they have a right to reject”* (Rad10).

Participants stated that the prevention and protection of patients from the biological effects of radiation remains the most important issue in the cardiac catheterization laboratory. Participants reiterated.

*“ We aim to reduce radiation doses for patients under three thousand grays. (3000gy).*

Participants explained that patients do not retain the radiation information given by the cardiac radiographers and said: *“When patients arrive in the catheterization laboratory, they are anxious and tend not to remember all the information”* (Rad 6).

Participant five also said:

*“ I always make sure that the patients are well and okay particularly if a lot of radiation from us potentially pasts the skin dose threshold, I make sure to inform them that they have received a lot of radiation and that there may be deterministic effects from that”* (Rad 5).

When asked how do cardiac radiographers protect their patients from ionising radiation they mentioned;

*“Firstly, I identify a patient name, date of birth and address and make sure that I have the right patient for the right procedure”* (Rad 12).

The other radiographer stated that:

*“ If the patient is a female and is at the age of childbearing are (12-55) years, we do a pregnancy test prior to the procedure”* (Rad 6).

However, cardiac radiographers have to take practical measures to reduce radiation effects for patients and they explained that:

*“ We use 3.5 to 7.5 fluoroscopy per second (low fluoroscopy dose ) level for all patients that are undergoing Ionised Radiation procedures”* (Rad 1).

He further said:

*“ We have a duty to protect patients and staff from unnecessary radiation”* (Rad 1).

All participants agreed that it is important to safeguard their patients from excessive radiation using ALARA Principles (As Low As Reasonably Achievable). They are specifically concerned with women of child-bearing age. Participants said they undertake practical steps to reduce the accumulated radiation received by patients.

#### **Theme 4; Multidisciplinary and Inter-Professional Meeting.**

Participants indicated it is also important to collaborate with multidisciplinary team members and stated that.

*“We work with the multidisciplinary team in our clinical setting and focus on achievement of person-centred care for patients and “This is a multidisciplinary (MDT) lead department” participant stated. (Rad 12).*

When asked the participants about roles and responsibilities of cardiac professionals, participant Rad1 participant said;

*“So, I think asking for clarification from your colleagues is very important. And things tend to just happen with people because everyone knows what they're doing. It has a lot of interchangeable roles” (Rad 1).*

On a multidisciplinary meeting and interprofessional collaboration, participant Rad 11 stated that;

*“We come together to plan diagnoses and treatment of patients in the cardiology department” (Rad 11).*

When participants were asked about the main advantage of multidisciplinary meetings in the cardiac catheterization laboratory. They highlighted

*“but it's nice because you learn from one another, it brings you closer to the ultimate goal, which is to diagnose and treat” (Rad 9).*

The information received by the patients must be staged and managed by cardiac radiographers, participants mentioned:

*“The Interpersonal communication between us and patients must be staged according to the patients’ information retention and consumption” (Rad 6).*

Another participant also mentioned that:

*“The information management to patients would help patients understand the procedure and comply with the directives given by professionals” (Rad 3).*

When participants were asked how and what they do in terms of multidisciplinary meetings they explained;

*“We do the (W.H.O) safety check List every morning also to make sure that we have the right patient. Yeah. And then after the procedure, you also will do the post briefing as well. (Rad 5).*

Summary: The Multidisciplinary Meeting is when healthcare professionals come together to discuss and plan the diagnosis and treatment of patients. This explores the ultimate goal of treating and diagnosing their patients with specific conditions requiring specific radiological interventions. The research participants stated that they focus on the achievement of person-centred care for patients.

### **Theme 5; Patient Anxiety and fear-claustrophobic attacks**

The research participants specifically talked about the patients who are anxious and claustrophobic. When asked about communication barriers and challenges for those patients in relation to communicating and interacting, participants mentioned that.

*“It is more challenging to communicate and come to an understanding with the claustrophobic patients, they have seemed not to listen and are anxious, very challenging for us to get them to cooperate” (Rad 3).*

Participants explained meetings with patients are emotionally stressful, anxious, and difficult.

*“ they must be anxious Of course and sometimes one other challenge is, for example, if you cannot interact with the patient, especially for the anxiety, or because they're very scared or stressed, and sometimes you cannot interact” (Rad 2).*

Research participant stated the methods that can be used to relax anxious and claustrophobic patient that is undergoing ionized radiation procedure. Participant 1 mentioned that;

*“We treat those patients with mild sedation to help relax patients” (Rad 10).*

The participants also stated,

*“We must interact with patients prior to the procedure to assess a plan for the procedure for claustrophobic patients” (Rad 1).*

Participants also indicated on this subject that.

*“We have a duty to care for the patient safety, comfort, and to see that they looked after, so that they felt they have been heard and that we're doing the right thing. And we will be able to answer all the concerns”* (Rad 6).

Participants mentioned that.

*“It is important that the patient is put at ease to ensure the successful outcome of the procedure”* (Rad 1).

## **5.1 Summery.**

The research participants produced great knowledge on the research topic and contributed to the project. The project findings have explored the five main themes emerging from the investigation. The data were grouped into different themes and specific data from the participants' interviews were placed under each theme.

I have subtracted raw data from the participant's interview recording and organised it into a corresponding theme and indicated the category to which it belongs.

## Chapter 6 Discussion.

### 6.0 Introduction.

The research participants presented a good knowledge of the research topic being investigated viz. the communication and interaction between Cardiac Radiographers and patients in Cardiac Catheterization Laboratory. The analysis resulted in five main themes articulated by participants as indicated in table 2. The themes were Interaction, Communication; Barriers and Challenges, Patient Care in Cardiac Radiography, Radiobiological Effects; Patients and staffs, Multidisciplinary and Inter-Professional Meetings and Patient Anxiety and fear-claustrophobic. The categories will be discussed thematically and therefore, the most important issue is how communication in the cardiac catheterization laboratory could be identified?

### 6.1 Theme 1; Interaction, communication barriers, and challenges.

The participants mentioned that to maximize the daily throughput of elective and emergency procedures it is imperative that we can ‘communicate with all professionals at all levels, with the ability to think and act quickly and make independent decisions. This is a prerequisite to be able to offer the patient their choice of care, attention, and treatment. However, the cardiac radiographers have raised their concern over time management and mentioned that extra time was needed to be able to meet the patients and gain sufficient information before their procedures.

Experts define communication in different ways. Communication is an exchange of information.

Communication is a mutual exchange of facts thoughts opinions or emotions. This requires presentation and reception resulting in common understanding among all parties Communication is a two-way process of transferring thoughts and ideas from one mind to another mind to say that we may conclude that communication is a purposeful activity through which messages are transmitted from one person to another through a language common to both in the communication process (O'Toole, G. 2020).

The social scientist defines communication as a frequent exchange of information. Business managers put stress on the importance of corporate goals and objectives. The word communication stems from the Latin word communicate meaning to share, to have in common. Professional communication is how people relate to one another at work, in school, when conducting business, and in public speaking. It is an effective

practice to communicate professionally whenever you are informing or persuading others to get work done (Bonaccio, S. O'Reilly, J. O'Sullivan, S.L & Chiochio, F 2016). Therefore, communicating professionally refers to the verbal, nonverbal, written, and visual methods you use to convey messages to others as well as the verbal, nonverbal, written, and visual ways you provide feedback to the messages you receive.

Professional communication can help you function effectively and confidently in the workplace Pollard, N., Lincoln, M., Nisbet, G., Penman, M., and Pollard, N. (2019).

Communication and transactional analysis has been documented in Eric Berne's transactional analysis model. This helps understand why we think, act, and feel the way we do as well as determine the ego state of the communicator (whether parent-like, childlike or adult-like) as a basis for understanding behaviour. Stewart, I, 2013).

Participants highlighted that good communication between cardiac radiographers and cardiology patients was dependent on an awareness of the principles of good communication. When you are communicating professionally, your number one consideration should be your audience, so you can tailor your message to be well received, and so your purpose is clear and can be achieved (Christensen, B.M., Nilsson, S., and Stensson, M., 2020). Participants highlighted "Communication methods do influence person-centred care for the patient and communication is what enables health care professionals to work together so they can accomplish their shared principles and objectives" Cardiac Specialty Radiographers need an ability to communicate effectively and respectfully in the workplace and adopt collaborative and interdisciplinary ways of communication in the context of cardiological interprofessional working.

The participants highlighted the importance of professional communications within the cardiac catheterization laboratory and stated that open communication can have a positive impact on caring for patients in general and achieves the best outcome for the procedure as well as the overall cardiological service. The significance of interaction and communication with patients has been emphasized by cardiac interventional radiographers. The participants stated that having meaningful interaction and communication with your patient is vital for patient care during and post procedures. "Communication is the backbone of patient care and treatment," participants said.

Cardiac radiographers highlighted that they do not have sufficient time to care for patients and lack of time for patient care remains one of the main challenges in the cardiac catheterization laboratory procedures. “We do not have access to patient clinical records prior to their procedure” participants said (Norouzinia, R., Aghabarari, M., Shiri, M., Karimi, M. and Samami, E. 2016). Cardiac radiographers always encounter their patients inside the cardiac catheterization laboratories, unlike nurses and cardiologists who meet patients outside the catheterization laboratory. Introductions between radiographers and patients take place just before the initiation of the procedure. Cardiac radiographers did not have time to properly introduce patients and provide information about ionizing radiation relating to the procedure.

Communicating with the patient in the cardiology department and having meaningful interaction with them before their procedures may decrease the risk of breaching the patients’ integrity and might increase the possibility of responding to different patients’ needs. (Berg L, Skott C, Danielson E; 2007. Billeter-Koponen & Freden, 2005). Communication influences efficient information exchanged between the professionals and the quality of the examination that is being performed in the imaging department. (Meads, G, Ashcroft, J. Barr, H, Scott, R. & Wild, A.,2005). Communication can be a two-way system if one of them is reduced or blocked it will affect the patient health care and can also obscure the decisions and understanding between the inter-professional collaboration of patients and their carers.

Communication lies in the heart of patient care and plays a great role in the patient’s diagnostic angiographic procedures. As (Ehrlich, R.A. and Coakes, D.M., 2016.) described communication depends on culture and environment. People have different cultures and also different communication methods. Therefore, there are as many different ways of communication as there are different patients in the hospital. There is verbal communication where you need to speak to the patient face to face. Health care professionals can receive and send messages to the patient in different ways such as body language, eye contact, posture, gesture and so on An elderly patient can require repetitive messages and reassurances. (Corcoran, N. ed., 2013).

Cardiac radiographers receive patients from diverse cultural backgrounds and we must endeavour to accomplish and relate to one another in meaningful ways. The cultural competence of cardiac radiographers has been measured. The issue of uncertainty becomes relevant in the radiography profession. The



uncertainty of our radiographer's experience had a disempowering effect which is characterized by anxiety and stress in cross-cultural interactions and apathy in their clinical approach. (Chau, M., 2020).

The participants mentioned that there are different techniques of communication and they depend on the patient's condition, age, religion, and social life. These are, introductions to the patient before the procedure, identifying patients by asking for their details, and checking that with their clinical notes and it is important for all staff members involved in a procedure to introduce themselves. This is also carried out with the WHO checklist on all patients undergoing a procedure or simply when explaining about the procedure, facts such as the use of x-radiation, x-ray contrast, and effects of other medications. Communicating with patients before the procedure always helps to identify the correct patient and also builds the patient's trust during a procedure. To provide high-quality patient care, it is very important to know the patient's needs and obtain adequate information to complete the procedure, which includes checking the patient consent form, patient Identification (ID), allergies, pregnancy status, and past medical history.

#### **6,1a Communication Phases.**

There are three approaches and phases of communication they are prior, during, and post-procedural. The research participants pointed out "communication phases can be pragmatic and requires different communication skills". However, the communication model proposed by participants coincides with the communication framework model presented by Windover and his colleagues. In their study of The REDE model of healthcare communication (Relationship, Establishment, Development and Engagement (REDE) they stated the use of the framework has the potential to positively influence both patients and service providers and the REDE model applies effective communication skills to optimize personal connections in three primary phases of relationship: establishment, development, and engagement.

Table 3: REDE Model of Communication.

Relationship:		
Establishment Phase I	Development Phase II	Engagement Phase III
<p><b>Convey value &amp; respect with the welcome</b></p> <ul style="list-style-type: none"> <li>Review chart in advance &amp; comment on their history</li> <li>Knock &amp; inquire before entering room</li> <li>Greet patient &amp; companions formally with smile &amp; handshake</li> <li>Introduce self &amp; team; clarify roles</li> <li>Position self at patient's eye level</li> <li>Recognize &amp; respond to signs of physical or emotional distress</li> <li>Attend to patient's privacy</li> <li>Make a brief patient-focused social comment, if appropriate</li> </ul>	<p><b>Engage in reflective listening</b></p> <ul style="list-style-type: none"> <li>Nonverbally – e.g., direct eye contact, forward lean, nodding</li> <li>Verbally using continuers such as                             <ul style="list-style-type: none"> <li>“mm-hmm”, “I see”, “go on” or reflecting the underlying meaning or emotion of what is said –</li> <li>“What I hear you saying is...” or “Sounds like...”</li> </ul> </li> <li>Avoid expressing judgment, getting distracted, or redirecting speaker</li> <li>Express appreciation for sharing</li> </ul>	<p><b>Share diagnosis &amp; information</b></p> <ul style="list-style-type: none"> <li>Orient patient to the education &amp; planning portion of the visit</li> <li>Present a clear, concise diagnosis</li> <li>Pause if necessary</li> <li>Provide additional education, if desired &amp; helpful to the patient</li> <li>Frame information in the context of the patient's perspective</li> </ul>

(Windover et al. 2014).

The communication stages inter-relate to the information that is provided to the patients, this information consists of angioplasty/Angiography procedures, the protection of radiobiological effects of the procedures, and directive information for patients by instructing them to follow the advice given by professionals prior, during and post procedures. The information processing from patient to patient is different hence why the care needs and diagnosis are different. Communication phases are important for cardiac radiographers to provide better care and diagnosis to their patients and inadequate, imperfect fulfilment would compromise patients' care, safety, and the achievement of a good procedural outcome.

**Phase I:** communication before procedure involves the introduction of radiographers to their patients by name and profession and creating a dialogue (Fatahi, N., Mattsson, B., Lundgren, S.M. and Hellström, M.,2010). This allows participants to have effective communication with their patients and explain procedural information to patients prior to having cardiac interventional procedures. Benway, B.,2005) stated that

*“To increase retention, speak slowly and limit the amount of advice given to patients, focusing the content of the message on a patient's actions or behaviour helps to organize the information logically, focusing on the three to five most important ‘need to know’ points”* (Benway, B, 2005: pp 56).

In this phase, participants mentioned that “it is important to give patients an overview of interventional procedures they are undergoing and the radiographic technology involvement”. However, Cardiac interventional radiographers highlighted that communicating with patients helps them to understand if the

patients might have a contrast-induced anaphylactic reaction. Effective communication and interaction can save a patient's life and prevent possible complications that may arise during the procedure. The Royal College of Radiologist's guideline about the contrast allergic reaction stated that

*“ The individual administering the contrast must check that there are no contraindications to it is used and ensure that the patient understands and agrees to be injected”, (RCR, 2020: p6-9).*

The research participants mentioned that the challenges faced by cardiac radiographers in this phase include a language barrier, the first language of patients may not be English, and their linguistic ability may not be enough to comprehend the detailed procedural instruction and information provided. Therefore, they need a translator. In some cases, relatives may assist should the patient require an emergency life-saving procedure. It is at this moment that cardiac radiographers have to gain the trust of patients and explain the radiographic technology used by radiographers, help comfort patients, and reassure patients.

Participants stated this phase of communication should take place outside the catheterization laboratory settings when patients are more relaxed. This phase is important for cardiac radiographers to introduce themselves to the patient in a professional manner and provide patients with a radiological aspect of the procedure. Participants mentioned this is not taking place and cardiac radiographers only meet their patients inside the catheterization laboratory.

**Phase II:** Cardiac radiographers indicated that they were multi-task during the procedure and this involves communicating/caring with their patients and performing the procedure simultaneously. Participants must ensure that patients understand the significance of positioning supine with minimal patient movement for the duration of the procedure to produce an optimum diagnostic image quality (Pollard, N., Lincoln, M., Nisbet, G., Penman, M. and Pollard, N., 2019). This will help professionals to concentrate and optimize the procedural outcome. “ patient situation may change so does the treatment” cardiac radiographers mentioned, complications may arise during the procedure and patient's hemodynamics may change this includes ST elevation of the patient's Electrocardiogram (ECG) (which indicates complete blockage of coronary arteries), cardiac tamponade or a dangerous arrhythmia such as ventricular tachycardia that could cause sudden death. “This is the delicate part of the procedure,” participants said. Unfortunately, patients for Primary Percutaneous Coronary Angioplasty are stressed due to the complexities and time pressures and

may come for treatment completely unconscious and become awake during the procedure when hyperemia becomes evident.

Participants highlighted that with all these challenges and patients' conditions changing they are responsible for sophisticated radiographic technologies in the cardiac catheterization laboratory. The machinery used for the screening of a patient's coronary arteries needs special care and operational knowledge which cardiac radiographers possess and use to contribute to patient treatment and diagnosis. We must help cardiac consultants visualize coronary arteries using the minimal ionized dose limit under the ALARA principles (As Low As Reasonably Achievable) (Justino, H.,2006).

Cardiac radiographers stated that there are three main points that radiographers should focus upon during this phase of communication which is, having meaningful communication with patients by making sure they understand the procedure, patient care, and radiation protection of patients and staff. Achievement of these points depends on the method of communication used by cardiac radiographers with their patients and staff.

**Phase III:** The cardiac radiographers stated the last phase of communication commences after the procedure is completed and the team debriefs is signed off. The cardiac catheterization team have a team debrief for every procedure, it is the cardiologist registrar/consultant who lead and the team discuss any complications during the operation as well as the patient's care plan (Shrader, S., Kern, D., Zoller, J. and Blue, A.,2013).

World Health Organization International (WHO) described the Surgical Safety Checklist as aimed at decreasing errors and adverse events and increasing teamwork and communication in surgery. (WHO,2020).

“ It is not unusual for a patient to ask for a copy of the examination images with a completed report attached” (Kossmann, S.P. and Scheidenhelm, S.L., 2008). The research participants highlighted that patients would like to know the results of their investigation and complications and sometimes request a copy of the images and cardiac report always completed by a cardiologist.

‘Use of a safe procedure checklist in the cardiac catheterization laboratory (Lindsay, A., Bishop, J., Harron, K., Davies, S. and Haxby, E. 2018). The use of a team brief and WHO-derived safe procedure checklist in the CCL was associated with decreased radiation exposure, fewer procedural complications, faster turnarounds, and improved staff experience. Healthcare professionals use this term in their respective clinical practices. A team debriefs session (sometimes referred to as an after-action review or after event review) is a relatively

inexpensive intervention designed to promote learning from experience. During a debrief, team members reflect upon a recent experience, discuss what happened, and identify opportunities for improvement. (Eddy, A. (2010). Cardiac radiographers emphasized that a team debrief constitutes a routine review for professionals to learn from their mistakes and improve departmental services.

However, there are communication and interaction challenges faced by cardiac radiographers including pressure and limited time. They further explained that professionals have limited time to communicate and interact with their patients and specifically, who is coming for emergency procedures such as pericardiocentesis a condition in which patients have developed fluid in their pericardial space.

Pericardiocentesis can be caused by a wide variety of malignant or nonmalignant causes. Known etiologies include infections, neoplasia, iatrogenicity, congestive heart failure, and metabolic causes (hypothyroidism, uremia), as well as pericardial injury (e.g., following myocardial infarct, thoracotomy, or trauma), radiation, connective tissue diseases, and trauma. (Strobbe, A., Adriaenssens, T., Bennett, J., Dubois, C., Desmet, W., McCutcheon, K., Van Cleemput, J. and Sinnaeve, P.R., 2017).

The sub-theme that relates to the challenges that cardiac radiographers meet up with every day is the language barrier. In the process of patient consent and procedural information, patients must understand the risks associated with the treatment including side effects. Patients must sign a consent form and confirm that they understand what is involved within the operation such as sudden death. There are interpretation and translation services available, however, this is impossible for the emergency patient who requires lifesaving procedures. (Primary Percutaneous Angioplasty, Transcatheter Aortic Valve Implantation (TAVI). Cardiac radiographers questioned the ethics of translation services provided by some of the multi-ethnic professionals that speak the patient's ethnic language.

The barriers can be involved with words that the language use. The misunderstanding between cardiac radiographers and patients can be caused by technical vocabulary, ambiguous terms, and all the jargon used by professionals and this can cause a real barrier. The challenges and barriers also include disorganized information and overload given to patients (Brandenburg, S.J., 2017). To overcome the communication barrier radiographers must use clear and concise language. Cardiac radiographers must organize the information provided to patients and not overload them with information. The communication method used

by cardiac radiographers can be divided into three phases (prior, during, and post-procedural) and this is based on procedural stages and treatments for individual patients.

## **6,2 Theme 2; Patient Care in Cardiac Radiography.**

Patient care in cardiac radiography is challenging due to patient hemodynamic system changes and professionals require skills to understand those changes and respond accordingly. The injection of contrast dye causes transient nausea and vomiting in 3% to 15% of patients, itching or hives in 1% to 3%, and a life-threatening allergic reaction in approximately 0.2%. For individuals with abnormal kidney function, the administration of an excessive quantity of contrast dye may worsen kidney function. A major complication, such as death, heart attack, or stroke, during or within 24 hours of catheterization occurs in only 0.2% to 0.3% of patients. (Lange, R.A. and Hillis, L.D., 2003).

Barrett, Sellman, and Thomas (2004) mentioned that “effective diagnostic imaging relies on the ability of the radiographer to establish quickly a working relationship with the patient”. This will assist the other health care professionals to understand what is happening inside the patient. (Barrett, G., Sellman, D., and Thomas, J. eds., 2004). Likewise, Smith and Jones (2007) described that radiographers claim expertise in optimizing radiographic image quality and limiting radiation exposure. In modern medicine radiographers present imperative information about what is going on inside patients. (Smith, T. Jones, P, (2007).

Participants stressed that the main phenomenon in the patient care plan is a sense of care. Participants stated that attention should be paid to issues that may affect the patient's ability to lie comfortably during the entire procedure. Patients generally want to be reassured that their comfort will be maintained before, during, and after the procedure. Participants continued that is very important to interact with the patient to identify the correct patient (by checking ID), to explain the procedures and provide a sense of care and build the patient's trust in these individuals involved in their care. This is important for the successful outcome of the procedure. Also, the patient must be constantly informed about what is happening throughout the procedure.

The patient will understand what is happening and will be less anxious about retaining the aftercare instructions e.g. if femoral puncture - not to bend the knee of punctured leg and also not to raise the head to

avoid bleeding. “Patient care is our priority” participants highlighted and explained it is their duty to help ease patient anxiety and stress during and after cardiac angioplasty and angiography. The research participant also mentioned that “patients’ treatment is vital, and everyone must be cared for according to their needs”. Cardiac patients have different needs and care according to their underlying morphology such as Coronary Heart diseases (CHD), Atherosclerosis, Hyperlipidemia, Hypertension, and Diabetes Mellitus (DM).

However, the research participants reiterated that professionals have a duty of care and should help patients feel safe, comfortable and that they are being looked after. In standard eight of the Statement of Professional Conduct of the Society of Radiography (SOR), it is stated: “radiographers must act in such a manner as to justify public trust and confidence upholding and serving both the public interests and the interests of patients” (Easton, S.2009). Specific care and treatment should be given for patients with contrast anaphylactic reactions. Cardiac radiographers should know if patients have allergic reactions, this can change the procedural setup and type of contrast that can be used to compromise patient kidney functions and provide patient constant observation and treatment for hydrocortisone injection (corticosteroid) used in the treatment of allergic reactions. Cardiac radiographers also have a duty of care for protecting patient’s visitors and staff from excessive ionizing radiation in the cardiac catheterization laboratory (Puzey, C, & Kealey, A.,2016).

Participants stated that the term Infection control and the importance of patient care in this Corona Virus (Covid-19) pandemic and underlined the significance of infection control in the cardiac catheterization laboratory. Handwashing remains the most important procedure for preventing infections. (Caps, masks, gowns, and gloves help to protect the patient by maintaining a sterile field). Protecting patients and staff may be accomplished by wearing proper gowning, gloving, and eyewear, disposal of contaminated equipment, and prevention and care of puncture wounds and lacerations. (Chambers, C.E., Eisenhauer, M.D., McNicol, L.B., Block, P.C., Phillips, W.J., Dehmer, G.J., Heupler, F.A. and Blankenship, J.C., 2006). Therefore, communication is the backbone of patient care, treatment, and discharge pathways and patients must understand the ionized radiological procedure and associated risks.

### 6.3 Theme 3; Radiobiological Effects for both Patients and staff.

Ionizing radiation used in the cardiac catheter laboratory is an issue of procedural safety and patient and staff protection. Two main ionized radiation effects are stochastic and deterministic effects. Deterministic effects (harmful tissue reactions) are due in large part to the killing or malfunction of cells following high doses from radiation burns. Stochastic effects, i.e., cancer and heritable effects involving either cancer development in exposed individuals owing to mutation of reproductive cells. (Younger, C.W.E., Douglas, C. and Warren-Forward, H., 2018). Cardiac radiographers mentioned that “It is our duty to protect both patients and staff from radiation”, they indicated the radiation threshold for the patient having Percutaneous Coronary Angioplasty (PCI) and angiography procedures is 3000Gy (Grey).

Some factors influence and dictate the level of radiation received by both patients and staff. Dose Area Product (DAP) measured by the unit of  $\text{Gy} \times \text{cm}^2$ , absorbed radiation dose which is sometimes called Skin Dose (SD) measured as Grey (Gy), and fluoroscopy screening time. (Mohammadi, M., Danaee, L. and Alizadeh, E., 2017). Cardiac radiographers stated that “ionized radiation protection is our highest priority” and emphasized that there are precaution steps implemented by professionals to provide radiation protection in the cardiology department. These include making sure all staff wears Personal Protective Equipment (PPE) for radiation protection (Lead Aprons, Glasses), radiation monitoring badges, and ‘As low as reasonably achievable (ALARA principles applied) (Kuon, E., 2008, pp.667-674). There are three standard ways to limit exposure; Time: For people exposed to radiation in addition to natural background radiation, limiting or minimizing the exposure time will reduce the dose from the radiation source. Distance: Radiation intensity decreases sharply with distance, according to an inverse-square law (in an absolute vacuum).and Shielding when air or skin can be sufficient to substantially attenuate alpha and beta radiation. Barriers of lead, concrete, or water are often used to give effective protection from more penetrating particles such as gamma rays and neutrons. Some radioactive materials are stored or handled underwater or by remote control (Averbeck, D., Salomaa, S., Bouffler, S., Ottolenghi, A., Smyth, V. and Sabatier, L., 2018, pp.46-69).

If the skin dose is above 3000Gy for the PCI patient a high skin dose protocol instruction should be reinstated and the patient must be checked 24, 72 hours for possible skin lacerations. Ward nurses should be instructed on skincare and there should be arrangements to follow up with the patient for a skin check and to



avoid the inadvertent radiation exposure of a pregnant woman. Many doctors and dentists abide by the "10-day rule"( Shoja, M., Soleimani, M., Ameriyan, M., Asbaghipour, N. and Hejazi, P.H., 2019, pp.132-136.) when X-raying a woman of childbearing age (12-55 years old). Exceptions would include urgent radiological examinations when the benefits of the examination are likely to far outweigh any small risk to the fetus from irradiation. According to this rule, all non-emergency X-rays are done within the start of the first 10 days of the menstrual cycle, when pregnancy is highly unlikely under the Ionizing Radiation Regulations (*IRR 1999*), British Radiation Protection Policy, The International Commission for Radiation Protection, Ionizing Radiation (Medical Exposure) Regulations (IR) (ME) R 2000) and a local rules as well as 'As low as reasonable achievable' ((Kuon, E., 2008, pp.667-674).

Research participants stated that "this is a part of the procedure that is not always explained", this is due to lack of time and workload pressures. Cardiac radiographers do not meet patients outside the cardiac catheterization laboratory, and this makes it impossible to explain to patients about radiation in the workplace and the Stochastic/Deterministic effects of having coronary angioplasty. Cardiac radiographers mentioned they meet with patients inside the cardiac catheterization laboratory and after introduction and W.H.O Check List for the procedure, radiographers have a minimum time to verbally consent and inform the patient about ionizing radiation risks associated with the procedures. The sophisticated radiological equipment and the environmental issues related to the cardiac catheterization laboratory make the patient confused and unsure about what happens next. This increases patient radiation risks and compliance with radiation protection measures for a patient undergoing cardiac interventional coronary procedures. Radiation protection in the cardiac catheterization laboratory applies to the inter-professional team working and professional collaborations in the department.

#### **6.4 Theme 4; Multidisciplinary and Inter-Professional Meeting.**

The cardiac catheterization laboratory is a multi-team working environment including Cardiac Radiographers (CR), Cardiac Physiologist (CP), Cardiac Specialist Nurses, Consultant cardiologists, Registrars, Anesthetists, Surgeons and assistances, and cardiac radiographers thus emphasizing the importance of interprofessional teamwork in the department. Cardiac Catheter Laboratory relies on its

teamwork. Inter-professional relations & communication between teams are very important for quality service and care to the patients.

Barnsteiner et al. stated that inter-professional collaboration is extremely important for achieving better person-centred care. The term means two or more health care professionals working interactively together for a purpose of improving the health care and wellbeing of a patient. (Barnsteiner, J.H., Disch, J.M., Hall, L., Mayer, D. and Moore, S.M.,2007). He further described that it is significant for health care professionals to maintain a high standard of collaboration and teamwork in patient care.

Barret, Sellman & Thomas (2005) mentioned that inter-professional collaboration means the process whereby members of different professions or agencies work together to provide integrated health and social care for the benefit of service users. However, radiographers and other health care professionals need to retain some inter-professional knowledge to achieve a higher degree of patient-centred care and improve overall health care quality.

All participants have expressed the need for mutual interaction and collaboration in the cardiac catheter laboratory. Working within a multi-skilled team is a great celebration of a dynamic teamwork environment that is working cohesively and keeping each other informed of what is going i.e. each other's role is the basic requirement of inter-professional collaboration. (Altmiller, G., 2018). Research participants articulated that radiographers and other health professionals have the power to give support to patients and help them to understand the procedure differently based on professional understanding and ensuring maximum benefit for the patients. The care plan and treatment are controlled by the multi-professional team who discuss individual cases assessing patients with their merits in the (MDT) meetings.

The advantage of multidisciplinary professional care is individual professionals will have the chance to contribute to patient care, treatment, and discharge plans. Patient's procedural safety will be reduced when assessed by professionals.

## **6.5 Theme 5; Patient Anxiety and fear-claustrophobic attacks.**

Fritsche, (2009), Rachman, (1997), & Thorpe, (2008) described claustrophobia as fear, being in a closed or small space or a room, or an anxiety disorder and that often results in panic attacks and can be the result of many situations or inducements. Claustrophobia could be initiated by conditions affecting the brain amygdala. The amygdala is known to play an important role in normal fear conditioning and is implicated in the pathophysiology of anxiety disorders. (Rauch, S.L., Shin, L.M. and Wright, C.I., (2003).

Participants reported that cardiac primary angiography procedures are unpredictable and can cause ambiguity and frustration. This may influence the patient's claustrophobic attacks during the procedure. The participants raised concerns about the claustrophobic patient with panic attacks, patients apprehensive about whether the procedure will hurt, and the most important part of the procedure which is the outcome and results. Therefore, there are external and internal factors that may affect claustrophobic patients in the cardiac catheter laboratory; these are the level of patient anxiety about the procedure, preconceived information, and complications that may develop during a procedure such as blood pressure. These findings regarding information are confirmed by Murphy (2001) who stated that when patients' preconception of an examination does not agree with reality, they get confused and can have unpredictable behaviour. They do not comply with directives and struggle to stay still. (Murphy, F, 2001). Information given to the patient must be consistent and the patient received both verbally and in writing. Information giving to patients in a consistent and manageable way will optimize the care of the patient during coronary angioplasty treatment and promotes the possibility of responding to all the patients' needs. This includes being able to relieve the patients from their pain and fear. The participants stated that the main challenges for claustrophobic patients are getting them to comply with all information due to their condition and lie flat with minimal movement for these are patients who are extremely anxious, claustrophobic, or who have medical conditions that make it difficult or impossible to remain immobile for the duration of their examination.

Participants confirmed claustrophobic patients will be treated by using both an injection of a local anaesthetic to numb the area of the skin where a needle or catheter will be injected, and deep sedation to help the patient stay calm and relaxed during the procedure. The participants stated this will optimize the result and allow the cardiac investigative team to be able to achieve the best possible treatment and

diagnosis. On other hand, it will reduce the pain and agony that patients may experience during and after the procedure. The participants pointed out that administration of intravenous sedation to claustrophobic patients will make the treatment and procedure more controllable and hence will improve the care and outcome of the procedure.

The result is consistent with the study by Hellman and Lindgren (2014) in which they concluded that radiographers were aware of the fact that patients' needs included a preferred communication method, information, physical/mental care. It was also important that patients be examined by a professional senior radiographer who could customize the optimum imaging quality according to the patients' needs and wishes. The knowledge of a patient's claustrophobic attacks in connection with accessing and obtaining accurate patient medical records before the procedure will not only achieve optimum diagnostic angiographic images but will also contribute to effective day-to-day operations and overall cardiovascular service. (Hellman, E. and Lindgren, M., 2014).

The anxious and confused patients can be challenging, and they should be informed about the technological imaging equipment involved with the procedure and of the importance of lying supine on an extremely narrow table to control patient movement. Participants described that "it is necessary to check the patient's condition regularly. It helps the patient to feel comfortable and informed during and throughout the procedure from start to end. Cardiac radiographers highlighted that patients come with anxiety and stress before the procedure and it is important that the professionals have effective communication with patients undergoing cardiac ionized operations. Murphy mentioned that the patient experience when undergoing a high technology imaging procedure is unique, diverse in content, and symbolized before the patient arrives in the department by informal social encounters. Many factors influence the success of the examination where previous poor experiences, common mythologies, and negative stories can all have a profound undesirable effect on patient expectations (Murphy, F, 2001). However, the cardiac radiographers have raised their concern on time management and stated to be able to meet the needs of the patients and provide sufficient care, participants indicated that they require time to interact and communicate with their patients prior to their procedure.

Having meaningful communication and interaction with patients will have a momentous outcome for a patient's procedures and treatments. This will empower cardiac catheterization radiographers to have a strategy for each patients' care, diagnosis, and treatments. Most importantly, cardiology patients will have the knowledge and step-by-step awareness of the procedures they are undergoing. Patients' rights to refuse the diagnosis and treatments would be highlighted and patient involvement with their care and treatment would be transparent and evidence-based practice.

## Chapter 7: Conclusion.

This study represents the radiographers' experiences of communication and interaction with patients undergoing coronary angiography and angioplasty procedures. Cardiac radiographers have raised their concern about time management and stated to be able to meet the patients and provide care, sufficient time is needed. These communication barriers and challenges can be resolved with effective communication methods. The misunderstanding between cardiac radiographers and patients can be caused by technical vocabulary, ambiguous terms, and all the jargon used by professionals -this can cause a real barrier. The challenges and barriers also include disorganized and overloaded information given to patients. Cardiac radiographers must organize the information provided to patients and not overload them with information.

The information processing from patient to patient is different hence why the care needs and diagnosis are different. Communication phases are important for cardiac radiographers to provide better care and diagnosis to their patients. Inadequate, imperfect fulfilment should not compromise patients' care, safety, and the achievement of a good procedural outcome. The meaningful interaction and communication between cardiac radiographers and patients are vital for the care and treatment of cardiac catheterization laboratory patients. To reassure and comfort patients for primary percutaneous coronary angioplasty and angiography cardiac radiographers must implement three phases of communication. The prior, during, and post communication phases and interaction between professionals and cardiology patients will only not empower patients with an awareness of the procedure but also helps patients comply with directives from operators and enhance results and outcomes.

The research proposes the challenges faced by cardiac radiographers include lacking time to communicate with the patients prior to the procedure, checking for possible allergies, procedure contraindications, and a patient's pregnancy status. To overcome the language barriers and challenges radiographers must speak clearly and concisely. The anxious and confused patients can be challenging, and they should be informed about the technological imaging equipment involved with the procedure and the importance of lying supine on an extremely narrow table with minimal movement. This study highlighted communication and

interaction challenges between cardiac radiographers and patients and the importance of implementing ways to improve communication methods and techniques used by these professionals.

However, this study recommends that cardiac radiographers need to establish a meaningful interaction and dialogue with the patients. The context of communication between cardiac radiographers and patients must be recognized. The cardiac radiographers need to develop and apply routine (prior, during, and post) procedures, communication phases that help the patients retain information and comply with the guidance. However, In the minds of the cardiac radiographers all patients deserve to have person-centred treatment, diagnosis, and care. These research findings and outcomes should be applicable and transferable into general radiography practices and similar healthcare settings.

This research has helped to highlight an important area of healthcare practice in ensuring that patients are informed about the radiography treatment that they require. The radiographer role has evolved into a highly professional and technically complex process in patient care and radiographers need to adopt appropriate and professionally relevant communication to ensure that patient understanding. It should also be incumbent upon the radiographer to establish a professional identity amongst the range of medical clinicians in terms of professional identity. To this end, effective communication can only help to raise professionalism within the healthcare community. This research will continue with further development and dissemination of a thematic model of radiographer identity and communication good practice.

## Chapter 8: Dissemination of Findings.

The result of the project will be distributed to current professional practice in both general and interventional radiography by disseminating research outcomes through the publication of Middlesex University Research Repository, Work-Based Learning e-Journal International, Society of Radiographer Journal, and Research Gate database as well as Google Scholar. This will disseminate the result into the wider research engines and databases. The result will also be distributed by creating a poster and present the research outcome to the United Kingdom Imaging & Oncology Congress (UKIO). The findings will be published in the British Society of Cardiovascular Imaging (BSCI) journal and the European Association of Cardiovascular Imaging (EACVI) online journal.



## References.

- Abrams, H., (1996) History of cardiac radiology. *American Journal of Roentgenology*, Volume 167, pp. 431-440.
- Adams, J. & Smith. T., (2003) Qualitative methods in radiography research: a proposed framework. *Radiography*, 9(3), pp. 193-199.
- Altmiller, G., (2018). Interprofessional teamwork and collaboration. *Introduction to Quality and Safety Education for Nurses: Core Competencies for Nursing Leadership and Management*, p.211.
- Averbeck, D., Salomaa, S., Bouffler, S., Ottolenghi, A., Smyth, V. and Sabatier, L., (2018). Progress in low dose health risk research: Novel effects and new concepts in low dose radiobiology. *Mutation Research/Reviews in Mutation Research*, 776, pp.46-69.
- Ionizing Radiation. [Online] Available at [http://en.wikipedia.org/wiki/Ionizing\\_radiation](http://en.wikipedia.org/wiki/Ionizing_radiation)  
[Accessed 28 11 2019].
- Baird, M.A. (2008) 'Towards the development of a reflective radiographer: Challenges and constraints', *Biomedical Imaging and Intervention Journal*, 4(1), pp. e9. doi: 10.2349/bij.4.1.e9.
- Bazeley, P. (2013) *Qualitative data analysis : practical strategies*. Los Angeles: SAGE.
- Benway, B. (2005) '*NO PATIENT LEFT BEHIND*', *Medical Marketing and Media*, 40(2), pp. 50-53.
- Berg, L., Skott, C., & Danielson, E. (2007). Caring relationship in a context: fieldwork in a medical ward. *International journal of nursing practice*, 13(2), 100–106. <https://doi.org/10.1111/j.1440-172X.2007.00611.x>

- Bleiker, J., Knapp, K.M. and Frampton, I. (2011) 'Teaching patient care to students: A blended learning approach in radiography education', *Radiography*, 17(3), pp. 235-240. doi: 10.1016/j.radi.2011.01.002.
- Boyes, C. (2004) 'Discourse analysis and personal/professional development', *Radiography*, 10(2), pp. 109-117. doi: 10.1016/j.radi.2004.02.003.
- Brandenburg, S.J., (2017). Nurse Perceived Barriers to Effective Nurse-Client Communication. pp,228.
- Barnsteiner, J.H., Disch, J.M., Hall, L., Mayer, D. and Moore, S.M., (2007). Promoting interprofessional education. *Nursing outlook*, 55(3), pp.144-150.
- Braun, V. and Clarke, V., (2020). One size fits all? What counts as quality practice in (reflexive) thematic analysis?. *Qualitative research in psychology*, pp.1-25.
- Briggs-Kamara, M. A., Okoye, P. C., & Omubo-Pepple, V. B. (2013). Radiation safety awareness among patients and radiographers in three hospitals in Port Harcourt. *Am J Sci Ind Res*, 4(1), 83-8.
- Brittain, S., Ibbett, H., de Lange, E., Dorward, L., Hoyte, S., Marino, A., Milner-Gulland, E.J., Newth, J., Rakotonarivo, S., Verissimo, D. and Lewis, J., (2020). Ethical considerations when conservation research involves people. *Conservation Biology*, 34(4), pp.925-933.
- Castle, A. (2009) 'Defining and assessing critical thinking skills for student radiographers', *Radiography*, 15(1), pp. 70-76. doi: 10.1016/j.radi.2007.10.007.
- Castle, A. (2006) 'Assessment of the critical thinking skills of student radiographers', *Radiography*, 12(2), pp. 88-95. doi: 10.1016/j.radi.2005.03.004.

- Castleberry, A., Nolen, A. and Castleberry, A. (2018) *'Thematic analysis of qualitative research data: Is it as easy as it sounds?'*, *Currents in pharmacy teaching & learning*, 10(6), pp. 807-815. doi: 10.1016/j.cptl.2018.03.019.
- Chau, M., (2020). Cultural Diversity and the Importance of Communication, Cultural Competence, and Uncertainty in Radiography. *Journal of Medical Imaging and Radiation Sciences*.
- Chambers, C.E., Eisenhauer, M.D., McNicol, L.B., Block, P.C., Phillips, W.J., Dehmer, G.J., Heupler, F.A. and Blankenship, J.C., (2006). Infection control guidelines for the cardiac catheterization laboratory: society guidelines revisited. *Catheterization and Cardiovascular Interventions*, 67(1), pp.78-86.
- Charmaz, K., (2014). *Constructing Grounded Theory 2nd Edition* Sage Publications: Thousand Oaks.
- Chapman, N., Dempsey, S.E. and Warren-Forward, H.M. (2009) 'Workplace diaries promoting reflective practice in radiation therapy, *Radiography*, 15(2), pp. 166-170. doi: 10.1016/j.radi.2008.04.008.
- Christensen, B.M., Nilsson, S. and Stensson, M., (2020). Developing communication support for interaction with children during acute radiographic procedures. *Radiography*, 26(2), pp.96-101.
- Cockbain, M.M., Blyth, C.M., Bovill, C. and Morss, K. (2009) 'Adopting a blended approach to learning: Experiences from Radiography at Queen Margaret University, Edinburgh', *Radiography*, 15(3), pp. 242-246. doi: 10.1016/j.radi.2008.08.001.
- Corbin, J. and Strauss, A., (2008). Theoretical sampling. *Basics of qualitative research (3rd ed.)*: *Techniques and procedures for developing grounded theory*, pp.143-159.

Costley, C., Elliott, G. and Gibbs, P., (2010). Research Ethics and Insider-Researchers. *Costley, C., Elliott, G., & Gibbs, P.(2010) Doing work based research: Approaches to enquiry for insider-researchers*, pp.25-35.

Couto, J. G., McFadden, S., McClure, P., Bezzina, P., & Hughes, C. (2020). Competencies of therapeutic radiographers working in the linear accelerator across Europe: a systematic search of the literature and thematic analysis. *Radiography*, 26(1), 82-91.

Decker, S. and Iphofen, R. (2005) 'Developing the profession of radiography: Making use of oral history', *Radiography*, 11(4), pp. 262-271. doi: 10.1016/j.radi.2005.01.009.

Easton, S., (2009). An Introduction to Radiography E-Book. Elsevier Health Sciences.

Ebrahim, S. and Bowling, A. eds., (2005). *Handbook of health research methods: investigation, measurement and analysis*. McGraw-Hill Education (UK).

Eddy, A. (2010) 'Work-based learning and role extension: A match made in heaven?', *Radiography*, 16(2), pp. 95-100. doi: 10.1016/j.radi.2009.12.001.

Edwards, R. and Holland, J., (2013). *What is qualitative interviewing?*. A&C Black.

Ehrlich, R.A. and Coakes, D.M., (2016). Patient care in radiography-e-book: with an introduction to medical imaging. Elsevier Health Sciences

Fatahi, N., Mattsson, B., Lundgren, S.M. and Hellström, M. (2010) 'Nurse radiographers' experiences of communication with patients who do not speak the native language', *Journal of advanced nursing*, 66(4), pp. 774-783.

- Field, L. and Snaith, B.A. (2013) 'Developing radiographer roles in the context of advanced and consultant practice', *Journal of Medical Radiation Sciences*, 60(1), pp. 11-15. doi: 10.1002/jmrs.2.
- Forte, A. and Fowler, P. (2009) 'Participation in interprofessional education: An evaluation of student and staff experiences', *Journal of Interprofessional Care*, 23(1), pp. 58-66. doi: 10.1080/13561820802551874.
- Gaskell, L. and Beaton, S. (2010) 'Inter-professional work-based learning within an MSc in Advanced Practice: Lessons from one UK higher education programme', *Nurse Education in Practice*, 10(5), pp. 274-278. doi: 10.1016/j.nepr.2009.11.017.
- Gerrish, K. and Lacey, A., (2006). Communicating and disseminating research. *The research process in Nursing*, 5, pp.477-490.
- Gidman, J. (2013) 'Listening to stories: Valuing knowledge from patient experience', *Nurse Education in Practice*, 13(3), pp. 192-196. doi: 10.1016/j.nepr.2012.09.006.
- Gloster, A. and Ganley, L. (2012) 'Care of patients with minor injuries', *Nursing Standard* (through 2013), 26(21), pp. 50-7; quiz 58. doi: 10.7748/ns2012.01.26.21.50.c8886.
- Gordon, F. and Ward, K. (2005) 'Making it Real: Interprofessional Teaching Strategies in Practice', *Journal of Integrated Care*, 13(5), pp. 42-47. doi: 10.1108/14769018200500040.
- Weller, G., (2012). Doing work-based research: approaches to enquiry for insider researchers.
- Guest, G., Namey, E. and Chen, M., (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS One*, 15(5), pp,76.

- Gunn, V. and Owen, M. (2010) 'Enhancing the quality of workplace interaction through reflective engagement with clinical audit', *Reflective Practice*, 11(1), pp. 95-106. doi: 10.1080/14623940903500093.
- Hamilton, J. and Druva, R. (2010) 'Fostering appropriate reflective learning in an undergraduate radiography course', *Radiography*, 16(4), pp. 339-345. doi: 10.1016/j.radi.2010.03.005.
- Hardy, M. and Snaith, B. (2006) 'Role extension and role advancement – Is there a difference? A discussion paper', *Radiography*, 12(4), pp. 327-331. doi: 10.1016/j.radi.2005.09.004.
- Hellman, E. and Lindgren, M., (2014). Radiographers' perceptions of patients care needs during a computed tomography examination. *Journal of Radiology Nursing*, 33(4), pp.206-213.
- Hussain, Z., Pickering, V., Percy, D., Crane, J. and Bogg, J. (2011) 'An analysis of the experiences of radiography and radiotherapy students who are carers at one UK university', *Radiography*, 17(1), pp. 49-54. doi: 10.1016/j.radi.2010.08.006.
- Justino, H. (2006) 'The ALARA concept in pediatric cardiac catheterization: techniques and tactics for managing radiation dose', *Pediatric radiology*, 36(2), pp. 146-53. doi: 10.1007/s00247-006-0194-2.
- Kelley, A. and Aston, L. (2011) 'An evaluation of using champions to enhance inter-professional learning in the practice setting', *Nurse Education in Practice*, 11(1), pp. 36-40. doi: 10.1016/j.nepr.2010.06.003.
- Kossmann, S.P. and Scheidenhelm, S.L., (2008). Nurses' perceptions of the impact of electronic health records on work and patient outcomes. *CIN: Computers, Informatics, Nursing*, 26(2), pp.69-77.
- Kuon, E., (2008). Radiation exposure in invasive cardiology. *Heart*, 94(5), pp.667-674.
- Lange, R.A. and Hillis, L.D., (2003). Diagnostic cardiac catheterization. *Circulation*, 107(17), pp.e111-e113.

- Larsson, W., Lundberg, N. and Hillergård, K. (2009) 'Use your good judgement – Radiographers' knowledge in image production work', *Radiography*, 15(3), pp. e11-e21. doi: 10.1016/j.radi.2008.09.003.
- Lewis, R. A., Hall, C. J., Hufton, A. P., Evans, S., Menk, R. H., Arfelli, F., ... & Rogers, K. D. (2003). X-ray refraction effects: application to the imaging of biological tissues. *The British journal of radiology*, 76(905), 301-308.
- Lindsay, A., Bishop, J., Harron, K., Davies, S. and Haxby, E. (2018) 'Use of a safe procedure checklist in the cardiac catheterization laboratory', *BMJ Open Quality*, 7(3). doi: 10.1136/bmj-oq-2017-000074.
- Mackay, S.J., Hogg, P., Cooke, G., Baker, R.D. and Dawkes, T. (2012) 'A UK-wide analysis of trait emotional intelligence within the radiography profession', *Radiography*, 18(3), pp. 166-171. doi: 10.1016/j.radi.2011.11.009.
- Marshall, G. (2008) 'Promoting independent learning by curriculum design and assessment in a taught postgraduate MRI programme', *Radiography*, 14(3), pp. 238-245. doi: 10.1016/j.radi.2006.11.001.
- Mayo, J. and Gin, K. (2010) 'Cardiac Computed Tomography: A Team Approach?', *Canadian Association of Radiologists Journal*, 61(2), pp. 67. doi: 10.1016/j.carj.2010.02.004.
- Maxwell, J.A., (2008). Designing a qualitative study. *The SAGE handbook of applied social research methods*, 2, pp.214-253.
- Mc Inerney, J. and Baird, M. (2016) 'Developing critical practitioners: A review of teaching methods in the Bachelor of Radiography and Medical Imaging', *Radiography*, 22(1), pp. e40-e53. doi: 10.1016/j.radi.2015.07.001.

Meads, G. & Ashcroft, J. With, Barr, H, Scott, R. & Wild, A. ( 2005) The case for interprofessional collaboration in health and social care. Oxford, Blackwell Publishing.

Mercuri, M., Sheth, T. and Natarajan, M. (2011) 'Radiation exposure from medical imaging: A silent harm?', *Canadian Medical Association Journal*, 183(4), pp. 413-4. doi: 10.1503/cmaj.101885.

Milburn, P.C. and Colyer, H. (2008) 'Professional knowledge and interprofessional practice', *Radiography*, 14(4), pp. 318-322. doi: 10.1016/j.radi.2007.09.003.

Mohammadi, M., Danaee, L. and Alizadeh, E., (2017). Reduction of radiation risk to interventional cardiologists and patients during angiography and coronary angioplasty. *The Journal of Tehran University Heart Center*, 12(3), p.101.

Murphy, F., (2001). Understanding the humanistic interaction with medical imaging technology. *Radiography*, 7(3), pp.193-201.

Naylor, S., Ferris, C. and Burton, M. (2016) 'Exploring the transition from student to practitioner in diagnostic radiography', *Radiography*, 22(2), pp. 131-136. doi: 10.1016/j.radi.2015.09.006.

Ng, C.K.C. and White, P. (2005) 'Qualitative research design and approaches in radiography', *Radiography*, 11(3), pp. 217-225. doi: 10.1016/j.radi.2005.03.006.

Ng, C.K.C., White, P. and McKay, J.C. (2008) 'Establishing a method to support academic and professional competence throughout an undergraduate radiography programme', *Radiography*, 14(3), pp. 255-264. doi: 10.1016/j.radi.2007.05.003.

Nickerson, C.J. and Thurkettle, M.A. (2013) 'Cognitive Maturity and Readiness for Evidence-Based Nursing Practice', *Journal of Nursing Education*, 52(1), pp. 17-23. doi: 10.3928/01484834-20121121-04.



Nightingale, J. (2008) 'Developing protocols for advanced and consultant practice', *Radiography*, 14(1), pp. e55-e60. doi: 10.1016/j.radi.2008.04.001.

Norouzinia, R., Aghabarari, M., Shiri, M., Karimi, M. and Samami, E. (2016) 'Communication barriers perceived by nurses and patients', *Global journal of health science*, 8(6), pp. 65.

O'Toole, G. (2020) *Communication-eBook: Core Interpersonal Skills for Healthcare Professionals*. Elsevier Health Sciences.

Panchbhai, A. (2015) 'Wilhelm Conrad Röntgen and the discovery of X-rays: Revisited after centennial', *Journal of Indian Academy of Oral Medicine and Radiology*, 27(1), pp. 90–95. doi: 10.4103/0972-1363.167119.

Parahoo K (2006) *Nursing Research: Principles, Process and Issues*. 2nd edn. Palgrave Macmillan, London

Pollard, N., Lincoln, M., Nisbet, G., Penman, M. and Pollard, N. (2019) 'Patient perceptions of communication with diagnostic radiographers', *Radiography* (London, England : 1995), 25(4), pp. 333-338. doi: 10.1016/j.radi.2019.04.002.

Puzey, C. and Kealey, A., (2016). *Anaphylaxis in the Cardiac Cath Lab: A True Emergency*. *Canadian Journal of Cardiology*, 32(10), p.S315.

Rauch, S.L., Shin, L.M. and Wright, C.I., (2003). Neuroimaging studies of amygdala function in anxiety disorders. *Annals of the New York Academy of Sciences*, 985(1), pp.389-410.

Rejnö, Å., Berg, L. and Danielson, E., (2014). The narrative structure as a way to gain insight into peoples' experiences: One methodological approach. *Scandinavian Journal of Caring Sciences*, 28(3), pp.618-626.

Reeves, P., Wright, C., Shelley, S. and Williams, P. (2004) 'The Society of Radiographers' research strategy', *Radiography*, 10(3), pp. 229-233. doi: 10.1016/j.radi.2004.03.010.

Reid, K. and Edwards, H. (2011) 'Evaluating the role of the diagnostic research radiographer', *Radiography*, 17(3), pp. 207-211. doi: 10.1016/j.radi.2011.02.004.

Sandelowski, M.J., (2008). Justifying qualitative research.

Shrader, S., Kern, D., Zoller, J. and Blue, A. (2013) 'Interprofessional Teamwork Skills as Predictors of Clinical Outcomes in a Simulated Healthcare Setting', *Journal of allied health*, 42(1), pp. 1.

Strobbe, A., Adriaenssens, T., Bennett, J., Dubois, C., Desmet, W., McCutcheon, K., Van Cleemput, J. and Sinnaeve, P.R., (2017). Etiology and long-term outcome of patients undergoing pericardiocentesis. *Journal of the American Heart Association*, 6(12), p.e007598.

Shoja, M., Soleimani, M., Ameriyan, M., Asbaghipour, N. and Hejazi, P.H., (2019). Evaluation of radiation protection principles and 10-day rule observance for women prone to pregnancy: brief report. *Tehran University Medical Journal TUMS Publications*, 77(2), pp.132-136.

Sim, J. and Radloff, A. (2009) 'Profession and professionalisation in medical radiation science as an emergent profession', *Radiography*, 15(3), pp. 203-208. doi: 10.1016/j.radi.2008.05.001.

Smith, T. and Jones, P., (2007). Remote x-ray operator radiography: a case study in interprofessional rural clinical practice. *Journal of interprofessional care*, 21(3), pp.289-302.

Snaith, B. and Hardy, M. (2007) 'How to achieve advanced practitioner status: A discussion paper', *Radiography*, 13(2), pp. 142-146. doi: 10.1016/j.radi.2006.01.001.

Stewart, I., (2013). *Transactional analysis counselling in action*. Sage.

Steven, A., Dickinson, C. and Pearson, P. (2007) 'Practice-based interprofessional education: Looking into the black box', *Journal of Interprofessional Care*, 21(3), pp. 251-264. doi: 10.1080/13561820701243664.

Strickland, N. (2015) 'Quality assurance in radiology: peer review and peer feedback', *Clinical radiology; Clin.Radiol.*, 70(11), pp. 1158-1164. doi: 10.1016/j.crad.2015.06.091.

Teusner, A., (2016). Insider research, validity issues, and the OHS professional: One person's journey. *International Journal of Social Research Methodology*, 19(1), pp.85-96.

Tierney, S., Seers, K., Tutton, E. and Reeve, J., (2017). Enabling the flow of compassionate care: a grounded theory study. *BMC Health Services Research*, 17(1), pp.1-12

Vaismoradi, M. and Snelgrove, S., (2019). September. Theme in qualitative content analysis and thematic analysis. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 20, No. 3).

Waite, S., Scott, J., Drexler, I., Martino, J., Legasto, A., Gale, B. and Kolla, S. (2018) 'Communication errors in radiology - Pitfalls and how to avoid them', *Clinical imaging; Clin.Imaging*, 51, pp. 266-272. doi: 10.1016/j.clinimag.2018.05.025.

Weller, G. (2012) *Doing work based research: approaches to enquiry for insider researchers* ROUTLEDGE JOURNALS, TAYLOR & FRANCIS LTD.

White, N. (2006) '*Reflective practice in radiography education*', *RADIOTHERAPY AND ONCOLOGY*, 81, pp. S88.

Windover, A.K., Boissy, A., Rice, T.W., Gilligan, T., Velez, V.J. and Merlino, J. (2014) 'The REDE Model of Healthcare Communication: Optimizing Relationship as a Therapeutic Agent', *Journal of Patient Experience*, 1(1), pp. 8-13. doi: 10.1177/237437431400100103.

Yielder, J. and Davis, M. (2009) 'Where radiographers fear to tread: Resistance and apathy in radiography practice', *Radiography*, 15(4), pp. 345-350. doi: 10.1016/j.radi.2009.07.002.

Younger, C.W.E., Douglas, C. and Warren-Forward, H., (2018). Medical imaging and informed consent—Can radiographers and patients agree upon a realistic best practice?. *Radiography*, 24(3), pp.204-210.

## Chapter 9: Appendix.

### **SPICE Model**

Gerrish, K. and Lacey, A. (2006) *The Research Process in Nursing*. 5<sup>th</sup> edn. Oxford: Blackwell Publishing Ltd. pp. 96.

<b>Setting</b>	Communication and Interactions
<b>Perspective</b>	Cardiac Radiographers and patients in the cardiac catheterization laboratory.
<b>Intervention</b>	Cardiac Radiographer role
<b>Comparison</b>	Professional Prospective to patients.
<b>Evaluation</b>	Barriers, Problems, Challenges

## Appendix 2.

### Database Search Tables

**Database:** Cumulative Index to Nursing and Allied Health Literature.

**Limits applied:** 2012-2019 / Research.

<b>Search number/ Boolean operator 'and'</b>	<b>DataBases and Search Engines.</b>	<b>Subject heading</b>	<b>Results</b>
2	ELSEVIER	Communication and Cardiac Radiography	58,682
4	MEDLINE	Radiography and communication	2081
6	UNI LIBRARY	Cardiac Radiography role	850
8	ScienceDirect	Communication and interaction in cardiology	3371
10	OVID		3372
12	CINAHL	communication barriers / patients' care in radiography	34905
2 'and' 4			46
2 'and' 6			10
2 'and' 8			38
2 'and' 10			21
2, 6 'and' 10			2
2, 8 'and' 10			3
2, 10 'and' 12			0
2, 6 'and' 12			4
6 'and' 10			76

### Appendix 3.

**Table 2.**

<b>Participants Demographic Characteristics.</b>		
Number of Participants.	12	
Gender	<b><u>Female</u></b> 4	<b><u>Male</u></b> 8
Employment Type.	NHS Staff	6
	Locum Staff	6
Years of Experiences.	1-25 years	
Years of Degree Training.	BSc (Hons) Diagnostic Radiography.	
Year/Months of Cardiac Speciality Training.	7 Months to a Year.	

## Appendix 4.

Middlesex University School of Health and Education Health and Social Care Ethics Sub-Committee.



Health and Social Care Sub-Committee

The Burroughs  
Hendon  
London NW4 4BT

Main Switchboard: 0208 411 5000

09/09/2019

**APPLICATION NUMBER:** 5133

Dear Cabdiraxmaan Aakhiro and all collaborators/co-investigators

**Re your application title:** RADICOM

**Supervisors:** Catherine Kerr, Gordon Weller

**Co-investigators/collaborators:**

Thank you for submitting your application. I can confirm that your application has been given APPROVAL from the date of this letter by the Health and Social Care Ethics Sub-Committee.

The following documents have been reviewed and approved as part of this research ethics application:

Document Type	File Name	Date	Version
Permission/Agreement Letter	Letter of Permission-Anita	20/12/2018	1.1
Participant Information Sheet	(PIS) Version 1.2	08/06/2019	1.2
Participant Information Sheet	CONSENT FORM Version 2.0	23/07/2019	2.0
Resubmission Response to Feedback Summary	Resubmission Feedback Summary Version 2.0	25/07/2019	2.0
Data Protection Act checklist	Middlesex University Data Protection Checklist version 2.1	04/08/2019	2.1

Although your application has been approved, the reviewers of your application may have made some useful comments on your application. Please look at your online application again to check whether the reviewers have added any comments for you to look at.

Also, please note the following:

1. Please ensure that you contact your supervisor/research ethics committee (REC) if any changes are made to the research project which could affect your ethics approval. There is an Amendment sub-form on MORE that can be completed and submitted to your REC for further review.
2. You must notify your supervisor/REC if there is a breach in data protection management or any issues that arise that may lead to a health and safety concern or conflict of interests.
3. If you require more time to complete your research, i.e., beyond the date specified in your application, please complete the Extension sub-form on MORE and submit it your REC for review.
4. Please quote the application number in any correspondence.
5. It is important that you retain this document as evidence of research ethics approval, as it may be required for submission to external bodies (e.g., NHS, grant awarding bodies) or as part of your research report, dissemination (e.g., journal articles) and data management plan.
6. Also, please forward any other information that would be helpful in enhancing our application form and procedures - please contact MOREsupport@mdx.ac.uk to provide feedback.

Good luck with your research.



**Appendix 5.**

**MIDDLESEX UNIVERSITY**

**PARTICIPANT SHEET (PIS)**

Participant ID Code.....

**SECTION 1**

**1. Study title**

How can Radiographers' and patient Interactions and communications in the cardiac catheter laboratory be improved?

**2. Invitation paragraph**

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part. If at any point you have questions about the study, you are free to ask. The Interview will last approximately 20-40 minutes. All the information collected will be anonymous and considered confidential.

The project will safeguard all participants from exposure and participant's details will remain anonymous.

Thank you for reading this.

**3. What is the purpose of the study?**

This research aims to explore the radiographer's communication and interactions with patients that are admitted to the cardiac catheter laboratory. The research will explore patient care pathways prior to and post coronary cardiac catheterization procedures. The research will also explore the concept of patient care in interventional cardiac imaging and the communication methods used by cardiac radiology professionals.

#### **4. Why have I been chosen?**

It is important that we assess as many participants as possible, and you have indicated that you are interested in taking part in this study. You have been chosen because you are a qualified Cardiac Interventional Radiographer. This research project will be excluded from non-cardiac radiographers and there will be 15 to 20 participants.

#### **5. Do I have to take part?**

It is up to you to decide whether to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. If you do decide to withdraw from the study then please inform the researcher as soon as possible, and they will facilitate your withdrawal. If, for any reason, you wish to withdraw your data please contact the researcher within a month of your participation. After this data, it may not be possible to withdraw your data as the results may have already been published. However, as all data are anonymized, your data will not be identifiable in any way.

#### **6. What will I have to do?**

If you decide to take part in this research. You will be invited to attend an interview to discuss your professional practice concerning cardiac radiographers' and patient interactions and communications in the cardiac catheterization laboratory. I will ask you about practices you use in relation to your role as a radiographer.

The interview will take between 20-40 minutes and it will be conducted at a confidential venue. The data will then be coded and analysed individually. Your responsibility is to collaborate and be open

and honest. There are no pressures on you, and you can stop the interview at any time. You have a right to withdraw at any time without a reason.

**7. Will I have to provide any bodily samples (i.e. blood/saliva/urine)? No.**

**8. What are the possible disadvantages and risks of taking part?**

The research study has no known risks in participating in this project. Contributing your time could be viewed as a disadvantage.

**9. What are the possible benefits of taking part?**

There is no personal benefit of taking part in this research. However, this study aims to contribute an understanding and evaluating of the radiographers' communication and interactions in the cardiac catheter laboratory, and it will be contributing the best ways of engaging with our patients.

**10. Will my taking part in this study be kept confidential?**

The research team has put several procedures in place to protect the confidentiality of participants. You will be allocated a participant code that will always be used to identify any data you provide. Your name or other personal details will not be associated with your data, for example, the consent form that you sign will be kept separate from your data. All paper records will be stored in a locked filing cabinet, accessible only to the research team, and all electronic data will be stored on a password-protected computer. All information you provide will be treated under the UK Data Protection Act. Please see the participant privacy notice in section 2.

**11. What will happen to the results of the research study?**

The results of the research study will be used as part of a Postgraduate dissertation. The results may also be presented at conferences or in journal articles. However, the data will only be used by members of the research team, and at no point will your personal information or data be revealed.

**12. Who has reviewed the study?**

The study has received full ethical clearance from the Research ethics committee who reviewed the study. The committee is the Health and Social Care Ethics Sub-committee.

**13. Contact for further information**

If you require further information, have any questions, or would like to withdraw your data then please contact:

Researcher:

Mr Cabdi Aakhiro

Email: CA813@live.mdx.ac.uk

Supervisors.

Dr. Catherine Kerr

Email: C.Kerr@mdx.ac.uk

Tel: 02084114509

Dr. Gordon Weller

Email: g.weller@mdx.ac.uk

Tel: 02084114509.

Middlesex University

The Burroughs, Hendon,

London, NW4 4BT.

Thank you for taking part in this study. You should keep this participant information sheet as it contains your participant code, important information and the research teams contact details

## **SECTION 2**

### **Middlesex University Guide to Research Privacy Notices**

Privacy notices need to be presented whenever data is collected and should be understandable and accessible. Privacy notices must explain the type and source of data that will be processed. They will also set out the processing purpose, data retention schedules, and data sharing. Privacy notices must include details of the subject's rights and who the subject can complain to.

The following example may be used and completed for your research purposes.

### **Middlesex University Privacy Notice for Research Participants**

The General Data Protection Regulation (GDPR) protects the rights of individuals by setting out certain rules as to what organizations can and cannot do with information about people. A key element to this is the principle to process individuals' data lawfully and fairly. This means we need to provide information on how we process personal data.

The University takes its obligation under the GDPR very seriously and will always ensure personal data is collected, handled, stored, and shared securely. The University's Data Protection Policy can be accessed here:

[https://www.mdx.ac.uk/\\_\\_data/assets/pdf\\_file/0023/471326/Data-Protection-Policy-GPS4-v2.4.pdf](https://www.mdx.ac.uk/__data/assets/pdf_file/0023/471326/Data-Protection-Policy-GPS4-v2.4.pdf).

The following statements will outline what personal data we collect, how we use it, and who we share it with. It will also guide your rights and how to make a complaint to the Information Commissioner's Office (ICO), the regulator for data protection in the UK.

#### **Why are we collecting your data?**

As a university, we research part of our function and in our capacity as a teaching and research institution to advance education and learning. The specific purpose for the data collection on this occasion is to This research aims to explore the radiographer's communication and interactions with patients that are admitted to the cardiac catheter

laboratory. The research will explore patient care pathways prior to and post coronary cardiac catheterization procedures. The research will also explore the concept of patient care in interventional cardiac imaging and the communication methods used by cardiac radiology professionals.

The legal basis for processing your data under GDPR on this occasion is Article 6(1a) consent of the data subject.

### **Transferring data outside Europe**

In the majority of instances, your data will be processed by Middlesex University researchers only or in collaboration with researchers at the other UK or European institutions so will stay inside the EU and be protected by the requirements of the GDPR.

In many instances in which your data might be used as part of a collaboration with researchers based outside the EU all the necessary safeguards that are required under the GDPR for transferring data outside of the EU will be put in place. You will be informed if this is relevant to the specific study you are a participant in.

### **Your rights under data protection**

Under the GDPR and the DPA you have the following rights:

- to obtain access to, and copies of, the personal data that we hold about you;
- to require that we cease processing your data if the processing is causing you damage or distress;
- to require us to correct the personal data we hold about you if it is incorrect;
- to require us to erase your personal data;
- to require us to restrict our data processing activities;
- to receive from us the personal data we hold about you which you have provided to us, in a reasonable format specified by you, including for you transmitting that personal data to another data controller;

- to object, on grounds relating to your situation, to any of our processing activities where you feel this has a disproportionate impact on your rights.

Where Personal Information is processed as part of a research project, the extent to which these rights apply varies under the GDPR and the DPA. In particular, your rights to access, change, or move your information may be limited, as we need to manage your information in specific ways for the research to be reliable and accurate. If you withdraw from the study, we may not be able to remove the information that we have already obtained. To safeguard your rights, we will use the minimum personally identifiable information possible. The Participant Information Sheet will detail up to what point in the study data can be withdrawn.

If you submit a data protection rights request to the University, you will be informed of the decision within one month. If it is considered necessary to refuse to comply with any of your data protection rights, you also have the right to complain about our decision to the UK supervisory authority for data protection, the Information Commissioner's Office.

None of the above precludes your right to withdraw consent from participating in the research study at any time.

### **Collecting and using personal data**

All information collected from you will be kept strictly confidential. No personal sensitive information will be collected. The data will be stored in accordance with the relevant data protection legislation.

### **Data sharing.**

Your information will usually be shared within the research team conducting the project you are participating in, mainly so that they can identify you as a participant and contact you about the research project.

Responsible members of the University may also be given access to personal data used in a research project for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your records. All these people have a duty to keep your information, as a research participant, strictly confidential.

If we are working with other organisations and information is shared about you, we will inform you in the Participant Information Sheet. Information shared will be on a 'need to know' basis relative to achieving the research project's objectives, and with all appropriate safeguards in place to ensure the security of your information.

### **Storage and security.**

The University takes a robust approach to protect the information it holds with dedicated storage areas for research data with controlled access.

Alongside these technical measures, there are comprehensive and effective policies and processes in place to ensure that users and administrators of University information are aware of their obligations and responsibilities for the data they have access to. By default, people are only granted access to the information they require to perform their duties.

Training is provided to new staff joining the University and existing staff have the training and expert advice available if needed.

### **Retention**

Under the GDPR and DPA personal data collected for research purposes can be kept indefinitely, providing there is no impact to you outside the parameters of the study you have consented to take part in.

Having stated the above, the length of time for which we keep your data will depend on several factors including the importance of the data, the funding requirements, the nature of



the study, and the requirements of the publisher. Details will be given in the information sheet for each project.

### **Contact us**

The Principal Investigator leading this research is:

Mr Cabdi Aakhiro

Email: [CA813@live.mdx.ac.uk](mailto:CA813@live.mdx.ac.uk)

Telephone: 07931117679.

The University's official contact details are:

Data Protection Officer

Middlesex University

The Burroughs

London

NW4 4BT

Tel: +44 (0)20 8411 5555

Email: [dpaofficer@mdx.ac.uk](mailto:dpaofficer@mdx.ac.uk)

### **Appendix 6.**

**Project Theme: Radiographer's and patients' interactions and relationship in Cardiac Catheterization Laboratory: Radiographer's Perspectives.**

**Questionnaire:**

## About You

### 1. Your Gender

(Select only one.)

- Female
- Male

### 3. Your Role

(Select all that apply.)

- Superintendent Radiographer
- Junior Radiographer
- Senior Radiographer
- Radiographer

## Years of Experience.

### 4. How many years of experience?

(Select only one.)

- 1 year and less
- 2 or more
- 3-5 years.
- 5 or more.

### 1. HOW MANY MONTHS OF TRAINING DID YOU HAVE TO BECOME A CARDIAC INTERVENTIONAL RADIOGRAPHER?

(Select only one.)

- 1-3 Months.
- 4-6 Months
- 1 Year.
- 2 years or more.

What do you think the radiographer's role is in the cardiac catheter laboratory?

- Important
- Less Important
- Extremely Important

Please Explain Why do you think so?

Do you interact or communicate with your patients prior to their procedure at all times?

Yes  No

If No, please explain why you don't interact with them?

--

**Why it is important to interact or communicate with your patients?**

--

**How do your interactions or communications with patients look-alike compare to other professionals, i.e. cardiologists or Nurses?**

--

**What are the possible implications of interacting and communicating with your patients?**

Please list three possible reasons; -

1.

2.

3.

**How can you improve radiographers and patient interactions and communications in the cardiac catheter laboratory?**

**Do you care for your patients after the procedure?**

Yes

No

If no, why?

**Do you explain to your patients about the radiation in the cardiac catheter laboratory?**

--

<b>What do your patients feel when they come into the laboratory/or have any concerns?</b>

<b>Are your patients aware of your role within the healthcare team?</b>

<b>What do you think about inter-professional teamwork in the cardiac catheter laboratory?</b>